APPENDICES

A CONTINUATION OF

FEASIBILITY STUDY FOR THE MANUFACTURE OF ZERO GRAVITY

PHARMACEUTICALS, IMMUNOLOGICAL, AND VIRAL AGENTS

(NASA-CR-120425) FEASIBILITY STUDY FOR
THE MANUFACTURE OF ZERO GRAVITY
PHARMACEUTICALS, IMMUNOLOGICAL, AND VIRAL
AGENTS, APPENDICES (Little (Arthur D.), Inc.) 238 p HC $15.00

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Alabama 35812
NASA 29874

by

Arthur D. Little, Inc.
Cambridge, Massachusetts

August 29, 1974
APPENDIX 1

USES OF ELECTROPHORESIS IN BIOLOGY AND MEDICINE (UP TO 1970)

The first recorded use of electrophoresis in protein chemistry was the determination by Michaelis in 1909 of isoelectric points of enzymes. In 1937, Tiselius extended Michaelis' work and refined the moving boundary method of electrophoresis to separate proteins according to their electrophoretic mobility. In this method, also known as "free" electrophoresis, the motion of a boundary between a colloidal solution and the solvent is observed, usually by measuring the refractive index of the solvent along the electric field gradient. Although the technique provides an accurate measurement of electrophoretic mobility, it is difficult to use for separation for clinical or fractionation purposes. Since "free" electrophoresis operates without any supporting media, it is difficult to keep the overlapping boundaries separate; gravitational instability and convection causes mixing of the components, and instability of the moving layers results.

These problems of destabilization of separation zones has been overcome by the use of stabilizing anticonvective media. The preferred approach to stabilization is the use of solid media such as paper, powders, or especially, gels such as starch, agar, silica gel, or polyacrylamide gel. The latter gel is the most widely used medium for protein separation.

With the advent of the stabilizing gel media, the uses of electrophoresis in protein chemistry, and particularly in protein analytical chemistry, have multiplied enormously, until it has become one of the most widely used analytical tools in biochemistry.

Several excellent review articles over the past few years have illustrated the particularly wide diversity of applications to which electrophoresis has been applied, ranging from routine clinical diagnostic applications and basic research into the structure of proteins to the use of electrophoresis in the monitoring of adulteration of food products and to forensic science detection work. The review article of R. D. Strickland (Analytical Chemistry, Vol. 42, No. 5) is particularly comprehensive. In the following sub-sections we briefly survey some of the common uses of electrophoresis in biology and medicine.

A. Clinical and Diagnostic Chemistry

Electrophoretic analysis of body fluids provides a rapid and sensitive method of detecting a number of disorders.

Urinary protein patterns are useful in the diagnosis of a wide range of biochemical disorders and diseases. In cancer patients, a slow-moving
glycoprotein is characteristically present in the urine which is not found in the urine of normal patients.\textsuperscript{75} Heavy-chain immunoglobulin fragments may also accompany Bence-Jones proteins in myeloma.\textsuperscript{114} Electrophoretic detection has also been used to screen for amino acidurias and for abnormal excretion of amino acids and sugars in urine.\textsuperscript{46, 113, 147} Similarly radioiodine coupled with electrophoretic separation has been used to detect and measure picogram amounts of protein in the urine.\textsuperscript{70} Urine gamma globulin in elevated amounts is found by electrophoresis in the patients suffering from lupus-erythematosus.\textsuperscript{32}

Electrophoresis of cerebrospinal fluid has been used for the detection of multiple sclerosis;\textsuperscript{14a} in the active phase of the disease, cells from the cerebrospinal fluid have been shown to produce a unique immunoglobulin which is not found in normal subjects, nor is it found in multiple sclerosis patients during periods of remission of the disease. These findings have provided evidence that the disease is caused by autoimmunity. Other changes in electrophoretic patterns of cerebrospinal fluid proteins have also been found in glycoproteins, and the diagnostic significance of these are currently under study.

Electrophoretic separation and analysis of gastric juice proteins have shown that the albumin level of gastric juice is elevated in anemia, gastric cancer and gastritis. The distribution of proteins and microproteins in duodenal fluid have been shown to be markedly changed in patients suffering from cystic fibrosis.

Electrophoretic patterns of human serum have been used for a number of diagnostic applications. The first sign of liver cirrhosis, for example, is a rise in $\beta_{2A}$-globulin, and a new zone in the $\gamma$-globulin region of cirrhotic serum has also been shown under special applications.\textsuperscript{33, 57} In other types of liver disease, special types of hyper-$\gamma$ globulinemia have been shown to occur, and the significance of these is currently under study.\textsuperscript{16}

Electrophoretic patterns of maternal serum has been shown to differ in pre-toxemia, and periodic electrophoresis of toxemia-prone pregnant women has been used as a screening test to detect the onset of toxemia as early as possible.\textsuperscript{22} Electrophoresis has also been used to detect extremely dilute antibodies in serum, as well as dilute antigens such as gonadotropins.\textsuperscript{124} Immunoelectrophoresis has also shown abnormalities in the $\alpha$, $\gamma$, and $\beta$ globulins in the serum of children with systemic lupus erythematosus.\textsuperscript{132}

A great number of other diseases have been shown to give slightly or greatly abnormal electrophoretic patterns in serum. For example, Banti's disease (congestive splenomegaly) has been shown to display lowered albumin content, while globulins are elevated.\textsuperscript{126} Niemann-Pick's disease, a hereditary disease characterized by a set of syndromes involving the liver, spleen, lungs, nervous system, etc., results in greatly diminished levels of lipoproteins in serum. Acute tetanus
causes a great increase in α, β, and γ globulins. A number of other electrophoretic tests have been found especially useful in the diagnosis of a range of cancers. Diagnosis of myeloma and differentiation between myeloma and Waldenstrom's macroglobulinemia have relied heavily on electrophoresis. Leukemia leukocytes have been shown to have a unique antigen present, while reversal in the ratio of α to β globulin vitamin B12 binding can be detected by electrophoresis, and is used to diagnose chronic myelogenous leukemia.

Generally in many cases of cancer, significantly elevated levels of glycoprotein have been shown in the serum.

Other diseases in which abnormal patterns in serum occur include:

- **leishmaniasis** (infantile splenomegaly caused by a mediterranean parasite) in which the electrophoretic pattern shows greatly elevated IgG and slightly elevated IgA and IgM;

- **typhoid**, in which carriers have been shown to be notably low in IgM and high in IgG;

- **ulcerative colitis**, in which α1 and α2 proteins have been shown to be elevated, and cryoproteins containing IgG and IgM have been shown to be present and a variety of other common and obscure diseases.

Electrophoresis has been extensively used for the detection of genetic and disease-induced protein abnormalities in blood, particularly hemoglobin. These include sickle-cell anemia, hemoglobins with diminished and enhanced oxygen affinities, and a variety of other hemoglobin variants which may, or may not be associated with a diseased state.

Immunoelectrophoresis of other body fluids used for diagnostic purposes includes:

- **synovial fluid**, in which haptoglobin increases have been shown to be associated with arthritis, as are abnormal distribution of the lactic dehydrogenases. Measurement of the degree of polymerization of hyaluronic acid in synovial fluid is useful for assessing the effects of anti-inflammatory drugs.

- **amniotic fluid**, in which abnormal protein distributions have been used for the detection of toxemia, some congenital fetal malformations and diabetes mellitus.
B. Protein Research

Electrophoresis is extensively used in the investigation of the properties of proteins, including a characterization of their electrical charge, their size, and their degree of homogeneity. Serum albumin, for example, has been shown to separate into two distinct components, and several poorly resolved ones, and considerable research has gone into the investigation of whether these components represent polymerization or depolymerization, and the factors affecting aggregation.

Vitamin binding studies, particularly in vitamin B₁₂, have actively employed electrophoresis. Most vitamins are bound by the α and β proteins, but albumin has been shown to transport most of the biotin, pantothenate and β-carotene.

Other proteins which have been studied include clotting factors, serum globulins, enzymes including deoxyribonucleases, glycosidases, proteases, cellulases, lactases, carbonic anhydrase, etc.

Milk proteins have been extensively studied, using electrophoresis as one of the major separating and analysis tools. Studies have shown that protein content in bovine milk varies from breed to breed and that some protein fractions may be totally lacking in some breeds of cattle. The genetics controlling the variations in milk proteins have been studied in cows, sheep, and zebus. Human milk has been shown to lack casein present in other mammal milk, while most of the other proteins found in human milk, such as albumin, lipoprotein, glycoprotein, ceruloplasmin, haptoglobin, transferrin, IgA, IgG and IgM, have been shown in cows, sows, and rats. IgA protein has been shown to be present in particularly concentrated amounts.

Electrophoresis has been used to analyze saliva proteins (parotid saliva, for example, has been shown to contain thirty different proteins) and sweat (where sixteen different plasma proteins have been shown to be present and tears (human tears have been shown to contain a specific prealbumin and an IgA that differs from that of serum).

The interactions of proteins, and complex formation has been actively studied with the aid of electrophoresis. Heparin has been shown to form complexes with gamma-globulin and thrombin, but not with albumin and fibrinogen. This has lent considerable insight into the understanding of the mechanism of this anti-coagulant in preventing clot formation. Hyaluronic acid has been shown to form a complex with serum albumin that is sufficiently stable to appear as a new electrophoretic peak. The interactions of proteins with ions has been extensively studied. For example, the competitive binding of iron with plasma proteins and chelating agents such as ethylenediaminetetraacetic acid has been studied. The iron has been shown to be removed from
the plasma protein and irreversibly bound to the EDTA. The EDTA chelating agent has been shown to bind to albumin. Fluoride in serum has been shown to be preferentially and irreversibly bound to albumin, while calcium binding to serum proteins has been shown to be an equilibrium reaction; the extent of binding depends upon both the calcium and the protein concentrations.

The field of enzymology has made particularly widespread use of electrophoresis in the isolation, purification and identification of enzymes, and a number of general reviews have been written on the subject.

In hormone identification and analysis, a technique has been developed for the separation of free and antibody bound hormones. Electrophoresis has been used to analyze the purity of hormones. Commercial preparations of insulin, for example, have been shown to have several slowly-migrating fractions. Insulin has been shown to circulate in the blood stream bound mostly to α2-globulin.

C. Detection and Analysis

(1) Food Applications

Electrophoresis has been used in the analysis of a number of commercial food applications to assess purity and protein content. The egg content of noodles can be determined electrophoretically, and the presence of egg white in commercial preparations of egg yolk can be detected. Electrophoresis is particularly useful—and has been widely used—to distinguish between species of fish in commercial products. Because the types of protein in mammalian milk have been so extensively evaluated (see above), adulteration of one milk with that from another species can be detected. Adulteration of cow milk with goat milk for example, or buffalo milk with cow milk, has been reported. Similarly, adulteration of cheeses can be detected. Classic Roguefort cheese, for example, is from sheep, while Blue cheese is from cow milk. Adulteration of Roguefort with Blue has been documented. It has been reported that Swiss cheese aging can be followed by observing the variations of its proteins.

Electrophoresis can also be used for the detection of milk protein adulteration of meat products. This is particularly common in meat by-product products such as sausage and meat patties.

Electrophoresis is useful in the analysis of cereal grain products. It has been proposed to replace the inexact "dropping number" method of evaluating bread grains, and has been used to detect the changes in barley proteins in beer fermentation.

In the wine and cider industry, electrophoresis has been used to distinguish between sparkling and carbonated wines by measurement of aspartic and glutamic acid contents and to detect apple cider adulteration of wine.
Electrophoresis has been particularly useful in the detection of toxins after autopsy. These include digitoxin, barbiturates, and other drugs. A rapid method for identifying bloodstains by immunoelectrophoresis has been developed. Sperm can be identified electrophoretically by its characteristic pattern, by confirmation of the presence of spermine, or by demonstrating the presence of lactic dehydrogenase.

Toxins such as insecticides have been detected for as long as twelve days after death.

**Pharmacology**

Electrophoresis has been used in a number of pharmacological applications to measure purity of drugs, and to separate components. It is routinely used to measure purity of plasma protein fractions such as human albumin, gamma globulin preparations, etc.

Anti-biotics such as streptomycin and its derivatives and the erythromycin derivates have been separated by electrophoresis.

In the analysis of compound medicinals, electrophoresis has proved useful for separating the salicylates, barbiturates and alkaloids.

**Botany**

Electrophoresis has been extensively used in the study of the genetics of cereal grains. Both the albumins and globulins of wheat, for example, are extremely heterogeneous; the protein patterns are related to wheat varieties, and can be used to trace the genetics of the wheat strains. Similarly, barley contains proteins which are very heterogeneous as do soybeans and other beans and peas.

Electrophoresis has also been applied to non-protein plant substances including the separation of metal-organic complexes, phosphate esters, amino acids and organic acids. It has also been used for the measurement of bound carbohydrates and other neutral fractions.

Electrophoresis has been applied to soil measurements to study such components as humic acids, iron complexes, and other metal complexes.

**Microbiology**

In microbiology, electrophoresis has been particularly useful in the measurement of different forms of DNA (deoxyribonucleic acid) and RNA (ribonucleic acid). Virus-specific RNA has been identified in cells infected with polio virus. Infection RNA has been isolated from foot-and-mouth disease virus and the virulent form of bacteriophage λ has been shown to contain less DNA than the non-virulent form.
Protein synthesis has been studied in cell cultures infected with herpes simplex, and it has been shown that the virus causes at least 25 different proteins to be synthesized.\textsuperscript{131}

Electrophoresis has been found to be useful in the classification of a variety of microorganisms including Penicillium,\textsuperscript{13} Mycoplasma,\textsuperscript{145} Phytophthora,\textsuperscript{53} etc. Enteric bacteria\textsuperscript{20} mycobacteria\textsuperscript{104} and a variety of other fungi, plants and other microorganisms have been classified with the aid of electrophoresis.

The proteins of a number of different viruses have been fractionated. These include Newcastle virus,\textsuperscript{45} herpes virus,\textsuperscript{144} vesicular stomatitis virus \textsuperscript{71, 143} tobacco mosaic virus\textsuperscript{96} and a wide variety of other viruses responsible for disease in plants, animals and man.
REFERENCES
for
APPENDIX 1

44. Elton, G. A. H., Ewart, J. A. D., Baker's Dig. 41, 36, 42 (1967).
47. Farriaux, J. P., Muller, P. H., Fontaine, G., Lille Med. 12, 687 (1967).
54. Glasnak, V., Zivocisna Vyropa 13, 335 (1968); CA 70, 35747 w.
55. Grabar, P., Nummi, M., Brew Dig. 42, 68 (1967).
61. Hoefner, W., Atti Simp. Int. Agrochin. 6, 94 (1966); CA 67, 88280h.
79. Kondo, H., Igaku to Seibutsugaku 73, 72 (1966); CA 69, 84875z.
103. Myszkowska, K., Diss. Pharm. Pharmacol. 20, 373 (1968); CA 70, 1571u.
104a. Ney, K. H., Fette, Seifen, Anstrichm. 69, 794 (1967); CA 68, 2052w.
110. Ogata, K., Rinsho Shoni Igaku 15, 56 (1967); CA 68, 37387 m.
111. Ohba, Y., Bull. Yamaguchi Med. Sch. 14, 201 (1967); CA 70, 84344w.
126. Sato, T., Uchiyama, S., Hayama, T., Koyama, K., Tohoku J. Exp. Med. 87 (1965); CA 67, 62453s.
APPENDIX 2

INDUSTRIAL RESPONSES

TO

ARTHUR D. LITTLE, INC. INQUIRY
November 1, 1973

Dr. P.A. Gempel
Arthur D. Little Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Dr. Gempel:

Your letter to Dr. Singisey concerning electrophoresis in space has been transmitted to me for reply.

We are already very much involved in designing experiments of the type you mentioned and I am working with Marshall Space Flight Center now on a possible experiment for the Soyuz-Apollo Flight in 1975.

I'm not sure what this would mean in regards to your program, but if you would like to discuss it some time please let me know.

Sincerely yours,

[Signature]

Grant H. Barlow
Molecular Biology Research

GHB/cm
Dear Mr. Gempel:

Thank you for your recent letter to Dr. Sarett regarding the NASA project you have been contracted to undertake. Dr. Sarett asked that I inform you that we will consider the information you supplied and the questions you raised at the next monthly meeting of our Research and Development Council. Since the Committee will be meeting later this month, we should be in a position to reply sometime in November.

Thank you for your interest in the Merck Sharp & Dohme Research Laboratories.

Sincerely,

Ronald A. Rosenberger
Mr. P. A. Gempel  
Arthur D. Little, Inc.  
Acorn Park  
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

Our Research and Development Council has considered the information you supplied regarding potential space projects. In order to explore several ideas in more depth, it was referred to our Basic Research area here in the Merck Sharp & Dohme Research Laboratories. Since I indicated we expected to reply sometime in November, I am writing to let you know that it will probably be several more weeks before we will be in a position to provide a definitive reply and that Dr. David P. Jacobus, our Vice President for Basic Research or one of his colleagues will be writing you directly.

Sincerely,

Ronald A. Rosenberger
Mr. P. A. Gempel  
Arthur D. Little, Inc.  
Acorn Park  
Cambridge, Massachusetts 02140  

Dear Mr. Gempel:

This letter is to follow up your letter of 17 October 1973 to Dr. L. H. Sarett and Mr. R. A. Rosenberger's acknowledgement dated 22 October 1973.

You have asked us to identify a substance of potential importance which would be best isolated using electrophoresis under zero-gravity conditions. At present, we are not able to suggest a substance that has not yielded to examination using terrestrial techniques. The problem is made more difficult for us because we believe that a system equivalent to zero gravity can be achieved in an ultracentrifuge using diffusion across an equilibrium boundary. Such a system could then be subjected (we have not) to electrophoresis.

There are two other areas which might be of potential interest for an experiment in space if they have not already been adequately explored.

The rapid and profound demineralization is apparently comparable to the demineralization seen in fracture immobilization and in prolonged bed rest. On earth these changes take place so slowly that the factors affecting the demineralization have never been properly identified. The non-exercise situation in space might provide a sufficient change in the levels of the factors involved (calcitonin, somatomedin, growth hormone, vitamin D, etc.) so that the non-exercise situation could be unravelled.
The second area in which I suspect the Space Agency has done work deals with the examination of the circadian rhythm since the astronauts are undoubtedly on a special space schedule. Following the pattern of their biological clock by different metabolites in the urine might provide an insight into normal circadian rhythms as well as perhaps assist in developing appropriate schedules for future flights.

Please let us know if we can be of further assistance.

Sincerely yours,

DPJ:ht

David P. Jacobus
Dear Dr. Gempel:

Thank you for your letter of October 17, regarding the interest of NASA to study the potential benefits to mankind of isolating or purifying biochemical, immunological or viral agents in space. Your correspondence has been circulated to members of our research staff, but I regret that we are unable to suggest any appropriate experimentation.

Sincerely yours,

Ira Ringler
Director of Research

IR:cam
October 19, 1973

Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Mass. 02140

Dear Mr. Gempel:

Thank you for your letter of October 17th in which you describe the substance of your contract with the National Aeronautics and Space Administration to study certain operations in space.

I have forwarded copies of your letter to our Research and Development administrators who will discuss your interests with others of their staffs to see whether there are some projects or experiments that could be suggested to you.

Thank you for your interest.

Sincerely,

C. J. Cavallito

CJC:chh

cc:  R. Deghenghi
     S. M. Olin
November 27, 1973

Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

Thank you for your letter of October 17, 1973 in reference to your program to study the potential benefits to mankind for isolating or purifying biochemical, immunological, or viral agents in space. We appreciate your extending to Dow the opportunity to participate in this program, but after examination of all our projects, we do not have one which we feel would qualify at this time for this program. If, in the future, we do have something suitable, we will contact you.

Thank you again for your consideration.

Sincerely,

Anton J. Schwarz, M.D.
Director of Biological Research and Development

AJS/jw
Mr. P. A. Gempel  
Arthur D. Little, Inc.  
Acorn Park  
Cambridge, Massachusetts 02140  

Dear Mr. Gempel:  

Your letter dated October 17, 1973 to Dr. Cronk was referred to me for reply. I took the liberty of discussing the programs which you have under contract with the National Aeronautics and Space Administration with a few of my Division Directors and, although they were intrigued with the scope of the work, they failed to see how we could contribute to the project. I must, therefore, respectfully decline your offer to work with us.  

We do thank you, however, for thinking of Ortho.

Sincerely,

John P. DaVanzo, Ph.D.  
Executive Director of Research  
Basic Sciences

JPD:v
November 7, 1973

Mr. P. A. Gempel  
Arthur D. Little, Inc.  
Acorn Park  
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

Thank you for your October 17 letter regarding electrophoretic studies under conditions of "zero g". There are no such studies which I have in mind at the present point; hence, I have no suggestions.

However, it has occurred to me that perhaps some of my associates at the Rohm and Haas Company may have some experiments in mind, and I am taking the liberty of forwarding a copy of your letter to them. Should there be any interest on their part, they will take the initiative in contacting you separately.

I found the proposal in your letter quite interesting and very much appreciated hearing from you.

Sincerely yours,

Sam Gusman, Ph.D.
Ms. Pat A. Gempel  
Arthur D. Little, Inc.  
Acorn Park  
Cambridge, Massachusetts 02140

Dear Ms. Gempel:

I have consulted with the Manager of my unit, Dr. E. S. Gerard, and have been advised that company policy has been developed to deal with contract research. Higher management decides which concepts could be developed within the framework of the Corporation and which concepts would be best developed outside of our immediate resources.

A great number of applications of electrophoretic techniques can be cited as beneficial to mankind. My contribution to such a program would first need to be funneled through the channels; however at this point I would like to receive more information about specifics of contract relationships, and the type of consultation and guidance that you would be seeking outside of a contract relationship. A great number of clouding issues are raised by such an involvement. Clearly most efforts to solve a biological problem require the coordinated efforts of many portions of society, industry, non-profit public and private research foundations, universities and the government. I would be interested in participating in such a coordinated effort and would serve as an advocate within the company structure to try to balance profit motivation; exclusivity, legal responsibility with a cooperative venture with individual contributions and responsibilities defined. I believe that some of the fears that exist would be decreased if there was a clear understanding of the individual roles in such a venture, along with some prior legal understanding of the degree of sharing to take place in the return in investment that occurs.

I will be happy to discuss further scientific concepts upon receipt of additional information and company approval.

Sincerely,

Clifford L. Kragt, Ph.D.  
Fertility Research

CLK:mem
October 24, 1973

Mr. P. A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Mr. Gempel:

I am in receipt of your letter dated October 17, 1973, to Dr. Zuber of this organization.

The potential benefit that could result from a project such as you describe is certainly tremendous and I am sure that many new avenues of research could open up even in the initial stages of the project. However, this is an area in which Marion Laboratories is not involved and most likely will not be involved with in the immediate future.

We appreciate your consideration and hope the results of your work prove to be most beneficial.

Sincerely,

MARION LABORATORIES, INC.

[Signature]
Lowell D. Miller, Ph.D.
Scientific Director

LDM:pd
APPENDIX 3

MEDLAR LITERATURE SEARCH REFERENCES

(1970 - 1973)
MACRO-CELLULAR SEPARATION

10 Weiss L. Cudney TL.
Some Effects of PH and Formaldehyde on the Cellular Electrokinetic Surface
Eng. Int. J. Cancer. 4,776-84. 15 Nov 69.

16 Bert G. Lajolo Di Cossano D. Pecco P. Mazzei D.
Effect of A.L.S. and Prednisolone on the Electrophoretic Mobility of
Lymphocytes

17 Klein EE. Kurtskhaliia EG. Chogovadze IS.
Separation of Brain Proteins by Combination of the Methods of Gel Filtration
on Sephadex G-200 (on column and in a thin layer) with Electrophoresis.

166 Chrambach A. Bridson WE. Turkington RW.
Human Prolactin--Identification and Physical Characterization of the
Biologically Active Hormone by Polyacrylamide Gel Electrophoresis.

167 Pechere JF. Demaille J. Capony JP.
Muscular Parvalbumins--Preparative and Analytical Methods of General
Applicability.

168 Laycock MV. Craigie JS.
Purification and Characterization of Cytochrome 553 from the Chrysophycean
Alga Monochrysis Lutheri.

181 Seidel D.
Quantitative Lipid Electrophoresis.

183 Grasslin D. Czygan PJ. Weise HC.
Preparation of Highly Purified HCG Controlled by Gel Isoelectric Focussing.

184 Page M.
Demonstration of the Microheterogeneity of Fetuin by Electrofocusing.

185 Kisaki H. Mizuguchi R.
Electrophoresis of Glycoprotein on Cellulose Acetate Membrane.

191 Inouye M.
Internal Standards for Molecular Weight Determinations of Proteins by
Polyacrylamide Gel Electrophoresis. Applications to Envelope Proteins
of Escherichia Coli.
Stahn R. Maier KP. Hannig K.
A New Method for the Preparation of Rat Liver Lysosomes. Separation of Cell Organelles of Rat Liver by Carrier-Free Continuous Electrophoresis.

Stancek D. Paucker K.
Preparative Electrophoresis of Isotopically Labeled L-Cell Interferons.

Urasawa S. Urasawa T. Kanamitsu M.
Radioimmunoelectrophoretic Identification of Poliovirus Inhibitors and Their Characteristic Mode of Action.

Forsgren M.
Immuno-electrophoresis of Poliovirus Antigens.

Good AH. Ceverha BB.
Immunologic Assays for Identifying Single Components in Protein Mixtures after Isoelectric Focusing in Urea-Containing Acrylamide Gels.

Caspary EA.
Lymphocyte-Antigen Interaction in Electrophoretic Mobility Test for Cellular Sensitization.

Jackson RL. Lovenberg W.
Isolation and Characterization of Multiple Forms of Hydroxyindole-O-Methyltransferase.

Porembska Z. Jachimowicz J. Gasiorowska I.
Arginase Isoenzymes in Electrophoresis.

Schlesinger D.
Determination of GC Types by Starch-Gel Electrophoresis.

Wellings FM. Sather GE. Hammon WM.
Immunoelectrophoretic Studies of the California Encephalitis Virus Group.

Li TS. Shulman S.
Immunoelectrophoretic Analysis of Human Seminal Plasma Fractions after Fractionation by Various Methods.

Amberson WR. Bauer AG.
Electrophoretic Studies of Muscle Proteins. II. Complex Formation between Delta Protein, Myogen and Myosin.
MACRO-CELLULAR SEPARATION

222 Pyrovolakis J. Hatzicannou J. Gardikas C. 
Modification of the Electrophoretic Separation of Lipoproteins on Paper. 

225 Doerr P. Chrambach A. 
Anti-Estradiol Antibodies--Isoelectric Focusing in Polyacrylamide Gel. 

227 Grula EA. Savoy CF. 
A Detergent-Polyacrylamide Gel System for Electrophoretic Resolution of 
Membrane and Wall Proteins. 

228 Kawauchi S. Iwanaga S. Samejima Y. Suzuki T. 
Isolation and Characterization of Two Phospholipase A's From the Venom 
of Agkistrodon Lays Blomhoffii. 
Eng. Biochim Biophys Acta. 236,142-60. 27 Apr 71.

230 Neuwelt E. Stumpf D. Austin J. Kohler P. 
A Monospecific Antibody to Human Sulfatase A. Preparation, Characterization 
and Significance. 

231 Bert G. 
Some Applications of the Cell Electrophoresis Technique to the Study of 
the Lymphocytes. . 

233 Ikeda A. Langman J. 
Electrophoretic Analysis of Muscle Proteins. 

234 Winterhoff D. Drewitz B. 
Method of Electrophoresis of 10MG Liver Tissue on Cellulose Acetate Strips. 

236 Barrollier J. Busse V. 
Combined Electrophoretic Separation of Proteins and Carbohydrates on 
One Strip. 

237 Friesen AD. Jamieson JC. Ashton PE. 
Effect of Nonionic Detergent on Fractionation of Proteins by Isoelectric 
Focusing. 
Eng. Anal Biochem. 41,149-57. May 71.

239 Fernandez-Sorensen A. Carlson DM. 
Purification and Properties of Phosphoacetylglucosamine Mutase. 
MACRO-CELLULAR SEPARATION


MACRO-CELLULAR SEPARATION


MACRO-CELLULAR SEPARATION


<table>
<thead>
<tr>
<th>No.</th>
<th>Authors</th>
<th>Title</th>
<th>Journal/Information</th>
</tr>
</thead>
</table>


MACRO-CELLULAR SEPARATION

501 Lesnaw JA, Reichmann ME.
Determination of Molecular Weights of Plant Viral Protein Subunits by Polyacrylamide Gel Electrophoresis.

503 Winters WD, Brownstone A, Pereira HG.
Separation of Adenovirus Penton Base Antigen by Preparative Gel Electrophoresis.

505 Chepulis GK, Zhdanov VM.
Cellular Antigens in Myxo- and Paramyxoviruses as Revealed by Immuno-diffusion Methods.

506 Stocker K, Straub PW.
Rapid Detection of Fibrinopeptides by Bidimensional Paper Electrophoresis.

514 Sonneborn HH, Renninger W.
Determination of Adenosine Deaminase Gene Frequency with a New Technic.
Ger. Humangenetik. 10,188-90. 17 Sep 70.

515 Heaney A, Weller DL.
Isoelectric PH of Hemoglobin and Cytochrome C by Electrofocusing.

520 Braselton WE Jr, McShan WH.
Purification and Properties of Follicle-Stimulating and Luteinizing Hormones from Horse Pituitary Glands.

521 Bert G, DiCossano DL, Pecco P.
Capacity of Peripheral Blood Lymphocytes to Recognize a Specific Antigen. Usefulness of Cellular Electrophoresis.

523 Sakurabayashi I, Kawai T, Hasunuma S.
Fractionation of Serum Lipoproteins by Celulose-Acetate Electrophoresis with Special Reference to Clarification of Cello-Gel Membrane.

529 Gusev AI, Iazova AK.
Isolation and Purification of Human and Animal Embryo Specific Alpha-Globulins by the Method of Preparatory Disk Electrophoresis in Poly-acrylamide Gel.

530 Chowrashi PK, Chattoraj DK, Chakravarty K, Chatterjea JB.
Electrophoresis of Genetically Different Proteins in the Adsorbed State.
MACRO-CELLULAR SEPARATION


534 Pavlik I. Principles of Microbial Electrophoresis. Che. Cas Lek Cesk. 109,981-5. 9 Sep 70.


603 Gussmann S, Rames K. Separating the Polymorphous Enzymes Glutamate Pyruvate Transaminase (GPT, E.C-2.6.1.2) and Phosphoglucomutase (PGM 1, E.C-2.7.5.1) By Horizontal Starch Gel Electrophoresis in One Step. Ger. Z Rechtsmed. 70, 148-9. 1972.

104
MACRO-CELLULAR SEPARATION

604 Oranskii IE. Iuvonina LM.
Electrophoresis of Drugs in an Ultrasonic Field.

612 Koyanagi Y. Hara M. Inoue T. Goara K.
Isolation of Antigenic Component Specific for Human Seminal Plasma-
Seminoprotein (-SM) by Electrophocusing. Forensic Immunological Study
of Body Fluids and Secretions. 8.

615 Stoltz JF. Streiff F. Genetet B. Larcan A.
Demonstration of ABO Antigens on Human Lymphocytes by Means of Liquid
Phase Electrophoresis.

616 Minderhoud JM. Smith JK.
Immunological Activity of Blood Lymphocyte Fractions. A Study by the
Macrophage Electrophoretic Mobility Method.

617 Eisenstadt M. Scheinberg III.
Dielectrophoresis of Macromolecules--Determination of the Diffusion Con-
stant of Poly- -Benzyl-L-Glutamate.

620 Lever JE.
Purification and Properties of a Component of Histidine Transport in
Salmonella Typhimurium. The Histidine-Binding Protein J.

624 Mikhnno VV. Levitska GK.
Paper Electrophoresis in Analysis of Galanthamine and Securinin in
Forensic Chemistry.

630 Angeloni G. Iacobelli S. Garcea N. Paperatti L. Bompiani A.
Cervical Mucus. V. Electrophoretic Study of Proteins of Human Cervical
Mucus.

631; Tokarskaia ZB. Vedoneev VS.
Carbohydrate-Protein Relationship in Serum Electrophoretic Fractions
in Pneumonia.

633 Hultbery B. Ockerman PA.
Artificial Substrates in the Assay of Acid Glycosidases.
Gregoriades A.
Isolation of Neuraminidase from the WSN Strain of Influenza Virus.

Hayward GS.
Gel Electrophoretic Separation of the Complementary Strands of Bacteriophage DNA.

Coe JE.
A Genetic Polymorphism of Peromyscus 7S 1 Globulins- Detection by Differences in Electrophoretic Mobility.

Mori I. Asada N. Kawamura Y.
Rapid Separation of 208 TL and 207 TL from their Decay Series by Zone-Electrophoresis.

Van Kreekl Bk. Van Eijk HG. Leijnse B.
The Iso-Electric Fractionation of Rabbit Ferritin.

Waehneldt TV. Mandel P.
Isolation of Rat Brain Myelin, Monitored by Polyacrylamide Gel Electrophoresis of Dodecyl Sulfate-Extracted Proteins.

Landel AM. Aloni Y. Raftery MA. Attardi G.
Electrofocusing Analysis of Hela Cell Metaphase Chromosomes.

Zeiller K. Holzberg E. Pascher G. Hannig K.
Free Flow Electrophoretic Separation of T and B Lymphocytes. Evidence for Various Subpopulations of B Cells.

Zeiller K. Schubert JC. Walther F. Hannig K.
Free Flow Electrophoretic Separation of Bone Marrow Cells. Electrophoretic Distribution Analysis of In Vivo Colony Forming Cells in Mouse Bone Marrow.

Hultin T. Sjoqvist A.
Two-Dimensional Polyacrylamide Gel Electrophoresis of Animal Ribosomal Proteins Based on Charge Inversion.

Feldman RI. Weiner H.
Horse Liver Aldehyde Dehydrogenase. I. Purification and Characterization.
MACRO-CELLULAR SEPARATION

693 Dellinger JD, Jasper DE.
Polyacrylamide-Gel Electrophoresis of Cell Proteins of Mycoplasma Isolated from Cattle and Horses.

697 Porcelli G, Angelett M, Angeletti M, Marini-Bettolo GB.
Chromatographic and Electrophoretic Behavior of Chromogranine Obtained from Bovine and Equine Adrenal Medulla.

698 Yamada K.

721 Hashimoto N.
Isolation of Blood Cells by Electrophoresis.

723 Vasu S.
Electrophoretic Analysis of Nucleic Acids in Agarose and Polyacrylamide Gels.

726 Arnold EA, Young KE.
Isolation and Partial Electrophoretic Characterization of Total Protein from Non-Sheared Rat Liver Chromatin.
Eng. Biochim Biophys Acta. 257,482-96. 29 Feb 72.

729 Vielle-Breitburd F, Orth G.

730 Dutton GR, Barondes SH.
Macromolecular Behaviour of Gangliosides on Electrophoresis in Sodium Dodecyl Sulphate.

737 Zeiller K, Liebich HG, Hannig K.
Free-Flow Electrophoretic Separation of Lymphocytes. Two Thoracic Duct Lymphocyte Subpopulations Studied after Prolonged Cannulation and Immunization.

741 Shishido H.
Cell Electrophoresis--With Special Reference to the Antibody-Sensitized Red Cells.

744 Toneva V.
Comparative Studies of the Aujeszky Virus and the Herpes Simplex Virus with the Immunoelectrophoresis Method.
MACRO-CELLULAR SEPARATION

Field EJ. 
Delayed Hypersensitivity Studies--Some Applications of Cell Electrophoresis. 

Barengo E. Itoiz JE. 
Rapid Quantitative Evaluation of Serum LDH Isoenzyme Patterns After Agar Gel Electrophoresis. 

Lepri L. Desideri FG. Coas V. 
Chromatographic and Electrophoretic Behavior of Purines and Pyrimidines on Layers of Weak and Strong Cation Exchangers. 
Eng. J Chromatogr. 64,271-84. 2 Feb 72.

Change PC. Yano Y. Dighton M. Dickie N. 
Fractionation of Staphylococcal Enterotoxin C 2 by Isoelectric Focusing. 

Hauschild AH. Hilsheimer R. 
Purification and Characteristics of the Enterotoxin of Clostridium Perfringens Type A. 

Zeiller K. Liefich HG. Hannig K. 
Free-Flow Electrophoretic Separation of Lymphocytes. Two Thoracic Duct Lymphocyte Subpopulations Studied after Prolonged Cannulation and Immunization. 

Maffezzoli RD. Kaplan GN. Chrambach A. 
Fractionation of Immunoreactive Human Chorionic Gonadotropin and Luteinizing Hormone by Isoelectric Focusing in Polyacrylamide Gel. 

Elgin SC. Bonner J. 
Partial Fractionation and Chemical Characterization of the Major Non-histone Chromosomal Proteins. 

Grigor'ev RN. Stepanova IA. Vorobeichikov VM. 
Methods of Electrophoretic Concentration of Mycobacterium Tuberculosis. 

Hata R. Nagai Y. 
Preparative Gel Electrophoresis of Liver Polyribosomal RNA. 

Graesslin D. Trautwein A. Bettendorf G. 
Gel Isoelectric Focusing of Glycoprotein Hormones. 
814 Hoekstra J. Deinhardt F.  
Counter-Immunoelectrophoresis--Rapid Method for Detecting Group--Specific Antigen and Antibodies Associated with Oncogenic Ribonucleic Acid Viruses.  

L-Asparaginase from Proteus Vulgaris. Purification, Crystallization, and Enzymic Properties.  

825 Wuepper KD. Cochrane CG.  

833 Tallman JF. Brady RO.  
The Purification and Properties of a Mammalian Neuraminidase (Sialidase).  
Eng. Biochim Biophys Acta. 293,434-43. 15 Feb 73.

835 Dajani AS.  
Rapid Identification of Beta Hemolytic Streptococci by Counterimmuno-electrophoresis.  

836 Van Epps DE. Andersen BR.  
Isolation of Streptolysin O by Preparative Polyacrylamide Gel Electrophoresis.  

847 Righetti PG. Drysdale JW.  
Small-Scale Fractionation of Proteins and Nucleic Acids by Isoelectric Focusing in Polyacrylamide Gels.  
Eng. Ann NY Acad Sci. 209,163-86. 15 Jun 73.

848 Park CM.  
Isoelectric Focusing and the Study of Interacting Protein Systems-Ligand Binding, Phosphate Binding, and Subunit Exchange in Hemoglobin.  

851 Weller DL. Heaney A. Franceschi RT. Boudreau RE. Shaw DE.  
Isoelectric Focusing and Study of Ribosomal Proteins and Lactate Dehydrogenase.  

856 Bagshaw JC. Drysdale JW. Malt RA.  
Multiple Forms of Mammalian RNA Polymerase Displayed by Gel Electrofocusing.  

869 Guarriero-Bobyleva V. Volpi-Becchi MA. Masini A.  
Parallel Partial Purification of Cytoplasmic and Mitochondrial Aconitate Hydratases from Rat Liver.  
Eng. Eur J Biochem. 34,455-8. 2 May 73.
MACRO-CELLULAR SEPARATION

872 Kohnert KD, Ziegler M, Zuhlke H, Wilke B.
Isoelectric Focusing-Immunossay- A New Technique applied to the High
Molecular Weight A-Component from Bovine Insulin.

895 Stahn R, Maier KP, Hannig K.
A New Method for the Preparation of Rat Liver Lysosomes. Separation
of Cell Organelles of Rat Liver by Carrier-Free Continuous Electrophoresis.

901 Wright GL Jr, Farrell KB, Roberts DB.
An Evaluation of Gradient Acrylamide Gel Electrophoresis and Acrylamide
Gel isoelectric Focusing for the Primary Separation of Complex Mixtures
of Proteins- Comparison of One- and Two-Dimensional Analytical Procedures.
Eng. Biochim Biophys Acta. 295,396-411. 21 Feb 73.

908 Shimada K, Sekikawa K, Fujinaga K, Ito Y.
A New Device of Preparative Polyacrylamide Gel Electrophoresis and Its
Application to Analysis of Cellular RNA.

928 Krichevskaja AA, Lukash AI, Sherstnev KB.
Separation of Brain Proteins by a Combination of Isoelectric Focusing
and Polyacrylamide Gel Electrophoresis.
Rus. Dokl Akad Nauk SSSR. 209,1454-6. 21 Apr 73.

932 Conde RD, Paladini AC, Santome JA, Dellacha JM.
Isolation, Purification and Characterization of Equine Growth Hormone.

934 Rippe DF, Berry LJ.
Purification and Immunological Characterization of Mouse Hepatic
Phosphoenolpyruvate Carboxykinase.

940 Obijeski JF, Palmer EL, Gafford LG, Randall CC.
Polyacrylamide Gel Electrophoresis of Fowlpox and Vaccinia Virus Proteins.

952 Milosevic P, Rakic L.
Fractionation of the Proteins of the Soluble Fraction of Brain.

954 Chan SL, Shirachi DY, Bhargava HN, Gardner E, Trevor AJ.
Purification and Properties of Multiple Forms of Brain Acetylcholinesterase
(EC 3.1.1.7).
MACRO-CELLULAR SEPARATION

974 Jacobsen N.
Isoelectric Variants of Macaca Irus Salivary Alpha-Amylase.

978 Kawata I.
Polyacrylamide Gel Electrophoresis of RNA.

980 Jirka M. Blanicky P.
Quantitative Immunelectrofocusing of Proteins with Respect to Their Heterogeneity.

981 Barrett LD. Johns EW.
A Method for Differentiating Between Arginine-Rich Histones and Others in Polyacrylamide Gel.
Eng. J Chromatogr. 75, 161-4. 3 Jan 73.

985 Vinik AI. Kaplan SL. Crumbach MM.
Purification, Characterization and Comparison of Immunological Properties of Monkey Chorionic Somatomammotropin with Human and Monkey Growth Hormone, Human Chorionic Somatomammotropin and Ovine Prolactin.
Eng. Endocrinology. 92, 1051-64. Apr 73.

986 Sherins RJ. Waiukaitis JL. Chrambach A.
Physical Characterization of Human Follicle Stimulating Hormone and Its Desialylation Products by Isoelectric Focusing and Electrophoresis in Polyacrylamide Gel.

989 Beckers JL. Everaerts FM. Houtermans WJ.
The Qualitative Separation of Fatty Acids by Isotachophoresis.

1002 Murros J. Kouttinen A. Somer H.
An Electrophoretic Method for the Quantitation of Aspartate Aminotransferase Isoenzymes.

1009 Paus PN. Alfheim I.
Analytical Polyacrylamide Gel Electrophoresis of Milligram Quantities of RNA.

1010 Amaldi P.
Autoradiographic Detection of H 3 -RNA Fractionated by Polyacrylamide Gel Electrophoresis.

1018A Loh WP.
Three-Minute Electrophoresis for Rapid Identification of Hemoglobin S.
MACRO-CELLULAR SEPARATION

1024  Josephson RV.
Isoelectric Focusing of Bovine Milk Caseins.

1025  Matheka HD, Straub OC.
Further Investigations to Differentiate IBR-Virus from IIV-Virus by the Carrier-Free Zone Electrophoresis in a Glucose Density Gradient.

1033  Chern CJ, Rittenberg MB, Black JA.
Purification of Human Erythrocyte Pyruvate Kinase.

1039  Tiollais P, Calibert F, Lepetit A, Auger MA.
Polyacrylamide Gel Electrophoresis of Ribonucleic Acids.

1041  Ishikawa H.
Fractionation of Dermal Acid Mucopolysaccharides by Cellulose Acetate Electrophoresis.

1042  Koshiyama I.

1046  Merz DC, Good RA, Litman GW.
Segregation of Membrane Components using Isoelectric Focusing in Polyacrylamide Gels.

1054  Fletcher PL Jr, Hash JH.
Ribonuclease of Chalaropsis Species. I. Isolation and Physical Properties.
Eng. Biochemistry. 11,4274-80. 7 Nov 72.

1061  Miner GD, Heston LL.
Method for Acrylamide Gel Isoelectric Focusing in Insoluble Brain Proteins.

1066  Wachter R De, Fiers W.
Preparative Two-Dimensional Polyacrylamide Gel Electrophoresis of 32 P-Labeled RNA.

1071  Vestermark A, Sjodin B.
Isotachophoresis in Two-Dimensional Combination with Zone Electrophoresis for the Concentration and Separation of Glucose Metabolites.
Eng. J Chromatogr. 73,211-8. 8 Nov 72.
MACRO-CELLULAR SEPARATION

1074 Girolami A. Sticchi A. Bareggi G.
Crossover Electrophoresis (Electrosyneresis) Visualization of the Abnormal Factor X (Factor X Friuli).

1076 Koenig R.
Anomalous Behavior of the Coat Proteins of Potato Virus X and Cactus Virus X During Electrophoresis in Dodecyl Sulfate-Containing Polyacrylamide Gels.

1085 Zeiller K. Dolan L.
Thymus Specific Antigen on Electrophoretically Separated Rat Lymphocytes. Tracing of the Differentiation Pathway of Bone Marrow-Derived Thymocytes by Use of a Surface Marker.

1094 Barry J. Alberts B.
In Vitro Complementation as an Assay for New Proteins Required for Bacteriophage T4 DNA Replication- Purification of the Complex Specified by T4 Genes 44 and 62.

1098 Ventrelli I.
Electrophoretic Fractionation of Staphylococcus Aureus Extracts.

1102 Schumacher K. Alzer G. Oerkermann H. Uhlenbruck G.
Isolation of the Mitogenic Components from Phytohaemagglutinin.

1104 Zuidweg MH. Bos CJ. Welzyn H Van.
Proteolytic Components of Alkaline Proteases of Bacillus Strains. Zymograms and Electrophoretic Isolation.

1114 Paine PL. Feldherr CM.
Nucleocytoplasmic Exchange of Macromolecules.

1115 Hiramatsu A. Ouchi T.
A Neutral Proteinase from Streptomyces Maraensis. 3. An Improved Purification and Some Physiochemical Properties.

1118 Smeds S. Bjorkman U.
Micro-Scale Protein Separation by Electrophoresis in Continuous Polyacrylamide Concentration Gradients.
Vestermark A. Sjodin B.
Isotachophoresis Used Alone or in Two-Dimensional Combination with Zone Electrophoresis for the Small-Scale Isolation of Labelled Ribulose-1,5-Diphosphate.

Nordberg GF, Nordberg M, Piscator M, Vesterberg O.
Separation of Two Forms of Rabbit Metallothionein by Isoelectric Focusing.

Caspary EA, Field EJ.
Electrophoretic Slowing of Sensitized Lymphocyte-Macrophage Mixtures—A Cellular Technique in Immunochemistry.

McCarthy D, Hawkes SP, Lander DE.
Small-Scale Preparative Gel Electrophoresis of Ribonucleic Acids.
PHARMACEUTICALS


510 Seno N. Anno K. Kondo K. Nagase S. Saito S.
Improved Method for Electrophoretic Separation and Rapid Quantitation
Of Isomeric Chondroitin Sulfates on Cellulose Acetate Strips.

520 Braselton WE Jr. McShan WII.
Purification and Properties of Follicle-Stimulating and Luteinizing
Hormones from Horse Pituitary Glands.

528 Norberg P. Hofsten B Von.
Chromatography of a Halophilic Enzyme on Hydroxylapatite in 3.4 M
Sodium Chloride.

553 Castle AV. Wheelock JV.
Purification of Rennin.

604 Oranskii IE. Iuvenina IM.
Electrophoresis of Drugs in an Ultrasonic Field.

608 Schwartz D.
A Method of High Resolution Immunoelectrophoresis for the Alcohol
Dehydrogenase Isozymes.

651 Van Kreel BK. Van Eijk HG. Leijnse B.
The Iso-Electric Fractionation of Rabbit Ferritin.

653 Kennedy SC. Rauner R. Gawron O.
On Pig Heart Aconitase.
Eng. Biochim Biophys Res Commun. 47,740-5. 26 May 72.

662 Eto S. Suzuki H.
Detection of Antithyroid Antibody by Fluoro-Electrosyneresis, with
Special Reference to Clear Line Antibody.

714 Urushizaki I. Niitsu Y. Matsuda M.
Electrofocusing Column Fractionation of Horse Spleen Ferritin.

749 Ellis N. Alperin JB.
Laboratory Suggestions- A Rapid Method for Electrophoresis of
Erythrocyte Glucose-6-Phosphate Dehydrogenase on Cellulose Acetate
Plates.

782 Maffezzoli RD. Kaplan GN. Chramback A.
Fractionalization of Immunoreactive Human Chorionic Gonadotropin and
Luteinizing Hormone by Isoelectric focusing in Polyacrylamide Gel.


BLOOD RESEARCH

15 Strekalov AA. Novoseletskii AG.
Behavior of Hemoglobin Octamer in Linear Mice in Electrophoresis.

31 Fondo EY Jr. Bartalos M.
Electrophoretic Separation of Multiple Bands with Beta-Glucuronidase
Activity in Human Sera.

32 Praxedes H. Mesquita MP DE. Dias AG.
Por. Hospital (Rig). 74,567-73. Aug. 68.

41 Searcy RL. Hines LR.
Electrophoretic Behavior of Sonicated Human Serum Proteins.
Eng. Experientia. 25,914-6. 15 Sep 69.

46 Abraham K. Schutt K. Muller I. Hoffmeister H.
Continuous Polyacrylamide Electrophoresis. I. Studies on Normal Sera.

52 Kostner G. Albert W. Holasek A.
Analytical Isoelectric Focussing of Human Serum Lipoproteinns.

70 Burstein M.
Serum Beta Lipoproteins in Reversed Immunoelectrophoresis.

75 Furuta K.
Immunoelectrophoretic Study of Circulating Blood.

84 Fahie-Wilson MN.
Routine Investigation of Amino Acid Patterns in Blood Serum and Urine
By Thin-Layer Electrophoresis.

108 Wraxall BG. Culliford BJ.
A Thin-Layer Starch Gel Method for Enzyme Typing of Bloodstains.

134 Lane RF.
Serum Lipoprotein Patterns by Electrophoresis.
139 EK N.
Studies on Electrophoresis on Cellulose Acetate Membrane of Bovine Serum Proteins in Healthy Animals.

140 Hara T.
A Study on Serum Protein Fraction by Cellulose Acetate Membrane Electrophoresis in Childhood.

144 Turowska B. Gawrzewski W. Opolska B.
The Use of Thin-Layer Electrophoresis in Starch Gel for Determination of Alkaline Phosphatase in Human Blood Serum.

156 Schutzler G. Siegert M. Jarofke D.
Quantitative Determination of Serum Proteins and Test of Their Color Affinity with Agar Gel Electrophoresis.
Ger. Berlin Munchen Tierarztl Wschr. 82,42-5. 1 Feb 69.

180 Stephan W. Frahm U.
Quantitative Immunoelectrophoresis- A Micromethod for the Routine Determination of Serum Proteins.

208 Leaback DH. Walker PG.
Some Applications of Gel Isoelectric Focusing to the Examination of Human Serum Proteins.

212 Schlesinger D.
Determination of GC Types by Starch-Gel Electrophoresis.

217 Larcan A. Streiff F. Stoltz JF. Alexandre P.
Influence of Liquoid on Electrophoretic Mobility and Some Thrombocytic Properties. Correlation with the Action on Mesenteric Circulation in the Rat.

232 Kucerova L. Stork A. Fabian E. Papezova R.
Use of Electrophoresis of Serum Lipoproteins in the Diagnosis of Primary Hyperlipoproteinemias.
Che. SB Lek. 73,135-42. May 71.

238 Ferri S. Birgel EH. Silva RA.
Electrophoretic Study of Seric Proteins in Normal Toggenburg Female Goats with Aging.
241 Wehinger H. Alebouyeh M.  
Quantitative Densitometric Determination of Hemoglobin A2 Following  
Micro-Zone Electrophoresis with Cellulose Acetate Foil.  
Ger. Klin Wochenschr. 48,701-3. 1 Jun 70.

243 Chalvardjian A.  
Agarose--Starch Gel Electrophoresis of Rat Serum Lipoproteins.  

260 Johnson EA.  
Electrophoretic Separation of Plasma Lipoproteins Using Agarose Gel  
On a Side.  

267 Kucerova L. Stork A. Fabian E. Papezova R.  
Determination of Serum Lipoproteins with Paper and Agarose  
Electrophoresis.  

271 Srinivasan SR. Lopez A. Radhakrishnamurthy B. Berenson GS.  
A Simple Technic for Semiquantitative, Clinical Estimation of Serum  
Beta- and Pre-Beta-Lipoproteins.  

272 Schyma D. Taubert M.  
Analysis of Paraproteins of Serum by Electrophoresis Using a  
Carrier-Gel Produced from Alginic Acid and Electrolytes.  

275 Elphick MC.  
Microscope Slide Electrophoresis of Serum Lipoproteins in Agarose  
Gel.  

284 Papadopoulos NM. Kintzios JA.  
Varieties of Human Serum Lipoprotein Pattern- Evaluation by Agarose  
Gel Electrophoresis.  

291 Lyngbye J. Kroll J.  
Quantitative Immunoelectrophoresis of Proteins in Serum from a Normal  
Population- Season-, Age-, and sex-Related Variations.  

293 Rho GL. Vergani C. Vannotti M. Vecchi G.  
Electrophoresis of Plasma Lipoproteins on Gelatinized Cellulose  
Acetate.  


Zollner N. Grobner W. Berger C. Wolfram G.
Electrophoretic Separation of Serum Lipoproteins in Agarose Gel With
the Addition of Albumin.

Klemens UH. Schmalbeck J.
Lipoprotein Electrophoresis on Cellulose Acetate Membranes. An
Analytical and Semi-Quantitative Method Suitable for the Clinical
Routine.

Frangini V.
Hemoglobin A2 Values Determined by Means of Radial Electrophoresis on
Cellulose Acetate Gel in Normal Neonates and Infants.

Kroning G. Rechenberger J.
Electrophoretic Separation of Serum Lipoproteins Using Eri 10 for the
Assessment of the Pherograms.

Streiff F. Stoltz JF. Larcan A. Alexandre P.
Influence of Ionic Strength, H+ Ions and Polybrene on the
Electrophoretic Mobility of Human Blood Platelets.

Kampen EJ Van. Plceg PH Van DER.
Lipoprotein Electrophoresis on Gelatinized Cellulose Acetate.

Streiff F. Stoltz JF. Genetet B.
Electrophoretic Mobility of the Erythrocyte.

Ahlers I. Milarova R. Ahlersova E.
Electrophoresis of Human Serum Lipoproteins in Modified Agar and
Agarose.
Sloc. Cas Lek Cesk. 111,592-4. 16 Jun 72.

Fuller JM. Keyser JW.
Some Technical Aspects of Quantitative Immuno-electrophoresis of Human
Serum and Cerebrospinal Fluid.

Koubek K. Erbenova L.
Electrophoretic Pattern of Mouse Haemoglobin in F 1 Hybrids as
Compared to a Mixture of Parent-Strain Haemoglobins.
645 Dees SC.
Longitudinal Study of Serum Proteins in Allergic Children.

655 Sturgeon P., Kolin A., Kwak KS., Luner SJ.
Studies of Human Erythrocytes by Endless Belt Electrophoresis. I. A Comparison of Electrophoretic Mobility with Serologic Reactivity.

661 Gabr Y., Soliman MH., Dawoud S., El-Molla A., Amin ES.
Studies on Stabilized Human Plasma Protein Solution.

703 Kipping D.
Importance of Electrophoresis in Studies of Proteins of Human Semen.

710 De Pizzolota MC., Del Campo GB., Pizzolato MA., Vergani C.
Sensitive, Rapid Quantitation of Serum and Urinary Protein by Electroimmunodiffusion.

711 Koti KB., Sharsri MG., Sainani GS.
Study of Electrophoretic Pattern of Serum Proteins in Hypoproteinaemic States.

717 Yamazaki S., Arima T.
Lipoprotein Analysis Using Paper Electrophoresis.

718 Kanno T., Tsukamoto H.
Electrophoresis Analysis of Lipoproteins of Cellulose Acetate.

719 Okishio T., Matsumiya K.
Analysis of Lipoproteins Using Agarose Gel and Disc Electrophoresis.

731 Magnani HN., Howard AN.

732 Evans DI.
Haemoglobin Electrophoresis on Cellulose Acetate Using Whole Blood Samples.
Disc Electrophoresis of Serum Lipoprotein--A New Method Derived From Ornstein-Davis Method.  

Rheophoretic Evaluation of Stokes Radii in Cell Electrophoresis.  

Repeated Reuse of a Starch Gel in Hemoglobin Screening.  

Evaluation of Quantitative Analysis of Serum Protein by Immunological Methods.  

Semi-Quantitative Paper Electrophoresis of Serum Lipoproteins.  

High Resolution Two-Dimensional Polyacrylamide Electrophoresis of Human Serum Proteins.  

An Evaluation of Cellulose Acetate Electrophoresis for the Determination of Human Plasma Lipoprotein Patterns.  

Application of the Technique of Isoelectric Focusing to the Study of Human Serum, Lipoproteins and Their Apoproteins.  

The Use of Isoelectric Focusing to Study Components of the Human Plasma Kinin-Forming System.  

Quantitative Agarose Gel Electrophoresis of Plasma Lipoproteins-A

Characteristics of Posthemorrhagic Regeneration of Blood Proteins in Disordered Thyroid Hormone Balance.  
914 Catsimpoolas N. Kenney J.
Analytical Isotachophoresis of Human Serum Proteins with Ampholine Spacers.

923 Saint-Paul M. Rebeyrotte P. Derobert L. Pellet J. Labbe JP.
2-Dimensional Immunoelectrophoretic Studies on the Degradation of Serum Proteins by Decay.

968 Barton RJ.
Anomalous Behaviour of Bovine Serum Albumin in Electrophoresis on Non-Denaturing Polyacrylamide Gel.

973 Wada M. Naito HK. Ehrhart LA. Lewis LA.
Polyacrylamide-Gel Block-Electrophoresis of Plasma Lipoproteins.

Kleist H.
Electrophoresis of Native Serum Albumin and Albumin Preparations in Urea-Agar-Gel.

996 Gysin J.
Analysis of Scorpion Serum Proteins by Immunoelectrophoresis.

995 Laurell CB.
Is Electrophoretic Analysis of Plasma Proteins Becoming Out-Dated.

1003 Afonso E. Affonso A. Sansguiri RS.
Orthogonal Immunodiffusion and Immunodiffusion and Immunoelectrophoresis of Serum Proteins.

1012 Ghosh S. Basu MK. Schwappe JS.
Agarose Gel Electrophoresis of Serum Lipoproteins- Determination of True Mobility, Isoelectric Point, and Molecular size.

1026 Dudarev VP.
An Improvement of Methods for Rat Hemoglobin Electrophoresis in Agar Gel.

1037 Winch MA. Versey J. Noble AR. Munday KA.
A New Direct Method for the Assay of Human Renin.
Eng. Experientia. 28, 1394-5. 15 Nov 72.

1045 Kartel "MV. The Variability of Electrophoretic Mobility of Rat Serum Protein.


BASIC RESEARCH

2 Bertrand F. Watelet M. Genetet P. Nabet P. Paysant P. 
Lipoproteinograms on Gel Cellulose Acetate in the Micromethod. 

3 Harris GC Jr. Sweeney MJ. 
Electrophoretic Evaluation of Blood Sera Proteins of Adult Male 
Chickens. 

5 Koziol A. 
Serum Proteinogram in the Newborn with Serological Conflict Treated 
by Exchange Blood Transfusion. 

10 Weiss L. Cudney TL. 
Some Effects of PH and Formaldehyde on the Cellular Electrokinetic Surface. 
Eng. Int J Cancer. 4,776-84. 15 Nov 69.

11 Saha N. Banerjee B. 
A Comparative Study of Serum Protein Electrophoretic Patterns in 
Indians and Europeans. 

14 Wilkins DJ. Myers PA. 
The Anomalous Electrophoretic Behavior of Certain Absorbed Protein.

16 Bert G. Lajolo Di Cossano D. Pecco P. Mazzei D. 
Effect of A.L.S. and Prednisolone on the Electrophoretic Mobility of 
Lymphocytes. 

19 Lichtman MA. Weed RI. 
Electrophoretic Mobility and N-Acetyl Neuraminic Acid Content of 
Human Normal and Leukemic Lymphocytes and Granulocytes. 

24 Moggi C. Carattoli MT. 
Study of Serum Protein Fractions in Full Term and Premature Infants 
by Means of Radial Electrophoresis on Cellulose Acetate Gel. 

27 Tanner CE. 
Immunological Study of the Antigens of Trichinella Spiralis Larvae. 
IV. Purification by Continuous-Flow Paper Electrophoresis and Column 
Chromatography. 
BASIC RESEARCH

29 Brummel MC. Montgomery R.
Acrylamide Gel Electrophoresis of the S-Sulfo Derivatives of
Fibrinogen.

33 Refetoff S. Robin NI. Fang VS.
Parameters of Thyroid Function in Serum of 16 Selected Vertebrate
Species- A Study of PBI, Serum T4, Free T4, and the Pattern of T4 and
T3 Binding TC Serum Proteins.

34 Hamilton RW Jr. Cohen JD. Doebbler GF. Exposito LF. King JM.
Smith KH. Schreiner HR.
Biochemical and Metabolic Effects of a Six-Month Exposure of Small

36 Gotz H. Heinebrodt A.
Serum Proteins in Animals. Biochemical and Immunoelectrophoretic
Analyses of Bovine Serum.

38 Kuhn RA.
Igg-Paraproteinemias in Immunoelectrophoresis. A Contribution on the
Structure and Importance of These Proteins.

42 Zippel R. Meyer P. Bietz G.
Electrophoresis of Parotid Secretion. II. Membrane Electrophoresis.

43 Sebastiani A. Assumma M. Balestrieri A.
Standard Serum Protein Electrophoretic Diagram in Certain Groups of
Tropical Populations.

47 Beckering RE Jr. Elleeson RD.
A Rapid Method for Lipoprotein Electrophoresis Using Cellulose
Acetate as Support Medium.

49 Dmitrenko NP.
Studying the Sarcoplasmic and Mitochondrial Isoenzymes of Atp-
Creatine Phosphotransferase of Vertebrate Muscles by Electrophoresis
on Agar Gel.
BASIC RESEARCH

50 Belik IAV. Smerchinskaia LS. Glovatskaia EP. 
Electrophoretic Study of Proteins Extracted From Subcellular 
Structures of Brain with Triton X-100.

55 Korinek J. 
Adjustment of the Agar Carrier for Immunoelectrophoresis of Proteins 
With Regard to Demonstration of the GC Component in Human Serum. 

63 Reichel A. Gerbstadt H. 
Comparative Studies of Plasma and Lymph of the Frog (Rana Esculenta 
and Rana Temporaria), By Means of Medium-Free Electrophoresis and 
Paper Electrophoresis. 

64 Brown IR. 
Polyacrylamide Gel Electrophoresis of DNA Polymerase From Ehrlich 
Ascites Tumor Cells and Recovery of Active Enzyme. 

66 Azen EA. Smithies C. Hiller C. 
High-Voltage Starch-Gel Electrophoresis in the Study of Post-Albumin 
Proteins and C'3 (Beta 1C-Globulin) Polymorphism. 

67 Der Kaloustian VM. Eyrne R. Young WJ. Childs B. 
An Electrophoretic Method for Detecting Hypoxanthine-Guanine 
Phosphoribosyl Transferase Variants. 

69 Fullarton JR. Kenny AJ. 
A Rapid System for Preparative Electrophoresis Depending on 
Isoelectric Buffers of Low Conductivity. 

71 Bert G. Lajolo Di Cossano D. Pecco P. 
The Detection by Cellular Electrophoresis of Surface Antibodies on 
Human Lymphocytes. 

78 Abrams B. Clarke HG. 
Serum Immunoelectrophoresis in Patients with Ewing's Sarcoma. 
Eng. Lancet. 1,300. 7 Feb 70.

86 Schellner HP. 
Electrophoresis of Chicken Serum with Acetate Folium and Reseparation 
in Polyacrylamide Gel. 
Ger. Berlin Munchen Tierarztl Wschr. 82,351-2. 15 Sep 69.
<table>
<thead>
<tr>
<th>89</th>
<th>Lozsa A. Kereszti Z. Berencsi G.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Possibilities of Differentiation of Paraproteins by Means of Electrophoresis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>91</th>
<th>Brachmann K., Muller J.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Use of Paper Electrophoresis Apparatus of the Web Carl Zeiss Jena for Other Types of Electrophoresis. 3. Membrane-Foil Electrophoresis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>95</th>
<th>Birnboim HC. Glickman J.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fractionation of Cligonucleotide Isopliaths by Electrophoresis on Polyacrylamide Gels.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>98</th>
<th>Peduzzi R. Turian G.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Immunochemistry and Electrophoresis of the Conidiation of Neurospora Crassa.</td>
</tr>
<tr>
<td></td>
<td>Fre. Experientia. 25, 1178-80. 15 Nov 69.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>100</th>
<th>Caliguiri LA. Klenk HD. Choppin PW.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The Proteins of the Parainfluenza Virus SV5. 1. Separation of Virion Polypeptides by Polyacrylamide Gel Electrophoresis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>101</th>
<th>Lewis WH. Truslove GM.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Electrophoretic Heterogeneity of Mouse Erythrocyte Peptidases.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>103</th>
<th>Jonas We.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Immunolectrophoretic Analysis of Sheep Serum Using Guinea-Pig Antisera To Particulate Antigens Treated With Sheep Antiserum.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>112</th>
<th>Alper CA. Johnson AM.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Immunofixation Electrophoresis- A Technique for the Study of Protein Polymorphism.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>128</th>
<th>Goullet P.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fractionation of Escherichia Coli K12 Soluble Proteins by Agarose Acrylamide Gel Electrophoresis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>129</th>
<th>Merkur'Eva RV. Balaea TIA. Markova ON.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Electrophoretic Study of Mucopolysaccharides After Compound Fracture.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>130</th>
<th>Berger B.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agarose Gel Electrophoresis of Proteins from Bovine Corneal Epithelium.</td>
</tr>
</tbody>
</table>
148 Montie TC. Montie DB.
Heterogeneity Between Two Mouse-Toxic Protein Polymers From
Pasteurella Pestis Indicated by Electrophoresis Patterns in a
Phenol-Acetic Acid-Urea Gel System.

153 Buresh L.
Determination of Sperm in Sperm Stains by Paper Electrophoresis.

163 Caputo MJ. Taft DM.
Separation of Serum Alkaline Phosphatases by Micro Starch Gel
Electrophoresis.

165 Hamana K. Hafez ES.
Protein Electrophoretic Pattern of Bovine Allantoic Fluid During
Early Pregnancy.

175 Flodh H. Bergraham B. Oden B.
Vitamin B 12-Binding Substances in the Gastric Mucosa of Mice as
Studied by Sephadex Gel Filtration and Isoelectric Focusing.

176 Sherwin RM. Moore GH.
Microzone Electrophoresis of Unconcentrated Cerebrospinal Fluid Using
Cellulose Acetate Strips and Nigrosin Dye.

264 Tohou HP. Claflin AJ. Muench KH.
Tryptophanyl Transfer RNA Synthetase from Lymphocytes of Human
Chronic Lymphocytic Leukemia.

319 Vaidya RA. Glass RH. Danekar P. Johnson K.
Decrease in the Electrophoretic Mobility of Rabbit Spermatozoa
Following Intra-Uterine Incubation.

320 Rose H. Mildenhauer H.
Immuno-electrophoretic Examinations of the Effect of Whole Body
Irradiation on the Serum Protein Picture of Juvenile Rats.

337 Vymola F. Lochmann C. Buda J. Jedlickova Z. Phiich J.
Study of Pseudomonas Aeruginosa-Haemolysin by Electrophoresis.
338 Darwiche Z. Tran -Van-Ky P. Muller PH. 
New Electrophoresis Technic Applied to the Identification of the 
Specific Enzyme of Human Sperm. 

342 McClelland DB. Finlayson ND. Samson RR. Nairn IM. Shearman DJ. 
Quantitzation of Immunoglobulins in Gastric Juice by 
Electroimmunodiffusion. 

349 Yabuno K. 
Changes in Electronegativity of the Cell Surface During the 
Development of the Cell Surface During the Development of the 
Cellular Slime Mold, Dictyostelium Discoideum. 

415 Kolar O. Mathews F. Pedersen B. 
Immunoelectrophoretic and Immunochemical Studies of Human Muscle 
Proteins. 

416 Gesinski RM 
Dextran Induced Changes in the Electrophoretic Mobility of Rat Bone 
Narrow Erythroctyes. 
Eng. Experientia. 26,1370-1. 15 Dec 70.

435 Spiess E. Richter G. 
Isolation and Characterization of Rapidly Labelled RNA From Euglena 
Gracilis by Means of Analytical and Preparative Electrophoresis in 
Polyacrylamide Gels. 

473 Jarecki R. Pogacar P. Gunther G. Klein H. 
Early Enzyme Changes in Skin Woulds Demonstrated by Isoelectric 
Focusing in Polyacrylamide Gel. 

477 Dan M. 
A New Method for Microelectrophoresis. Separation of Hemoglobin 
Contents in Erythrocytes of R. Catesbeiana Tadpoles. 

480 Schettler CH. 
Evidence of Hemoglobin-Binding Protein in Serums of Chicken. 
Ger. Dtsch Tierarztl Wochenschr. 77,33-7. 15 Jan 70.
BASIC RESEARCH

482 Milkowski S. Zajaczkowski S.
Electrophoresis of Tears.
Pls. Wiad Lek. 23,1725-3C. 1 Oct 70.

492 Saint-Paul M. Derobert L.
Perspective in Immunologic Study of Cadaver Blood.

502 Urbaschek B. Rapo W.
Electrophoretic and Immunoelectrophoretic Analyses After Induction of
Endotoxin Tolerance by Detoxified Endotoxin (Endotoxoid).

519 Ranque J. Quiliot M. Dunan S. Assadourian Y.
Gelose Immunoprecipitation Reactions in Leishmaniasis.

558 O'Brien SJ. Macintyre RJ.
The -Glycerophosphate Cycle in Drosophila Melanogaster. I.
Biochemical and Developmental Aspects.

559 Berne BH. Dray S. Knight KL.
Contribution of the Allelic MTZ3 and MTZ4 Allotype Genes to the
Formation of Individual Rabbit Serum Alpha@-Macroglobulin
Molecules.

570 Yamada T.
The Electrophoretic Changes of Mammalian Cells Associated with
Malignant Transformation.

739 Coutelle R.
Resolution of -Glucuronidase From Ehrlich Ascites Carcinoma Cells
and Mouse Brain by Isoelectro Focusing in Polyacrylamide.

762 Bonar RA. Ishizaki R. Beard JW.
Immunoelectrophoretic Analysis of Avian Ribonucleic Acid Tumor Virus
Group-Specific Antigens.

820 Potapenkova LS.
An Electrophoretic Analysis of the Serum Proteins and Soluble Liver
Proteins of Mice During Experimental Hepatocarcinogenesis.

840 Ludicello P. Nigro N. Jacob RM. Benso A. Camonte A.
Electrophoretic Analysis of Human Serum After Incubation with a
RNA-Rich Fraction. Study in Children with Tumors.

134
879 Rosai J. Tillack TW. Marchesi VT.
Membrane Antigens of Human Colonic Carcinoma and Non-Tumoral Colonic
Mucosa- Results Obtained with a New Isolation Method.

892 Orrick LR. Olson MD. Busch H.
Comparison of Nucleolar Proteins of Normal Rat Liver and Novikoff
Hepatoma Ascites Cells by Two-Dimensional Polyacrylamide Gel
Electrophoresis.

964 Quinn JR.
The Reduction of Ferric Myoglobin by Ampholine on Acrylamide Gel
Electrofocusing.
Eng. J Chromatogr. 76,520-2. 28 Feb 73.

971 Storring PL. Burns TW. Furnival EE. Hales ON. Langley P.
Hartree AS.
Lipolytic Activity of Human Pituitary Fractions on Human Adipose
Tissue Cells.

997 Allouch P. Baulieu EE. Milgrom E.
Physicochemical Properties of Progesterone Binding Protein (PBP) from
the Plasma of Pregnant Guinea Pigs.

1001 Lindbak H. Skandsen S. Julsrud OJ.
Agarose-Electrophoresis of Spinal Fluid.

1020 Dion AS. Moore DH.
Gel Electrophoresis of Reverse Transcriptase Activity of Murine
Mammary Tumour Virions.

1030 Starostin NN.
Gel Preparation for Electrophoretic Determination of Haptoglobin
Types.

1029 Cohen S. Yalor JM. Murakami K. Michelakis AM. Inagami T.
Isolation and Characterization of Remin-Like Enzymes from Mouse
Submaxillary Glands.

1072 Sjödin B. Vestermark A.
Quantitative Determination of Glucose Metabolites Separated by
Isotachophoresis in Two-Dimensional Combination with Zone
Electrophoresis.

135
1087 Tegtmeyer P. Macasaet F.
Simian Virus 40 Deoxyribonucleic Acid Synthesis—Analysis by Gel
Electrophoresis.

1089 Tashian RE. YU YS.
Effect of Chlorthalidone Binding on the Electrophoretic Properties of
Human Red Cell Carbonic Anhydrase Isozymes.

1109 Munyon W. Buchsbaum R. Pagletti E. Mann J. Kraiseblurd E.
Davis D.
Electrophoresis of Thymidine Kinase Activity Synthesized by Cells
Transformed by Herpes Simplex Virus.
SPECIAL TECHNIQUE

8 Bannister WH, Wood EJ.
Isoelectric Focussing and Acrylamide Gel Electrophoresis of Human Erythrocuprein.
Eng. Life Sci. 9,229-33. 22 Feb 70.

18 Kavsan VM, Taikova NV, Serebrianii SB.
Determination of Amino Acid Composition by High-Voltage Electrophoresis.

56 Wingo WJ, Carlson GL, Bordenca CM
Apparatus for Rapid Application of Samples in Paper Chromatography, Paper Electrophoresis, and Thin-Layer Chromatography.

73 Nakamura S.

80 Khavkin IUA, Akatova EN.
The Technic of Zonal Electrophoresis. 2. Horizontal Electrophoresis in Polyacrylamide Gel with Transverse Gradient of Density.

85 Nelson TE Jr.
Multiple Channel Gel Immunoelectrophoresis- a Further Step Towards Standardization.

88 Dittmer A.
Methods and Perspectives of Micro-Zone Electrophoresis on Paper Strips Impregnated with Agar.

93 Chalvardjian A.
An Apparatus for Vertical Gel Electrophoresis on Microscope Slides.

97 Kamaryt J.
An Apparatus for the Production and Photodocumentation of Agar Gel Enzyme Electrophoretograms.

99 Momotani Y.
Electrofocusing with Acrylamide Gel as a Support.
<table>
<thead>
<tr>
<th>No.</th>
<th>Author(s)</th>
<th>Title</th>
<th>Journal/Details</th>
</tr>
</thead>
</table>


321 Finlayson GR.
Isoelectric Focusing in Polyacrylamide Gel and its Preparative Application.

322 Josephson RV. Maheswaran SK. Murr CV. Jenness R. Lindocrer RK.
Effect of Urea on Pi's of Ampholytes and Casein in Isoelectric Focusing.

344 Kaliuzhnyi VV.
Electrophoretic Determination of Benzohexonium in Rabbit Urine Using Nonpolarizing and Standard Electrodes.

339 Serrvanova KF. Gordeev IUN. Troitskii CV.
Spectropolarimetric Characteristics of Albumin and Globulin in Thyroid Toxicoses.

368 Glazer LG.
Method of Forming Wells in Gels for Use in Electrophoresis.

377 Kubicek R.
Determination of the Purity of Plasma Derivatives by Means of Agar Electrophoresis Using the Eri-lo-Densitometer.

381 Logan EF. Stenhouse A. Watt JG. Clark AE.
The Recovery of Immunoglobulin G From Horses by Combination of Selective Plasmapheresis and Forced Flow Electrophoresis.

383 Koenig R.
Nucleic Acids in the Potato Virus X Group and in Some Other Plant Viruses—Comparison of the Molecular Weights by Electrophoresis in Acrylamide-Agarose Composite Gels.

384 Matthaeus W.
Determination of the Electrophoretic Mobility of the Foot-and-Mouth Disease Virus in Agar Gel By Radioactivity Measurements.

402 Baumstark JS.
Pipetting Device for Preparation of the Second or Electrophoretic Stage of Peptide Maps.

418 Frater R.
Behavior of Ampholytes During Isoelectric Focusing.
SPECIAL TECHNIQUE

421 Sax SM. Moore JJ.
Computer Calculation of Serum Protein Electrophoresis, Based on Peak Height Measurements.

430 Salvaggio JE. Arguembourq PC. Sylvester GA.
A Comparison of the Sensitivity of Electroimmunodiffusion and Single Radial Diffusion in Quantitation of Immunoglobulins in Dilute Solution.

431 Larcan A. Stoltz JF. Niclause M. Streiff F.

438 Pfafflin W.
Experiences with Cellulose Acetate Foils in Immunoelectrophoresis.

441 Chlebarov S.
Electrophoretic Introduction of Allergens into the Skin.
(Allergenophoresis).

442 Zawadzki ZA. Edwards GA.
Pseudoparaproteinemia Due to Hypertrasferrinemia.

443 Schyma D. Taubert M.
Alginate-Electrophoresis- A Method for Fractionation and Isolation of Proteins.
Ger. Aerztl Forsch. 24, 326-30. 10 Nov 70.

485 Chamoles N. Karcher D.
Correlation Between the Classic Enzymogram of Lactate Dehydrogenase and its Fractionation by Isoelectric Focusing in Acrylamide Gel.

490 Hohenwallner W. Gabl F.
Comparability of Paper and Acetate Thin-Layer Electrophoresis.
Ger. Wien Lkin Wochenschr. 82, 809-11. 6 Nov 70.

509 Macko V. Stegemann F.
Free Electrofocusing in a Coil of Polyethylene Tubing.
Eng. Anal Biochem. 37, 186-90. Sep 70.

522 Davies DR. Spurr ED. Versey JM.
Some Modifications to the Technique of Two-Dimensional Immunoelectrophoresis.


SPECIAL TECHNIQUE

585  Skude G. Jeppsson JC.
Thin Layer Electrophoresis Followed by Electrophoresis in Antibody Containing Gel.

586  Johansson BG.
Agarose Gel Electrophoresis.

587  Grubb A.
Quantitative Determination of the Distribution of the Specific Antibodies of Antisera Subjected to Gel Electrophoresis.

589  Tung JS. Knight CA.
Relative Importance of Some Factors Affecting the Electrophoretic

597  Hyslop NS.
Application of an Improved System of Electrophoresis in Acrylamide Gel to Studies on the Sera of Different Species.

599  O'Connor ML.
Cerebrospinal Fluid Electrophoresis in MS.

605  Storch W. Hagert M. Trenckmann H. Kronberger H. Schuppel KF.
Immunoflourescence Microscopic and Immunelectrophoretic Studies with an Antiserum of Goats Against Human Myocardium.
Ger. Z Gesamte Inn Med. 27, 297-9. 1 Apr 72.

607  Ramsden DB.
The Use of Material Labelled with Soft-Emitters in the Laurell Immunelectrophoretic Technique.

609  Staynov D.
Mobility-Concentration Effects for RNA in Agar Gel Electrophoresis.

618  Almy RE. Ziegler FD.
A Modification of the Beckman Microzone Cell for Performance of Immunoosmophoresis on Agarose Coated Plates.

622  Gilson W. Gilson R. Rueckert RR.
An Automatic High-Precision Acrylamide Gel Fractionator.
SPECIAL TECHNIQUE

623 King JG.
The Microzone System. A Study on its Use in Hemoglobin Electrophoresis.

626 Jones RE. Hemmings WA. Fallk WP.
Ethylene Glycol as a Stabilizing Agent in Electrofocusing.

647 Griffith IP.
Immediate Visualization of Proteins in Dodecyl Sulfate-Polyacrylamide Gels by Prestaining with Remazol Dyes.

649 Kostner G. Holasek A.
Influence of Dextran and Polyethylene Glycol on Sensitivity of Two-Dimensional Immunoelectrophoresis and Electrimmunodiffusion.

650 Sommer H. Unglaub W.
The Importance of Buffer-Membrane Combinations on the Results of Cellulose Acetate Membrane Electrophoresis.

652 Schubert P. Kreutzberg GW. Lux HD.
Use of Microelectrophoresis in the Autoradiographic Demonstration of Fiber Projections.

663 Weiner AM. Platt T. Weber K.
Amino-Terminal Sequence Analysis of Proteins Purified on a Nanomole Scale by Gel Electrophoresis.

671 Reid PE. Culling CF. Livingstone DJ. Dunn WL.
Staining of Polymeric Carbohydrate Half Sulfate Esters with High Iron Diamine After Cellulose Acetate Electrophoresis.

672 Dominguez CJ. Civantos F. Di Bella J. Rywlin A.
Immunoelectrophoresis of Human Serum Proteins. Application to

675 Conway-Jacobs A. Lewin LM.
Isoelectric Focusing in Acrylamide Gels-Use of Amphoteric Dyes As Internal Markers for Determination of Isoelectric Points.
SPECIAL TECHNIQUE


SPECIAL TECHNIQUE

751 Oelshlegel FJ Jr. Brewer CJ.
New Positive, Tetrazolium-Linked, Staining Method for Use With
Electrophoresis of Phosphoglycerate Kinase.

755 Nedviga NN.
Method of Paper Electrophoresis.

761 Delincee H. Radola EJ. Drawert F.
Isoelectric Properties of Gama-Irradiated Horse-Radish Peroxidase.

772 Clotten R.
High-Voltage Electrophoresis.

773 Geyer H.
High-Voltage Electrophoresis of Enzymes.

774 Ellis DB.
The Use of High-Voltage Paper Electrophoresis in Studies of the
Biosynthesis of Mucin Glycoproteins.
Eng. J Chromatogr. 63,177-84. 9 Dec 71.

775 Clotten R.
Porphyrias. Separation and Identification by High-Voltage
Electrophoresis.
Eng. J Chromatogr. 63,185-91. 9 Dec 71.

789 Staynov DZ. Pinder JC. Gratzer WB.
Molecular Weight Determination of Nucleic Acids by Gel
Electrophoresis in non-Aqueous Solution.

800 Delincee H. Radola BJ. Drawert F.
The Effect of Heat on the Isoelectric and Size Properties of
Horseradish Peroxidase.

804 Ravi JM.
Detection of Hemoglobin S Utilizing sickledex Solubility, Reduced
Oxygen Tension, and Electrophoresis.
Sherbet GV., Lakshmi MS., Rao KV.
Characterisation of Ionogenic Groups and Estimation of the Net Negative Electric Charge on the Surface of Cells Using Natural PH Gradients.

Verbanov VS., Spasskii GA., Leont'ev VK.
Modification of the MF-4 Microphotometer for the Densitometry of Electrophoreograms on Polyacrylamide Gel.

Fawcett JS.
Continuous-Flow Isoelectric Focusing and Isotachophoresis.

Radila BJ.
Analytical and Preparative Isoelectric Focusing in Gel-Stabilized Layers.

Catsimpoolas N.
Immuno-Isoelectrofocusing.
Eng. Ann NY Acad Sci. 209, 144-6. 15 Jun 73.

Wellner D., Hayes MB.
Isoelectric Focusing in Polyacrylamide Gels.

Florini JR., Brivio RP., Battelle BA.
Isoelectric Focusing of Myosin and other Muscle Proteins in Polyacrylamide Gels.

Everaerts FM., Beckers JL., Verheggen TP.
Some Theoretical and Practical Aspects of Isotachophoretical Analysis.
Eng. Ann NY Acad Sci. 209, 419-44. 15 Jun 73.

Routs RJ.
The Choice of Electrolyte Conditions for Isotachophoretic Separations.

Chrambach A., Doerr P., Finlayson GR., Miles LE., Sherins R., Redbard D.
Instability of PH Gradients Formed by Isoelectric Focusing in Polyacrylamide Gel.
Eng. Ann NY Acad Sci. 209, 44-64. 15 Jun 73.

Vestermark A.
Determination of PH Differences Occurring During Isotachophoresis With Different Systems of Leading and Terminating Electrolytes.
SPECIAL TECHNIQUE

902 Radola BJ.

907 Secchi C.
A New Method for pH Determination in Isoelectric Focusing Experiments.

906 Williams JA. Brank JM. Bosman T.
Apparatus for Discontinuous Electrophoresis in Polyacrylamide Gel Slabs.

910 Schaffer HE. Johnson FM.
Constant (90ptimum) Power Electrophoresis.

911 Ressler N.
A Systematic Procedure for the Determination of the Heterogeneity and Nature of Multiple Electrophoretic Bands.

912 Brade W. Dietz H.
An Apparatus for Longitudinal and Transverse Gel Slicing.

913 Gainer H.
Isoelectric Focusing of Proteins at the 10 to 10^-G Level.

915 Beeley JA. Stevenson SM. Beeley JG.
Polyacrylamide Gel Isoelectric Focusing of Proteins—Determination of Isoelectric Points Using an Antimony Electrode.

939 Ghabrial SA. Lister RM.
Anomalies in Molecular Weight Determinations of Tobacco Rattle Virus Protein by SDS-Polyacrylamide Gel Electrophoresis.

942 Markowski B.
Quantification of 2-Dimensional Immunoelectrophoresis.

947 Datyner A. Finnimore E.
A New Staining Method for the Assay of Proteins of Polyacrylamide Gels.
SPECIAL TECHNIQUE

953 Tenforde T. Clarke EJ. Macgregor RD. Streibel MJ. Todd PW.
A Convenient Microelectrophoresis Assembly.

955 Furlong CE. Cirakoglu C. Willis RC. Santy PA.
A Simple Preparative Polyacrylamide Disc Gel Electrophoresis
Apparatus - Purification of Three Branched-Chain Amino Acid Binding
Proteins from Escherichia Coli.

958 Margolis J.
Practical System for Polyacrylamide Gradient Gel Electrophoresis.

959 Cann JR. Oates DC.
Theory of Electrophoresis and Sedimentation for Some Kinetically
Controlled Interactions.

970 Idu SM. Cociumian L.
Easily Installed Electrophoresis Chamber for Low Temperatures.

979 Schilling K. Horn A. Bornig H.
A Preparative Membrane Electrophoresis Apparatus Based on the Barrier
Principle for the Separation of Proteins in Gram Quantities.

982 Miller JN. Mutzelberg ID.
Kaurell Electrophoresis on Cellulose Acetate.

983 Fairbanks G. Avruch J.
Four Gel Systems for Electrophoretic Fractrophoretic Fractionation of Membrane
Proteins Using Ionic Detergents.

987 Jovin TM.
Multiphasic Zone Electrophoresis. 3. Further Analysis and New Forms
of Discontinuous Buffer Systems.
Eng. Biochemistry. 12,890-8. 27 Feb 73.

993 Lewis JH. Wilson JH. Brandon JM.
Counterelectrophoresis Test for Molecules Immunologically Similar
to Fibrinogen.

1007 Lewis JP. Neal WA. Welch ET. Lewis WG 3 D. Dubose CM Jr. Wright
CS. Smith LL.
The Isolation of Erythropoiesis Regulatory Factory by an
Electrofractionation Technique Combined with Selective Membrane
Permeability.
1011 Fredriksson S.
Scanning Isoelectric Focusing in Small Density Gradient Columns. II.
Microfractionation of Column Contents. Evaluation of PH Course.
Isoelectric Points of Lactoglobulins A and B.

1018 Soderholm J. Allestam P. Wadstrom T.
A Rapid Method for Isoelectric Focusing in Polyacrylamide Gel.

1021 Wallis C. Malnick JL.
Detection of Protein Contaminants in Biological Preparations by
Discontinuous Counterimmunoelectrophoresis.

1023 Abe S. Fujisawa T. Satake M. Ogata K.
Studies on SDS-Phenol Methods for Extraction of Rzt Liver Nuclear
RNA. II. Polyacrylamide Gel Electrophoresis of Nuclear RNA Obtained
Using Various Conditions for SDS-Phenol Extraction.

1028 Rizov B. Dimitrov D. Aleksieva A. Pashova E.
Studies on Serum Streptomycin Concentrations by Ingrauterine
Electrophoresis with Streptomycin.

1034 Tadokoro M. Boulpaep EL.
Electrophoretic Method Of Ion Injection in Single Kidney Cells.

1036 Grossbach U.
Microelectrofocusing of Proteins in Capillary Gels.

1038 Baehr R Von.
Combination of Preparative Agar Gel and Discontinuous Polyacrylamide
Gel Electrophoresis.
Ger. Z Gesamte Inn Med. 27,751-4. 1 Sep 72.

1043 Kiddy CA. Rollins RE. Zikakis JP.
Discontinuous Polyacrylamide Electrophoresis for Lactoglobulin
Typing of Cow's Milk.

1057 Freedman MH.
The Use of Preparative Liquid Isoelectric Focusing for the Further
Purification of Rabbit Antihapten Antibodies.

1058 Creason MT. Creason PL.
Alpha 1-Antitrypsin Immunoelectrophoresis.
SPECIAL TECHNIQUE

1059  Tykva R. Votruba I.
Estimation of Radioactivity in Electrophoresis Gels by a Scanning
Semiconductographic Procedure.

1060  Creighton MC. Trevithick JR.
Quantitative Rapid Separation of Histones on Cellogel Strips Using
Dansyl Chloride.

1081  Roberts RM. Jones JS.
Improved Apparatus for Vertical Gel Electrophoresis.

1106  Howery DG. Vermeulen T. Nady L.
Continuous-Flow Rectangular-Bed Electrophoresis.

1107  Taylor KJ. Newman DL.
Electrophoretic Mobility of Ehrlich Cell Suspensions Exposed to
Ultrasound of Varying Parameters.

1117  Diezel W. Liebe S. Kopperschlager G. Hofmann E.
Bovine Liver Catalase- Microheterogeneity and Enzyme Association.
IMMUNOLOGY

53 Bratthall D.
Immunodiffusion Studies on the Serological Specificity of Streptococci Resembling Streptococcus Mutans.

76 Kataoka T. Nojima S.
Immunoelectrophoresis of Rabbit Antisera Against Phospholipid Haptens.

90 Roding H. Muller U.
Evaluation of Electropherograms According to the 'Medium Information Content'.

92 Weeke B.
Quantitative Immunoelectrophoresis. Rocket Electrophoresis.
Dane. Ugeskr Laeg. 131,1419.23. 21 Aug 69.

111 Mohos JZ. Cseh E.

150 Cannon DC.
Immunoglobulin Analysis in Clinical Diagnosis. 2 Immunoelectrophoresis.

151 Rebeyrotte P. Koutsoukos A. Labbe JP.

170 Localization of the ICM-Fraction in Discontinuous Polyacrylamide Electrophoresis Columns.

183 Grasslin D. Czygan PJ. Weise HC.
Preparation of Highly Purified HCG Controlled by Gel Isoelectric Focussing.

298 Lee D. Marinkovich V. Robertson W Wan B.
Studies of the Binding of a Timothy Pollen Antigen by Sera and Serum Fractions of Atopic Individuals Using Acrylamide Gel Electrophoresis.
332 Jungfer H.
The Subgroups Lgg I, II and 3 of Human Immunoglobulins G. II.
Characterization of the Subgroups with Immunoelectrophoresis, Heat
Denaturation and Quantitative Complement Fixation Test.

404 Ghetie V. Cnica D.
Extent of Immunoglobulin Light Chains Heterogeneity Revealed by
Isoelectric Focusing.

738 Williamson AR.
Antibody Isoelectric Spectra. Analysis of the Heterogeneity of
Antibody Molecules in Serum by Isoelectric Focusing in Gel and
Specific Detection with Hapten.

771 Williamson AR.
Antibody Isoelectric Spectra. Analysis of the Heterogeneity of
Antibody Molecules in Serum by Isoelectric Focusing in Gel and
Specific Detection with Hapten.

785 Gilgenkratz S. Stoltz JF. Streiff F. Larcan A.
Study of Electrophoretic Mobility of Human Lymphocytes Before and
After in Vitro Culture.

786 Stoltz JF. Genetet B. Peirron N. Streiff F. Larcan A.
Influence of Blood Group Antibodies on Electrophoretic Mobility of
Blood Platelets.

936 Virella G. Freitas MM De.
Structural Characterization of Immunoglobulins Contained in
Polyacrylamide Gels.
Eng. Experientia. 29,142-4. 15 Feb 73.

962 Schuller E. Lefevre M. Tompe L.
Electroimmunodiffusion of
Eng. 2 M, Iga and Igm in Nanogram Quantities with a
Hydroxyethylcellulose-Agarose Gel- Application to Unconcentrated

969 Hughes-Jones NC. Gardner B.
Electrophoretic Precipitation and Radial Diffusion Methods for Assay
of Anti-D Immunoglobulin Preparations.

992 Karmanov MT.
Use of Immuno electrophoresis for the Control of the Purity of
Separation of Serum Immunoglobulins on Columns with Deae-Cellulose.
<table>
<thead>
<tr>
<th>Page</th>
<th>Reference</th>
</tr>
</thead>
</table>
| 994  | Komarmy L. Barnes MG.  
Separation of Globin Chains by Rapid Cellulose Acetate |
| 1044 | Josephson RV. Mikolajick EM. Sinha DP.  
Gel Isoelectric Focusing of Selected Bovine Immunoglobulins.  
| 1055 | Sxelsen NH. Book E.  
| 1085 | Zeiller K. Dolan L.  
Thymus Specific Antigen of Electrophoretically separated rat Lymphocytes. Tracting of the Differentiation Pathway of Bone Marrow-Derived Thymocytes by Use of a Surface Marker.  
| 1092 | Stephan W. Frahm U.  
Quantitative Simulaneous Immunoelectrophoresis. A Micromethod for The Simultaneous Determination of All Serum Proteins, Including the Immunoglobulins.  
REVIEW

87 Fateh-Moghadam A. Lamerz R.

90 Roding H. Muller U.
Evaluation of Electropherograms According to the "Medium Information Content."

111 Mohos JZ. Cseh E.

127 Matthaeus W.
Relative Mobility of Serum Proteins in Agar Gel Electrophoresis.
Ger. ZBL Veterinaermed B. 16,553-62. 6 Aug 69.

150 Cannon DC.
Immunoglobulin Analysis in Clinical Diagnosis. 2. Immunoelectrophoresis.

194 Fisher MP. Dingman CW.
Role of Molecular Conformation in Determining the Electrophoretic Properties of Polynucleotides in Agarose-Acrylamide Composite Gels.

263 Holper JC. Jambazian A.
Comparative Sensitivity of Complement Fixation, Counterimmunoelectrophoresis, Radial, and Double Diffusion for Detection of Australia Antigen.

265 Prochazka B. Barta V.
Determination of LDH Isoenzyme Pattern by Electrophoresis in Agar Gel Methodical Comparative Study.

268 Porath J.
Recently Developed Fractionation Methods.

291 Lyngbye J. Kroll J.
Quantitative Immunoelectrophoresis of Proteins in Serum from a Normal Population-Season-, Age-, and Sex-Related Variations.

302 Williams JG. Gratzer WB.
Limitations of the Detergent-Polyacrylamide Gel Electrophoresis Method for Molecular Weight Determination of Proteins.
312 Lunney J. Chrambach A. Rodbard D.
Factors Affecting Resolution, Band Width, Number of Theoretical Plates, and Apparent Diffusion Coefficients in Polyacrylamide Gel Electrophoresis.

317 Chrambach A. Rodbard D.
Polyacrylamide Gel Electrophoresis.

341 Englhardt A.
Elution Solutions for Electrophoresis.
Ger. Dtsch Med Wochenschr. 95,2256. 30 Oct 70.

356 Pesendorfer F. Krassnitzky O. Wewalka F.
Immunodiffusion and Immunelectrophoretic Techniques.

439 Koziner VB. Papush ND. Cherniak VIA.
Use of the Method of Free Electrophoresis in Determining the Elimination of Polyglucine from the Blood.

444 Polonovski C. Perrain MF. Desquilbet N.
Value and Limitations of Micro-Immunelectrophoresis of the Serum in Pediatrics. Study of 1300 Pathological Cases.

451 Dyberg J. Hjorne N.
Lipoproteinelectrophorese--Technic and Quantitation.

460 Thiele HG. Stark R.

481 Carruthers ME.
Flexible Electrophoresis Applicator for Use with the Autoanalyzer in Routine Protein Analysis.

487 Jennings RC. Brocklehurst D. Hirst M.
A Comparative Study of Alkaline Phosphatase Enzymes using Starch-Gel Electrophoresis and Sephadex Gel-Filtration with Special Reference to High Molecular Weight Enzymes.

511 Arcus AC.
Protein Analysis by Electrophoretic Molecular Sieving in a Gel of Graded Porosity.
Eng. Anal Biochem. 37,53-63. Sep 70.
REVIEW

512 Rothfus JA.
Newer Techniques in Protein Isolation and Characterization.

516 Krieg M. Weicker H.
The Immunologic Identification and Localization of Protein Fractions
Following Separation by Disc Electrophoresis on Polyacrylamide Gel.

572 Maurer HR. Allen RC.
Polyacrylamide Gel Electrophoresis in Clinical Chemistry- Problems of
Standardization and Performance.

590 Kapadia G. Chrambach A.
Recovery of Protein in Preparative Polyacrylamide Gel Electrophoresis.

811 Nerenberg ST. Demarco L. Granger C.
Rapid Large-Scale Screening of Blood Proteins by Use of Cellulose
Acetate Electrophoresis on a Solid Support.

839 Lange CF.
Advances in Electrophoretic and Chromatographic Technics.

842 Rible H.
Historical and Theoretical Aspects of Isoelectric Focusing.

852 Latner AL.
Some Clinical Biochemical Aspects of Isoelectric Focusing.

864 Strickler A. Sacks T.
Focusing in "Continuous-Flow" Electrophoresis Systems by Electrical
Control of Effective Cell Wall Zeta Potentials.

865 Toward A Unified Electrophoretic Viewpoint

903 Ravenni G.
Technical Progress in the Serum Electrophoresis.

909 Jonsson M. Pettersson S. Rilbe H.
Scanning Isoelectric Focusing in Small Density-Gradient Columns. I.
Use of a Standard Spectrophotometer Cuvette for Focusing. Chemical
Modification of Proteins by Migrating Reactive Ions.
933  Fike RM. Van Oss CJ.
Preparative Cell Electrophoresis.

1005  Angela GC.
Summary of Recent Data on the Evaluation and Interpretation of Electrophoretic and Immunelectrophoretic Tracings of Human Biologic Fluids in Normal Conditions and in Relationship to Various Morbid Situations.

1013  Keyser JW.
Immunoelectrophoresis--Applications and Recent Developments.

1031  Kiriukhin IF.
Electrofocusing in a Horizontal Apparatus.

1055  Axelsen NH. Bock E.
1. McCombs M. Bowman Bh.  
Demonstration of Inherited Ceruloplasmin Variants in Human Serum by Acrylamide Electrophoresis.  

6. Augier J. Augier-Giecry S.  
Analysis by Polyacrylamide Gel Isoelectric Focusing of Protein Fractions present in the purified Protein Derivatives (PPD).  

7. Aron E. Guttman N. Lamy Jn. Weill JD.  
Electrophoresis of Serum Proteins on a Polyacrylamide Gel. Application to Diagnosing Liver Cirrhosis.  

21. Moggi C. Frangini V. Pratesi C.  
Electrophoretic Behavior of the Serum Glycoproteins During Viral Hepatitis in Children.  

26. Frangini V.  
Behavior of Electrophoretic Fractions of Serum Glycoproteins in Children with Asthma. Radial Cellulose Acetate Gel Electrophoresis  

39. Sawada T. Dato K. Sato S.  
Studies on the Purification of Skin Test Antigen SST for the Diagnosis of Schistosomiasis Japonica. I. The Characterization and Purification of Antigen SST By Zone Electrophoresis and Gel-Filtration Technique.  

40. Lochmann D. Vymola F. Buda J. Pillich J.  
The Use of Electrophoresis for the Identification of Staphylococcal Toxins.  

57. Biguet J. Capron A Tran Van Ky P.  
Immunologic Diagnosis of Parasitoses.

59. Obiger G.  
Electrophoretic Analysis of D Group Streptococci Sera and Conjugates For Testing Their Activity in Serological Diagnosis.  
Ger. ZBL Bakt Orig. 210, 158-80. Jun 69.

60. Vernes A. Fruit J. Bouthemy F. Capron A.  
Indirect Immunofluorescence Applied to the Diagnosis of Bilharziasis Study of the Specificity of the Reaction on Frozen Sections and Comparison with Immunoelectrophoresis and Complement Fixation Technics.  
62 Diessner H.
The Diagnostic Significance of Polyacrylamide Electrophoresis in Neuropsychiatry.

65 Golubev Am
Electrophoretic Characteristics of Nonspecific Esterases in Blood Serum in Myocardial Infarct.

72 Herzog A. Bruns J.
Cell Electrophoretic Studies on Lymphocytes of Cows with Blood Pictures Compatible with or Suspicious for Leucosis.
Ger. Deutsch Tierarztl Wschr. 76,569-75. 1 Nov 69.

79 Terfloth HP.
Modified Technic of the Electrophoretic Separation of Erythrocyte Acid Phosphatase.

83 Zapletalek M. Tabarka K.
Atropine and Electrophoretic Test of Autonomic Tonic in Healthy Subjects.

105 Ricco G. Callo E. Mazza U. Bianco G. Prato V
The Starch Gel Quantitative Electrophoresis of Haemoglobin as Screening in the Thalassaemia Syndromes.

113 Hatanaka M. Twiddy E. Gilden R.
Electrophoresis of Adenovirus-Specified Thymidine Kinase.

114 Iuchi I. Miyake H.
Analysis of Serum Lipoproteins by Electrophoresis and Ultracentrifugation.

115 Kaplan MM. Rogers L.
Separation of Human Serum-Alkaline-Phosphatase Isoenzymes by Polyacrylamide Gel Electrophoresis.

117 Coulson Wf. Bender Da. Jepson JB.
Multiple Electrophoresis Peaks of Rat Liver Decarboxylases for 3,4-Dihydroxyphenylalanine and 5-Hydroxytryptophan.


193 Schaeffer J. Taft DM.
Rapid Screening for Australia Antigen Using Countercurrent Electrophoresis.

200 Urasawa S. Urasawa T. Kanamitsu M.
Radioimmunoelctrophoretic Identification of Poliovirus Inhibitors and Their Characteristic Mode of Action.

201 Forsgren M.
Immunoelectrophoresis of Poliovirus Antigens.

205 Honjo T. Nishizuka Y. Kato I. Hayaishi O.
Adenosine Diphosphate Ribosylation of Aminoacyl Transferase II and Inhibition of Protein Synthesis by Diphtheria Toxin.
Eng. J. Biol Chem. 246,4251-60. 10 Jul 71.

226 Dalziel N.
The Improved Detection of Paraproteinaemia by Routine Cellulose Acetate Electrophoresis.

247 Moggi C. Giovannucci ML. Calabri G. Berti S.
Behavior of Blood Proteins and Glycoproteins in the course of Meningocoocic Disease in Childhood (Sepsis and Meningitis) (Cellulose Acetate Gel Radial Electrophoresis).

252 Petithory J. Feillet M.
Diagnosis of Cysticercosis by Immunoelectrophoresis and the Ouchterlony Technic.
Fre. Encephale. 60,24-35. Jan-Feb 71.

261 Biguet J. Tran-Van-Ky P. Andrieu S. Vaucelle T.
Initial Characterizations of Enzymatic Activities on Immunoelectrophoregrams of Antigenic Extracts of Histoplasma Capsulata. Practical Diagnostic Results.

262 Danielei G. Montroni M. Piganta S.
Secondary Monolonal Gammopathies.
Ita. Haematologica. 55,668-71. 1970

272 Rapid Identification of Hepatitis Virus Using Counter-Current Immunoelectrophoresis.

276 Vergani C.
Crossover Electrophoresis for the Rapid Detection of Serum Hepatitis (Australia) Antigen and Antibody.
DIAGNOSIS


309 Theodore TS. Tully JG. Cole RM.  
Polyacrylamide Gel Identification of Bacterial L-Forms and Mycoplasma Species of Human Origin.  

327 Kostic A. Cvoric M. Suvakovic V. Tedeski-Cvilicevic B. Bajic V.  
Immunoelectrophoretic Studies and their significance in the followup of the Evolution of Acute Infectious Hepatitis.  

334 Gouring HD. Bonk U. Simon A. Nause I.  
Supplementary Facts on the Electrophoretic Demonstration of a Pregnancy-Specific Protein.  

343 Stamboliev PN.  
Immunoelectrophoretic Analysis of Serum During Development of Schizophrenia.  

355 Bleumink E. Young E.  
Studies on the Atopic Allergen in Hen's Egg. II. Further Characterization of the skin-Reactive Fraction in Egg-White-Immunoelectrophoretic Studies.  

357 Prince Am.  
The High Voltage Immunoelectrosomophoretic (IEOP) Technique for Detection of SH11 Antigen—Application to Blood Donor Screening and to Study of Liver Disease.  

358 Hansson BG. Kindmark CO. Johnsson T.  
Comparison Between the Immunoelectrosomopheresis and the Ouchterlony Precipitation Technique in Detecting Australia Antigen in Cases of Hepatitis.  

359 Thulstrup H. Dybkjaer E.  
Screening for Hepatitis Associated Antigen by Three Different Methods.  

367 Dorff GJ. Coonrod JD. Rytel MW.  
Detection by Immunoelectrophoresis of Antigen in Sera of Patients with Pneumococcal Bacteraemia.  
360 Biguet J. Fruit J. Vernes A. Capron A. 
Complement Fixation Test and Immunoelectrophoresis Applied to the 
Immunologic Diagnosis of Pulmonary Aspergillosis. 

374 Leonardy JG. 
Serum Protein Electrophoresis in Office Practice. 

392 Hsieh HS. Jaffe ER. 
Electrophoretic And Functional Variants of NADH-Methemoglobin 
Reducase in Hereditary Methemoglobinemia. 

395 Seidel D. 
A New Immunochemical Technique for a Rapid, Semi-Quantitative 
Determination of the Abnormal Lipoprotein (LP-X) Characterizing 
Cholesisias. 

396 Sachdev YR. Chandra H. Mathur YC. 
Serum Proteins Electrophoresis in Liver Diseases. 

397 Sobotka J. Tesarova-Vetchetova A. 
Clinical Importance of Determination of the Pre-Beta Lipoprotein 
Fraction with the Aid of Paper Electrophoresis. 

408 Lane D. 
The Early Detection of Gammopathies. 

409 Dinu IV. Hristea R. 
Uranyl-Resistant Paraproteins. Immunochemical Method of 
Identification of Pathological Protein Fractions. 
Rum. Med Interna (Bucur). 22,1063-70. Sep 70.

414 Selivanova KF. Gordeev IUN. Romaskevich AI. 
Microelectrophoresis of Protein Fractions of Blood Serum in 
Experimental Thyroid Toxicosis and Hypothyroidism. 

417 Whitehead PH. Kind SS. Morris PA. Davies M. Cleevley R. 
The Examination of Bloodstains by Laurell Electrophoresis 
(Antigen-Antibody Crossed Electrophoresis). 
Kindler U.
Lipoprotein Electrophoresis in the Diagnosis of Hyperlipoproteinemias.
Ger. Dtsch Med Wochenschr. 95, 1942. 18 Sep 70.

Eulitz M. Huhn D. Eulitz H.
Characterization of the Paraproteins from a Plasmacytoma With Osseous and Extraosseous Distribution.

Latner Al. Parsons ME. Skillen AW.
Isoelectric Focusing of Human Liver Alkaline Phosphatase.

Galdiero F. Tufano MA. Cerciello T.
Isoelectric Focusing of Clostridium Botulinum Type A Toxin.
Eng. Arch Mikrobiol. 74, 101-2. 21 Oct 70.

Kohn J.
Method For The Detection and Identification of Alpha Fetoprotein in Serum.

Spedding DJ.
Detection of Latent Fingerprints With 35802.

Oepen I.
Thin-Layer Starch Gel Electrophoresis for Determination of Phosphoglucomutase Types in Blood Traces.

Gurova AI.

Shapcott D. O'Brien C.
A Method for the Isolation of Insulin from Single Human Pancreas.

Mazurczak J. Woyciechowska J. Makuch-Korulska W. Tomankiewicz Z.
Immunoelectrophoretic Examinations of Serum Proteins in Patients With Multiple Sclerosis.

Bert G. Di Cossanc DL. Pecco P.
Capacity of Peripheral Blood Lymphocytes to Recognize a Specific Antigen. Usefulness of Cellular Electrophoresis.

Immunological Diagnosis of Parasitic Diseases.

Comparative Evaluation of the Technics of Immunodiffusion on Agar and Counter-Electrophoresis in the Detection of Australia Antigen

Subtyping of Hepatitis-Associated Antigen (HB-Ag)—Simplified Technique With Counter-electrophoresis.

Diagnosis of Bacterial Meningitis by Counterimmunoelectrophoresis.

High-Voltage Immunoelectroosmophoresis in Australia Antigen Screening Of Blood Donors.

Thin-Layer Isoelectric Focusing for Haemoglobin Screening and ITS


Electroosmophoretic Radioimmunoassay—Application to Hepatitis-Associated Antigen.

Use of Counter Immunoelectrophoresis for Determining Species of Blood in Stains.
602 Masi M. Dallacasa P.
Proteinuria in Childhood. II. Differentiation of Proteinurias on the Basis of Electrophoresis and Immunoelectrophoresis of Urinary Proteins, Plasma Protein Clearance and Determination of the Selectivity Index.

613 Kostner G. Holasek A. Schoenborn W. Fuhrmann W.
Immunochemical Study and Analytical Isoelectric Focusing of Serum of A Case of Tangier Disease.

619 Electro-Osmo-Immunodiffusion System for Detection of Australia Antigen and of Antibodies Against Australia Antigen

620 Lever JE.
Purification and Properties of a Component of Histidine Transport in Salmonella Typhimurium. The Histidine-Binding Protein J.

628 Jambazian A. Holper jC.
Rheophoresis- A Sensitive Immunodiffusion Method For Detection of Hepatitis Associated Antigen.

630 Angeloni G. Iacobelli S. Garcea N. Paparatti L. Bompiani A.

631 Tokarskaia ZB. Vedeneev VS.
Carbohydrate-Protein Relationship in Serum Electrophoretic Fractions In Pneumonia.

632 Murray-Lyon IM. Clarke HG. Mopherson K. Williams R.
Quantitative Immunoelectrophoresis of Serum Proteins in Cryptogenic Cirrhosis, Alcholic Cirrhosis and Active Chronic Hepatitis.

633 Hultbery B. Ookerman PA.
Artificial Substrates in the Assay of Acid Glycosidases.

635 Pringle RC. Ross CA. McMichael S.
Immunoelectro-Osmophoresis and Complement Fixation Tests for Detection of Hepatitis-Associated Antigen.
638 Milner LV. Dobie JL. Grobbelaar BG.
An Inhibition Crossover Electrophoresis Technic For the Detection of
Hepatitis-Associated Antigen.

640 Banffer Jr.
Demonstration of Precipitins Against a Treponemal Antigen By
Counter-Immunoelectrophoresis
Eng. Lancet. 1,996-7. 6 May 72.

641 Dreisler E. Hemmingsen L. Rotbol Pedersen L.
Protein and LDH-Isoenzyme Pattern of Urine From Patients With Acute
and Chronic Pyelonephritis Determined by Isoelectric Focusing and
Disc-Electrophoresis.

656 Sachdev YR.
Serum Protein Electrophoresis in Acute Infective Hepatitis.

658 Waehneldt TV. Mandel P.
Isolation of Rat Brain Myelin, Monitored by Polyacrylamide Gel
Electrophoresis of Dodecyl Sulfate-Extracted Proteins.

659 Otto S
Dilution-Comparative Immunoelectrophoresis for the Investigation of
Double Paraproteinaemias.

660 Becus T. Lukacs E. Frinou I.
Electrophoretic and Immunoelectrophoretic Studies in Multiple
Sclerosis.

668 Gunther J. Gundlach HJ. Meyer-Reinecker H.
Disk Electrophoresis Study of Serum Proteins in Experimental Allergic
Encephalomyelitis.

669 Butnariu J. Grosu M. Macarovici R.
Proteinemia and Electrophoretic Fractions of Serum Proteins in
Children with Bouillaud-Sokolski's Rheumatism.

670 Coonrod JD. Rytel MW.
Determination of Aetiology of Bacterial Meningitis by
Counter-Immunoelectrophoresis.
673 Petter O. Kipping D.
Immunoelectrophoretic Studies in Various Collagen Diseases in Dermatology.

679 Melish JS. Waterhouse C.
Concentration Gradient Electrophoresis of Plasma From Patients with Hyperbetalipoproteinemia.

681 Yarzabal LA. Capron A.
Contribution of Immunoelectrophoresis to the Immunologic Diagnosis of Hydatidosis.

682 Castagnari L. Sorice F.
Immunoprecipitation Tests in the Diagnosis of Human Hydatidosis.

694 Ziegenfuss JF Jr. Burka ER. Byrne EB.
Australia Antigen Detection by 'Sandwich' Counterelectrophoresis.

697 Porcelli G. Angelett M. Angeletti M. Marini-Bettolo GB.
Chromatographic and Electrophoretic Behavior of Chromogranine Obtained from Bovine and Equine Adrenal Medulla.

699 Yamate E. Nagata Y. Dohi Y. Tsuchiya T.
Testing Method of Australia Antigen and Antibody by Cross-Over Electrophoresis.

702 Castagnari L. Sorice F.
Electrophoretic Immunoprecipitation (Crossed Over Electrophoresis) In The Diagnosis of Human Hydatidosis. II.

704 Varga JM. Ceska M.
Characterization of Allergen Extracts by Gel Isoelectrofocusing and Radioimmunosorbent Allergen Assay. Allergens in Timothy Pollen (Phleum Pratense) Extracts-

707 Tanaka K. Mizuguchi N. Kimura N. Arima T. Yamazaki S.
Methodological Evaluation and Clinical Significance of Lipoprotein Fractionation by Filter Paper Electrophoresis, with Special Reference To Correlation Between Lipoprotein Patterns and Arteriosclerosis Acceleration Factors.


708 Sgouris TJ. 
The Detection and Quantitation of Diphtheria and Tetanus Antibodies 
In Human Plasma or Serum by Counterelectrophoresis. 

709 Wille LE. 
Pre-Beta-Lipoproteins in Healthy Persons. A study of 224 Subjects 
With Agarose Gel Electrophoresis. 

715 Urushizaki I. Kitago M. Fukuda M. 
Isoelectric Focusing of Liver and Spleen Ferritins of Rats. 

722 Ursyn-Neimoewicz W. 
Immunoelectrophoretic Patterns of Blood Serum Proteins and Especially 
The C-Reactive Protein in Tuberculous Patients in the Course of 
Treatment. 

725 Pedio G. Ruttner JR. 
Electrophoretic Changes of Serum and Virus Particles Type 'C' and 'A' 
In a Plasmyocytoma of Balb-C Mice. 

730 Dutton GR. Barondes SH. 
Macromolecular Behaviour of Gangliosides on Electrophoresis in Sodium 
Dodecyl Sulphate. 

735 Davis PJ. Handwerger BS. Gregerman RI. 
Thyroid Hormone Binding by Human Serum Prealbumin (TBPA). 
Electrophoretic Studies of Triiodothyronine-TBPA Interaction. 

736 Bechtel PJ. Pearson AM. Bodwell CE. 
Isoelectric Focusing of S- (4-Pyridylethyl)-L-Cysteine Myosin 
Components on Polyacrylamide Gel. 

744 Toneva V. 
Comparative Studies of the Aujeszky Virus and the Herpes Simplex 
Virus with the Immunoelectrophoresis Method. 
DIAGNOSIS

780 Pitcher PM.
Crossed Immunoelectrophoresis for the Identification of Fibrinogen Degradation Products.

784 Kojima M. Usui H. Ando T. Fukuda N. Matsumoto K.
Detection of Australia Antigen by Counter-Immunoelectrophoresis.

796 Remington JS. Gaines JD. Gilmer MA.
Demonstration of Candida Precipitins in Human Sera By Counter Immunoelectrophoresis.
Eng. Lancet. 1,413. 19 Feb 72.

797 Burghart-Czapinska M. Jarzebowska H. Czestochowska E.
Case of Waldenstrom's Macroglobulinemia with Atypical Serum Immunoelectrophoretic Pattern:
Pls. Pol Tyg Lek. 26,1744-6. 8 Nov 71.

798 Swanborg RH. Feldstein SR.
Molecular Weight of Encephalitogenic Protein by Electrophoresis in Sodium Dodecyl Sulfate (SDS)-Acrylamide Gels.

799 Arsov D. Guceva B. Hrisoho R. Calaroski I.
Immunoelectrophoretic Changes in Rheumatic Diseases.

801 Cuk V.
Electrophoretic Changes in Serum Proteins of Children with Rubeola.

802 Van KY PT. Biguet J. Vaucelle T. Frutt J.

806 Abdel-Aal MA. Sakr R. El-Hawary MF. Ibrahim MA.
Simple Agar Gel and Immuno Electrophoretic Studies on Serum Proteins in Nephritis and Nephrosis.

809 Torgyan S. Meretey K. Backhausz R.
Radioimmunological Studies in the Diagnosis of Thyroid Diseases.
814 Hoekstra J. Deinhardt F.
Counterv-Immunoelectrophoresis- Rapid Method for Detecting
Group-Specific Antigen and Antibodies Associated with Cncogenic
Ribonucleic Acid Viruses.

816 Mandel B.
Characterization of Type 1 Poliovirus by Electrophoretic Analysis.

817 Bodnar PN.
Changes in Immunoelectrophoresis Indices Under the Effects of
Anabolic Steroids in Patients With Diabetes Mellitus.

821 Hansson BG. Johnsson T.
Improved Technique for Detecting Australia Antigen By
Immunoelectroosmophoresis.

826 Bogdal J. Wiernikowski A. Urasinski I.
Importance of Electrophoretic Tests in the Assessment of Some Cases
of Hemorrhagic Diathesis.

832 Guillan RA. Hooker EV.
Zonal and Immunoelectrophoretic Patterns of Normal and Nephrotic
Renal Extracts- A Preliminary Study.

834 Micro-Crossover Electrophoresis for the Detection of Au-Sh-Antigen.

850 Vesterberg O.
Physicochemical Properties of the Carrier Ampholytes and Some
Biochemical Applications.

858 Wadstrom T.
Separation of Australia Antigen and Some Bacterial Proteins by
Isoelectric Focusing in Polyacrylamide Gels.

875 Axelsen NH.
Quantitative Immunoelectrophoretic Methods as Tools for a Polyvalent
Approach to Standardization in the Immunochemistry of Candida
Albicans.

876 Feldman SA. Du Olos T.
Diagnosis of Meningococcal Arthritis by Immunoelectrophoresis of
Synovial Fluid.
877 Cejka J. Fleischmann LE. 
Post-Globulin-Isolation and Physicochemical Characterization. 

878 Sweet GH. Wilson DE. Cerber JD. 
Application of Electroimmunodiffusion and Crossed 
Electroimmunodiffusion to the Comparative Serology of a Microorganism 
(histoplasma Capsulatum). 

885 Kyrikidou A. Kourea-Kremastinou T. Papaevangelou G. Vassiliadis P. 
Detection of Vaccinia Antigen and Antibody by 
Counterelectrophoresis. 

891 Kjellin KG. Vesterberg O. 
Thin Layer Isoelectric Focusing of Cerebrospinal Fluid Proteins. A 
Preliminary Report with Special Reference to the Diagnostic 
Significance in Multiple Sclerosis. 

892 Lindbak H. Scandsen S. Julsrud OJ. 
Agarose-Electrophoresis of Spinal Fluid. 

893 Ben-David M. Rodbard D. Bates RW. Bridson WE. Chrambach A. 
Human Prolactin in Plasma, Amniotic Fluid and Pituitary-Identity and 
Characterization by Criteria of Electrophoresis and Isoelectric 
Focusing in Polyacrylamide Gel. 
Eng. J Clin Endocrinol Metab. 36,951-64. May 73.

894 Sepulveda B. Aubanel M. Landa L. Velazquez G. 
Advances in the Counter-Immuno-electrophoresis Technic for the 
Serologic Study of Amebiasis. 

896 Rettenbacher F. 
Immuonelectrophoresis. Technique and Utilization. 

899 Gentilini M. Pinon JM. 
Value of Electrosyneresis (Or Immuno-Electro-Diffusion) on A 
Cellulose Acetate Membrane in Hydatidosis Diagnosis. Comparative 
Study With Other Precipitation Tests.

900 Kimble CE. Anderson AW. 
Rapid, Sensitive Assay for Staphylococcal Enterotoxin A By Reversed 
Immuno-Osmophoresis. 

904 Kazarian AA. 
Study of the Tissue Autoantibodies and Serum Protein Fractions 
in Periodic Disease. 
Jeansson S. Vesterberg O. Wadstrom T.
Separation of Australia Antigen by Isoelectric Focusing in Acrylamide Gel.

Eder G. Molinari E.
Standardization of Au-Sh-HA Antigen and AU-SH-HA Antibody in Crossover-Electrophoresis.

Cohen E. Buchmeyer K.

Jarosch K.
Comparative Studies of Pulmonary Edematous Fluid and Serum in the Phrogram and Immunoelectrophoresis.

Prokop O. Rackwitz A.
Further Data on the Alpha 2-M-Feature of Children's Sera.

Conti-Diaz IA. Somma-Moreira RE. Gezuele E. De Gimenez AC. Pena MI. Mac Kinnon JE.
Immunoelectroosmophoresis-Immunodiffusion in Paracoccidioidomycosis.

Yarzabal LA. Luz S DA. Josef M. Torres JM. Vigna I. Muras O.
Immunoprecipitation Tests in the Diagnosis of Aspergillosis.

Morse DR. Patnik JW. Schacterle GR.
Electrophoretic Differentiation of Reacicular Cysts and Granulomas.

Davis GL Jr. Davis JS 4th.
Detection of Circulating DNA by Counterimmunoelectrophoresis (CIE).

Rhone DP. Mizuno FM.
Profiles of Alkaline Phosphatase Isoenzymes in Serum Using Cellulose Acetate Electrophoresis and Organ-Specific Inhibitors.

Tripodi D. Hawk J. Gooke DJ. Redeker A. Starkovsky NA.
Detection of Antibody to Hepatitis-Associated Antigen by Indirect Counterimmunoelectrophoresis.


DIAGNOSIS

963 Geserick G.
Demonstration of Hepatitis-Associated Antigen (Au-SH)- Various Methodological Aspects of Immunoprecipitation Technics.

965 Stratton F. Rawlinson VI. Gunson HH. Phillips PK.
The Role of Zeta Potential in RH Agglutination.

972 Klossner mL. Willman K.
Latex Test, Complement Fixation, and Immunoelectroosmophoresis in Detection of Australia Antigen.
Eng. Lancet. 1,322-3. 10 Feb 73.

975 Matsuda S. Sukeno N. Ishida N.
Different Types of Australia Antigen Detected by Radioimmunoassay and Immunoelectroosyneresis.

980 Janicki BW. Aron SA. Berson AS.
Technical Factors Affecting an Immunoelectrophoretic Reference System for Analysis of Mycobacterial Antigens.

984 Dreesman GR. Hollinger FB. Melnick JL.
Detection of Hepatitis B Antigen by Counter-Immunoelectrophoresis-Enhancing Role of Homologous Serum Diluents.

998 Ingram DL. Anderson P. Smith DH.
Countercurrent Immunoelectrophoresis in the Diagnosis of Systemic Diseases Caused by Hemophilus Influenzae Type B.

1000 Yamaoka K. Ota Y. Seita M.
Thin Layer Starch Gel Electrophoresis.

1004 Fossieck B Jr. Craig R. Paterson PY.
Counterimmunoelectrophoresis for Rapid Diagnosis of Meningitis Due to Diplococcus Pneumoniae.

1008 Laurell CB.
Electrophoresis, Specific Protein Assays, or Both in Measurement of Plasma Proteins.

1014 Ceska M.
Characterization of Allergen Extracts by Dose-Response Studies and by Polyacrylamide Gel Isoelectrofocusing Using the Paper Disc Radioallergosorbent Test as the Assay Method. 3. Horse Dandruff Allergen.
1017 Hopkins R. Das PC.
Improved Sensitivity of the Electrophoresis Method by Tannic Acid for Detection of Australia Antigen

1022 Roberts DB. Wright CL Jr. Affronti LF. Reich M.
Characterization and Comparison of Mycobacterial Antigens by Two-Dimensional Immunoelectrophoresis.

1040 Hacker EJ Jr. Aach RD.
Detection of Hepatitis-Associated Antigen and Anti-HAA. Comparison of Radioimmundassay and Counterimmunoelectrophoresis.
Eng. JAMA. 223, 414-7. 22 Jan 73.

1047 LA Caver A
Medicolegal Identification of Blood Stains by Means of Precipitating Serums.

1049 Castilla J. Villanueva E. Gisbert-Calabuig JA.
Analysis of Haptoglobin Types by Means of Acrylamide Gel Disk Vertical Electrophoresis. Application to the Diagnosis of Blood Stains.

1052 Mazzur S.
The Detection of Australia Antigen by Immunodiffusion and Counterimmunoelectrophoresis.

1051 Lobanov MM. Rozengart VI. Rubina KNm
Electrophoretic and Chromatographic Characteristics of Different Forms of Human Serum Cholinesterases.

1053 Janicki BW. Aron SA. Raychaudhuri A.
Separation and Isolation of Mycobacterial Antigens by Continuous-Flow Electrophoresis.

1054 Fletcher PL Jr. Hash JH.
Ribonuclease of Chalaropsis Species. I. Isolation and Physical Properties.
Eng. Biochemistry. 11, 4274-80. 7 Nov 72.

1056 Svendsen J. Axelsen NH.
A Modified Antigen--Antibody Crossed Electrophoresis Characterizing The Specificity and Titre of Human Precipiting Against Candida Albicans.


1099 Hoffmeister H. Schutt KH.  
Diagnostic Utilization of Polyacrylamide Electrophoresis.  

1100 Tobin RM. Jones DM.  
Immunoelectroosmophoresis in the Diagnosis of Meningococcal Infections.  

1101 Grunbaum BW.  

1104 Zuidweg MH. Bus CJ. Welzer P. Van.  
Proteolytic Components of Alkaline Proteases of Bacillus Strains.  
Zymograms and Electrophoretic Isolation.  

1108 Lewis JH. Coram JE.  
Australin Antigen Detection. Comparison of Results Obtained with Five Cep and One RIA Test Systems.  

1113 Maisin J. Couvreur P. Ochrymowicz IP. Van Duyse E.  
Electrophoretic Pattern of Sera of Normal and Cancer Patients.  

1121 Lajolo DI Cossand D.  
Use of Some Immunological Technics in Clinical Diagnosis.  

1122 Barnes MG. Komarmy L. Wardlow SC. Kerson R.  
A Simple Electrophoretic Apparatus for Rapid Hémoglobin Screening.  

1123 Schmidt NJ. Lennette EH.  
Evaluation of Various Antisera and Gels for Detection of Hepatitis-Associated Antigen by Immunodiffusion and Immunoelectroosmophoresis Tests.  

1130 Gentilini M. Pinon JM. Michel G.  
Immunoelectrodiffusion on a Cellulose Acetate Membrane- Application To Parasitology (Preliminary Results of 600 Experiments).  

1131 Gold JM. Freedman SC. Gold P.  
Human Anti-CEA Antibodies Detected by Radioimmunoelectrophoresis.  
CELLULAR SEPARATION


Winterhoff D. Drewitz B.
Method of Electrophoresis of 10MG Liver Tissue on Cellulose Acetate Strips.

Thobe J. Seiler N. Werner G.
Electrophoresis in a Carrier-Free Buffer Stream. 3. A Simple Apparatus for the Optical Evaluation of Numerous Samples Simultaneously.

Hantschel H.
Determination of the Size of Viruses using Gel Electrophoresis.

Roubaud P.
Definition of a Method of Histobiochemical Analysis--Making of Ordered Clusters of Microtubes with Semi-Permeable Walls Intended for Electrophoresis on Cluster.

Pistenma DA. Mel HC. Snapir N.
Biophysical Characterization of Fowl Spermatozoa. II. Interrelationships between Intrinsic Motility and Electrophoretic Mobility

Richards EG. Lecanidou R.
Quantitative Aspects of the Electrophoresis of RNA in Polyacrylamide Gels.

Dasqupta S. Kung-Ho C.
Electrophoretic Analysis of Cell Populations in Presumptive Epidermis of the Frog, Rana Pipiens.

Streiff F. Stoltz JF. Genetet B. Humbert JC.
Electrophoretic Mobility of Human Lymphocytes. Determination of Phi and Effect of Cytotoxic Antibodies.

Lemp JF Jr. Ashbury ED. Ridenous EO.
Electrophoresis of Colloidal Biological Particles.

Elsayed S. Aas K.
Isolation of Purified Allergens (Cod) by Isoelectric Focusing.
363 Johns EW. Forrester S.
The Identification of the Five Main Histone Fractions by Comparative Electrophoresis in Polyacrylamide Gel.

373 Gorovsky MA.
Studies on Nuclear Structure and Function in Tetrahymena Pyriformis.
3. Comparison of the Histones of Macronuclei and Micronuclei by Quantitative Polyacrylamide Gel Electrophoresis.

379 Salach JI. Turini P. Seng R. Hauber J. Singer TP.
Phospholipase A of Snake Venoms. I. Isolation and Molecular Properties of Isoenzymes from Naja JAJA and Vipera Russellii Venoms.

398 Theodore TS. Tully JG. Cole RM.
Polyacrylamide Gel Identification of Bacterial L-Forms and Mycoplasma Species of Human Origin.

420 Sass NL. Martin WG.
Separation of Sulfated Nucleotides using Polyacrylamide Gel Electrophoresis.
Eng. Anal Biochem. 38,559-64. Dec 70.

423 Belokon AN. Popov MP. Gubarev EA. Lakin KM. Efimov VS.
Device for the Determination of the Electrophoretic Mobility of Cellular Blood Elements.

424 Karppinen K. Halomen PI.
Red Cell and Platelet Electrophoresis in Coronary Heart Disease.

425 Balbierz H. Nikolajczuk M.
Immunoelectrophoretic Analysis (IEA) of Bull Semen Plasma (BSP).

447 Hicki N. Kuragane K.
Fractionation of Thyroid Hormone Binding Protein by Polyacrylamide (PAA)-Ultramacro-Gel Electrophoresis.

450 Caspary EA. Knowles M.
Effect of Haemagglutinating and Mitogenic Fractions of Phytohaemagglutinin on Electrophoretic Mobility of Lymphocytes and Macrophages.
TEISBERG P.
High Voltage Agarose Gel Electrophoresis in the Study of C 3 Polymorphism.

FOSSARD C. DALE G. LATNER AL.
Separation of the Proteins of Cerebrospinal Fluid using Gel Electrofocusing Followed by Electrophoresis.

SRAUS EG. KAESBERG P.
Acrylamide Gel Electrophoresis of Bacteriophage Q Beta-Electrophoresis of the Intact Virions and of the Viral Proteins.

SINGH J. WASSERMAN AR.
Detection of Aggregation and Non-Destructive Disaggregation of Membranous Proteins using Polyacrylamide Gel Electrophoresis with Non-Ionic Detergents.
Eng. Biochim Biophys Acta. 221,379-82. 17 Nov 70.

KEMP RB. JONES BM.
Aggregation and Electrophoretic Mobility Studies on Dissociated Cells.
I. Effects of P-Benzoinique and Tannic Acid.

JONES BM. KEMP RB.
Aggregation and Electrophoretic Mobility Studies on Dissociated Cells.
II. Effects of ADP and ATP.

RAZIN S. VALDESUSO J. PURCELL RH. CHANOCK RM.
Electrophoretic Analysis of Cell Proteins of T-Strain Mycoplasmas Isolated from Man.

HASLAM EA. HAMPSON AW. EGAN JA. WHITE DO.
The Polypeptides of Influenza Virus. II. Interpretation of Polyacrylamide Gel Electrophoresis Patterns.

LESNAW JA. REICHMANN ME.
Determination of Molecular Weights of Plant Viral Protein Subunits by Polyacrylamide Gel Electrophoresis.

WINTERS WD. BROWNSTONE A. PEREIRA HG.
Separation of Adenovirus Penton Base Antigen by Preparative Gel Electrophoresis.
534  Favlik I.  
Principles of Microbial Electrophoresis.  
Che. Cas Lek Cesk. 109,981-5. 9 Sep 70.

537  Narurkar MV. Narurkar I.M. Sahasrabudhe MB.  
A New Technique of PH Gradient Electrophoresis as Applied to the  
Separation of Nucleic Acid Bases.  

544  Bont WS. Geels J. Rezelman G.  
An Apparatus for Preparative Polyacrylamide Electrophoresis--The Isolation  
of a Ribonuclease Inhibitor.  

546  Ibrahim AN. Sweet BH.  
Application of Immunodiffusion Methods for Typing Members of the  
Phelbotomus Group of Arboviruses.  

548  Hill BJ. Baxby D. Douglas HW.  
Microelectrophoresis of Enzyme and Chemically Treated Viruses and Cores  
of Vaccinia, Buffalopox, Variola and Alastrim.  

551  Greene EL. Halbert SP. Jequier S.  
Analysis of the Tissue Liver Constituents and Enzymes of Human Liver by  
Crossed Immunoelectrophoresis--Comparison of Normal and Cystic Fibrosis.  

565  Rice RH. Horst J.  
Isoelectric Focusing of Viruses in Polyacrylamide Gels.  

588  Klibansky C.  
Separation of N-Acetyl-D-Hexosaminidase--Isoenzymes from Human Brain  
and Leukocytes by Cellulose Acetate Paper Electrophoresis-- A Simple Procedure  
for the Diagnosis of Tay-Sachs Disease.  

612  Koyanagi Y. Hara M. Inoue T. Goara K.  
Isolation of Antigenic Component Specific for Human Seminal Plasma--  
"Seminoprotein (-SM)" by Electrofocusing. Forensic Immunological Study  
of Body Fluids and Secretions. 8.  

616  Minderhoud JM. Smith JK.  
Immunological Activity of Blood Lymphocyte Fractions. A Study by the  
Macrophage Electrophoretic Mobility Method.  
745 Field EJ.
Delayed Hypersensitivity Studies--Some Applications of Cell Electrophoresis.

752 Barengo E. Itoiz JE.
Rapid Quantitative Evaluation of Serum LDH Isoenzyme Patterns After Agar Gel Electrophoresis.

753 Lepri L. Desideri PG. Coas V.
Chromatographic and Electrophoretic Behavior of Purines and Pyrimidines on Layers of Weak and Strong Cation Exchangers.
Eng. J Chromatogr. 64,271-84. 2 Feb 72.

770 Zeiller K. Liebich HG. Hannig K.
Free-Flow Electrophoretic Separation of Lymphocytes. Two Thoracic Duct Lymphocyte Subpopulations Studies after Prolonged Cannulation and Immunization.

782 Maffezzoli RD. Kaplan GN. Chrambach A.
Fractionation of Immunoreactive Human Chorionic Gonadotropin and Luteinizing Hormone by Isoelectric Focusing in Polyacrylamide Gel.

788 Grigor'ev RN. Stepanova LA. Vorobeichikov VM.
Methods of Electrophoretic Concentration of Mycobacterium Tuberculosis.

814 Hoekstra J. Deinhardt F.
Counter-Immunoelectrophoresis--Rapid Method for Detecting Group-Specific Antigen and Antibodies Associated with Oncogenic Ribonucleic Acid Viruses.

869 Guarriero-Bobyleva V. Volpi-Becchi MA. Masini A.
Parallel Partial Purification of Cytoplasmic and Mitochondrial Aconitate Hydratases from Rat Liver.
Eng. Eur J Biochem. 34,455-8. 2 May 73.

895 Stahn R. Maier KP. Hannig K.
A New Method for the Preparation of Rat Liver Lysosomes. Separation of Cell Organelles of Rat Liver by Carrier-Free Continuous Electrophoresis.

908 Shimada K. Sekikawa K. Fujinaga K. Ito Y.
A New Device of Preparative Polyacrylamide Gel Electrophoresis and Its Application to Analysis of Cellular RNA.
Krichevskaia AA. Lukash AI. Sherstnev KB. Separation of Brain Proteins by a Combination of Isoelectric Focusing and Polyacrylamide Gel Electrophoresis. Rus. Dokl Akad Nauk SSSR. 209,1454-6. 21 Apr 73.


1114 Paine PL. Feldherr CM.
Nucleocytoplasmic Exchange of Marcomolecules.

1115 Hiramatsu A. Ouchi T.
A Neutral Proteinase from Streptomyces Naraensis. 3. An Improved Purification and Some Physiochemical Properties.

1118 Smeds S. Bjorkman U.
Micro-Scale Protein Separation by Electrophoresis in Continuous Poly-acrylamide Concentration Gradients.

1119 Vestermark A. Sjodin B.
Isotachophoresis Used Alone or in Two-Dimensional Combination with Zone Electrophoresis for the Small-Scale Isolation of Labelled Ribulose-1,5-diphosphate.

1126 Caspary EA. Field EJ.
Electrophoretic Slowing of Senstized Lymphocyte-Macrophage Mixtures-A Cellular Technique in Immunochemistry.
APPENDIX 4

STUDIED DURING PERFORMANCE OF THIS EVALUATION

(Reference numbers refer to Medlar Search)
<table>
<thead>
<tr>
<th>Substance Analyzed</th>
<th>Reference Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-Component from Bovine Insulin</td>
<td>872</td>
</tr>
<tr>
<td>ABO Antigens on Human Lymphocytes</td>
<td>615</td>
</tr>
<tr>
<td>Abnormal Lipoprotein (LP-X)</td>
<td>395</td>
</tr>
<tr>
<td>Abnormal Fibrinogens</td>
<td>580</td>
</tr>
<tr>
<td>Acid Alpha L-Glycoprotein</td>
<td>121</td>
</tr>
<tr>
<td>Abnormal Factor X</td>
<td>1074</td>
</tr>
<tr>
<td>Acid Phosphatases</td>
<td>1093</td>
</tr>
<tr>
<td>Acidic Glycines</td>
<td>791</td>
</tr>
<tr>
<td>Aconitase</td>
<td>653</td>
</tr>
<tr>
<td>Acute Infectious Hepatitis</td>
<td>327</td>
</tr>
<tr>
<td>Acyl Phosphatase</td>
<td>389</td>
</tr>
<tr>
<td>Adenosine Deaminase Gene</td>
<td>514</td>
</tr>
<tr>
<td>Adenovirus Penton Base Antigen</td>
<td>503</td>
</tr>
<tr>
<td>Adenovirus-Specified Thymidine Kinase</td>
<td>113</td>
</tr>
<tr>
<td>Albumin</td>
<td>339</td>
</tr>
<tr>
<td>African Swine Fever-Antibody</td>
<td>550</td>
</tr>
<tr>
<td>Alcohol Dehydrogenase Isozymes</td>
<td>608</td>
</tr>
<tr>
<td>Aldehyde Dehydrogenase</td>
<td>690</td>
</tr>
<tr>
<td>Alkaline Phosphatase Enzymes</td>
<td>487</td>
</tr>
<tr>
<td>Alkaline Phosphatase Isoenzymes</td>
<td>937</td>
</tr>
<tr>
<td>Alkaline Proteases</td>
<td>1112</td>
</tr>
<tr>
<td>Alkaloid Mixtures</td>
<td>1104</td>
</tr>
<tr>
<td>Allergen Extracts</td>
<td>456</td>
</tr>
<tr>
<td>Allergens</td>
<td>441</td>
</tr>
<tr>
<td>Allergens</td>
<td>704</td>
</tr>
<tr>
<td>Alpha-Feto-Protein</td>
<td>138</td>
</tr>
<tr>
<td>Alpha-Lipoproteins</td>
<td>244</td>
</tr>
<tr>
<td>Alpha-Mannosidase</td>
<td>577</td>
</tr>
<tr>
<td>Alpha 1</td>
<td>1058</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Alpha 2-M-Feature</td>
<td>922</td>
</tr>
<tr>
<td>ALS and Prednisolone</td>
<td>16</td>
</tr>
<tr>
<td>Amebiasis</td>
<td>894</td>
</tr>
<tr>
<td></td>
<td>961</td>
</tr>
<tr>
<td></td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>740</td>
</tr>
<tr>
<td></td>
<td>930</td>
</tr>
<tr>
<td></td>
<td>452</td>
</tr>
<tr>
<td></td>
<td>713</td>
</tr>
<tr>
<td>Amino Acid Patterns in Blood Serum</td>
<td>84</td>
</tr>
<tr>
<td>Aminocetyl Transferase</td>
<td>205</td>
</tr>
<tr>
<td>Amino Groups in Chymotrypsinogen A</td>
<td>313</td>
</tr>
<tr>
<td>Aminopeptidases of Basidomycetes</td>
<td>1069</td>
</tr>
<tr>
<td>Amphetamine Isomers</td>
<td>556</td>
</tr>
<tr>
<td>Ampholines</td>
<td>418</td>
</tr>
<tr>
<td></td>
<td>845</td>
</tr>
<tr>
<td>Aminolytes</td>
<td>197</td>
</tr>
<tr>
<td>Amylase-Starch</td>
<td>196</td>
</tr>
<tr>
<td>Angiotensin I Converting Enzyme</td>
<td>594</td>
</tr>
<tr>
<td>Antibody</td>
<td>738</td>
</tr>
<tr>
<td></td>
<td>1055</td>
</tr>
<tr>
<td>Antibody-Sensitized Red Cells</td>
<td>741</td>
</tr>
<tr>
<td>Anti-D Immunoglobulin</td>
<td>211</td>
</tr>
<tr>
<td></td>
<td>969</td>
</tr>
<tr>
<td>Anti-Estradiol Antibodies</td>
<td>225</td>
</tr>
<tr>
<td>Anti-Gamma G-Globulin Blood Stains</td>
<td>464</td>
</tr>
<tr>
<td>Antigenic Extracts of Aspergillus Flavus</td>
<td>802</td>
</tr>
<tr>
<td>Antigens</td>
<td>1055</td>
</tr>
<tr>
<td>Antigens of Trichinella Spiralis Larvae</td>
<td>27</td>
</tr>
<tr>
<td>Antihapten Antibodies</td>
<td>1057</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Anti-Lymphocyte Serum</td>
<td>48</td>
</tr>
<tr>
<td>Apoproteins</td>
<td>854</td>
</tr>
<tr>
<td>Arginase Isoenzymes</td>
<td>209</td>
</tr>
<tr>
<td>Arginine Esterase</td>
<td>596</td>
</tr>
<tr>
<td>Arginine-Rich Histones</td>
<td>981</td>
</tr>
<tr>
<td>Aromatic Amines</td>
<td>370</td>
</tr>
<tr>
<td>Arteriosclerosis</td>
<td>707</td>
</tr>
<tr>
<td>Aspartate Aminotransferase Isoenzymes</td>
<td>1002</td>
</tr>
<tr>
<td>Aspartate and Alanine Aminotransferase</td>
<td>698</td>
</tr>
<tr>
<td>Aspergillosis</td>
<td>927</td>
</tr>
<tr>
<td>Aspergillus Niger Beta-D-Xylosidase</td>
<td>242</td>
</tr>
<tr>
<td>Aspergillus Precipitins</td>
<td>946</td>
</tr>
<tr>
<td>Atopic Allergen in Hen's Egg</td>
<td>353</td>
</tr>
<tr>
<td>Atopic Individuals</td>
<td>298</td>
</tr>
<tr>
<td>Aujeszky Virus</td>
<td>744</td>
</tr>
<tr>
<td>Australia Antigen</td>
<td>193</td>
</tr>
<tr>
<td>Autoantibodies</td>
<td>289</td>
</tr>
<tr>
<td>Autoradioimmunoelectrophoresis</td>
<td>308</td>
</tr>
<tr>
<td>Avian Ribonucleic Acid Tumor Virus Group-Specific Antigens</td>
<td>263</td>
</tr>
<tr>
<td>Bacteriophage DNA</td>
<td>358</td>
</tr>
<tr>
<td>Bacterial L-Forms and Mycoplasma</td>
<td>904</td>
</tr>
<tr>
<td>Bacteriophage Q Intact Virions and Viral Proteins</td>
<td>460</td>
</tr>
<tr>
<td>Beagle Serum Proteins</td>
<td>762</td>
</tr>
<tr>
<td>Beta-Glucuronidase in Human Sera</td>
<td>637</td>
</tr>
<tr>
<td>Beta-Hemolytic Streptococcus</td>
<td>398</td>
</tr>
<tr>
<td>Beta-1-C Fraction</td>
<td>467</td>
</tr>
<tr>
<td>Beta 2-Glycoprotein</td>
<td>257</td>
</tr>
<tr>
<td></td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>145</td>
</tr>
<tr>
<td></td>
<td>835</td>
</tr>
<tr>
<td></td>
<td>278</td>
</tr>
<tr>
<td></td>
<td>121</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Bilharziasis</td>
<td>555</td>
</tr>
<tr>
<td>Biologically Active Hormone</td>
<td>166</td>
</tr>
<tr>
<td>Blastokinin</td>
<td>728</td>
</tr>
<tr>
<td>Blastokinin Amino Acid Composition</td>
<td>606</td>
</tr>
<tr>
<td>Blood Coagulation Factors</td>
<td>37</td>
</tr>
<tr>
<td>Blood Donor Screening</td>
<td>357</td>
</tr>
<tr>
<td>Blood Lymphocyte Fractions</td>
<td>616</td>
</tr>
<tr>
<td>Blood Platelets</td>
<td>466</td>
</tr>
<tr>
<td>B Cells</td>
<td>677</td>
</tr>
<tr>
<td>Blood Plasma and Lymph</td>
<td>178</td>
</tr>
<tr>
<td>Blood Proteins</td>
<td>127A</td>
</tr>
<tr>
<td></td>
<td>247</td>
</tr>
<tr>
<td></td>
<td>248</td>
</tr>
<tr>
<td></td>
<td>249</td>
</tr>
<tr>
<td>Blood Serum Albumin</td>
<td>366</td>
</tr>
<tr>
<td>Blood Stains</td>
<td>1047</td>
</tr>
<tr>
<td>Bone Marrow Cells</td>
<td>678</td>
</tr>
<tr>
<td>Bovine Allantoic Fluid</td>
<td>165</td>
</tr>
<tr>
<td>Bovine Corneal Epithelium</td>
<td>130</td>
</tr>
<tr>
<td>Bovine Milk Caseins</td>
<td>1024</td>
</tr>
<tr>
<td>Bovine Serum Proteins</td>
<td>139</td>
</tr>
<tr>
<td>Brain Acetylcholinesterase</td>
<td>954</td>
</tr>
<tr>
<td>Brain Myelin</td>
<td>658</td>
</tr>
<tr>
<td>Brain Proteins</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>928</td>
</tr>
<tr>
<td></td>
<td>952</td>
</tr>
<tr>
<td></td>
<td>428</td>
</tr>
<tr>
<td>Brucella Sonic Extract</td>
<td>326</td>
</tr>
<tr>
<td>Brucella Species</td>
<td>325</td>
</tr>
<tr>
<td>Bull Semen Plasma</td>
<td>425</td>
</tr>
<tr>
<td>Candida</td>
<td>796</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Candida Albicans</td>
<td>875</td>
</tr>
<tr>
<td></td>
<td>1056</td>
</tr>
<tr>
<td>Candida Antigens</td>
<td>945</td>
</tr>
<tr>
<td>Carbohydrate Half Sulphate Esters</td>
<td>671</td>
</tr>
<tr>
<td>Carbohydrate Protein</td>
<td>631</td>
</tr>
<tr>
<td>Carbonic Anhydrase Isozymes</td>
<td>1089</td>
</tr>
<tr>
<td>Carnitine Palmitoyltransferase</td>
<td>288</td>
</tr>
<tr>
<td>Carrier Ampholytes</td>
<td>850</td>
</tr>
<tr>
<td>Carrier Proteins</td>
<td>446</td>
</tr>
<tr>
<td>Cell Electrophoresis</td>
<td>745</td>
</tr>
<tr>
<td>Cell Organelles</td>
<td>895</td>
</tr>
<tr>
<td>Cell Proteins</td>
<td>693</td>
</tr>
<tr>
<td>Cellular Antigens in Myxo- and Paramyxoviruses</td>
<td>505</td>
</tr>
<tr>
<td>Cellular Blood Elements</td>
<td>423</td>
</tr>
<tr>
<td>Cellular Electrophoresis</td>
<td>71</td>
</tr>
<tr>
<td>Cellular RNA</td>
<td>908</td>
</tr>
<tr>
<td>Cerebrospinal Fluid</td>
<td>176</td>
</tr>
<tr>
<td></td>
<td>629</td>
</tr>
<tr>
<td>Cerebrospinal Fluid Proteins</td>
<td>893</td>
</tr>
<tr>
<td></td>
<td>1000A</td>
</tr>
<tr>
<td>Cervical Mucus</td>
<td>630</td>
</tr>
<tr>
<td>Chicken Serum</td>
<td>86</td>
</tr>
<tr>
<td>Chad Herbivora</td>
<td>449</td>
</tr>
<tr>
<td>Cholera</td>
<td>147</td>
</tr>
<tr>
<td>Cholestasis</td>
<td>395</td>
</tr>
<tr>
<td>Cholinesterases</td>
<td>1051</td>
</tr>
<tr>
<td>Chorionic Somatomammotropin</td>
<td>985</td>
</tr>
<tr>
<td>Chromogranine</td>
<td>697</td>
</tr>
<tr>
<td>Chromophoric Amino Acid</td>
<td>648</td>
</tr>
<tr>
<td>Circulating Blood</td>
<td>75</td>
</tr>
<tr>
<td>Circulating DNA</td>
<td>931</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Cirrhosis</td>
<td>107</td>
</tr>
<tr>
<td>Clostridium Botulinum Type A Toxin</td>
<td>453</td>
</tr>
<tr>
<td>Coat Proteins</td>
<td>1076</td>
</tr>
<tr>
<td>Colostrum Immunoglobulins</td>
<td>554</td>
</tr>
<tr>
<td>C-Reactive Protein</td>
<td>491</td>
</tr>
<tr>
<td>C-Reactive Protein in Tuberculous</td>
<td>722</td>
</tr>
<tr>
<td>C 3 Polymorphism</td>
<td>459</td>
</tr>
<tr>
<td>Cutaneous Manifestations of Allergy</td>
<td>303</td>
</tr>
<tr>
<td>Cysticercosis</td>
<td>252</td>
</tr>
<tr>
<td>Cytochrome 553</td>
<td>168</td>
</tr>
<tr>
<td>Cytochrome C</td>
<td>515</td>
</tr>
<tr>
<td>Cytoplasmic and Mitochondrial Aconitate Hydratases</td>
<td>869</td>
</tr>
<tr>
<td>Definition of a Method of Histobiochemical Analysis</td>
<td>266</td>
</tr>
<tr>
<td>Deoxyribonucleic Acid Base Composition</td>
<td>542</td>
</tr>
<tr>
<td>Dermal Acid Mucopolysaccharides</td>
<td>1041</td>
</tr>
<tr>
<td>Determination of the Size of Viruses using Gel Electrophoresis</td>
<td>258</td>
</tr>
<tr>
<td>D Group Streptococci Sera</td>
<td>59</td>
</tr>
<tr>
<td>Diagnosis of Bilharziasis</td>
<td>60</td>
</tr>
<tr>
<td>Diagnosis of Meningococcal Infections</td>
<td>171</td>
</tr>
<tr>
<td>Diagnosis of Parasitoses</td>
<td>57</td>
</tr>
<tr>
<td>Diagnosis of Tay-Sachs Disease</td>
<td>588</td>
</tr>
<tr>
<td>Diagnostic Significance of Electrophoresis</td>
<td>62</td>
</tr>
<tr>
<td>Dioxygenase, Querecentinase</td>
<td>270</td>
</tr>
<tr>
<td>Dissociated Cells F-Benzoquinone, Tannic Acid</td>
<td>475</td>
</tr>
<tr>
<td>DNA Polymerase</td>
<td>64</td>
</tr>
<tr>
<td>Double Pre-Beta Bands</td>
<td>287</td>
</tr>
<tr>
<td>Dysproteinemia in Liver Cirrhosis</td>
<td>124</td>
</tr>
<tr>
<td>Ehrlich Ascites</td>
<td>64</td>
</tr>
<tr>
<td>Electrophoresis of Drugs</td>
<td>604</td>
</tr>
<tr>
<td>Electrophoretic Analysis of Cell Populations in Presumptive Epidermis</td>
<td>336</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Electrophoretic Extraction</td>
<td>173</td>
</tr>
<tr>
<td>Electrophoretic Separation of Lymphocytes</td>
<td>779</td>
</tr>
<tr>
<td>11S Globulin Soybean Seeds</td>
<td>1042</td>
</tr>
<tr>
<td>Embryo Specific Alpha-Globulins</td>
<td>529</td>
</tr>
<tr>
<td>Encephalitis Virus</td>
<td>213</td>
</tr>
<tr>
<td>Encephalitogenic Protein</td>
<td>798</td>
</tr>
<tr>
<td>Cell Proteins of T-Strain Mycoplasmas</td>
<td>497</td>
</tr>
<tr>
<td>Encephalomyelitis</td>
<td>371</td>
</tr>
<tr>
<td>Enterotoxin Clostridium Perfringens Type A</td>
<td>759</td>
</tr>
<tr>
<td>Envelope Proteins</td>
<td>191</td>
</tr>
<tr>
<td>Enzyme</td>
<td>473</td>
</tr>
<tr>
<td>Enzyme Electrophoretograms</td>
<td>611</td>
</tr>
<tr>
<td>Enzyme Typing of Bloodstains</td>
<td>97</td>
</tr>
<tr>
<td>Epidemic Parotitis</td>
<td>108</td>
</tr>
<tr>
<td>Equine Growth Hormone</td>
<td>249</td>
</tr>
<tr>
<td>Erythrocyte</td>
<td>932</td>
</tr>
<tr>
<td>Erythrocyte Acid Phosphatase</td>
<td>582</td>
</tr>
<tr>
<td>Erythrocyte Carbonic Anhydrases</td>
<td>79</td>
</tr>
<tr>
<td>Erythrocyte Peptidases</td>
<td>198</td>
</tr>
<tr>
<td>Escherichia Coli Exotoxin</td>
<td>101</td>
</tr>
<tr>
<td>Escherichia Coli K12 Soluble Proteins</td>
<td>362</td>
</tr>
<tr>
<td>Ewing's Sarcoma</td>
<td>128</td>
</tr>
<tr>
<td>Exoantigen</td>
<td>78</td>
</tr>
<tr>
<td>Fatty Acids</td>
<td>223</td>
</tr>
<tr>
<td>Ferric Myoglobin</td>
<td>743</td>
</tr>
<tr>
<td>Ferritin</td>
<td>989</td>
</tr>
<tr>
<td></td>
<td>964</td>
</tr>
<tr>
<td></td>
<td>651</td>
</tr>
<tr>
<td></td>
<td>714</td>
</tr>
<tr>
<td></td>
<td>715</td>
</tr>
<tr>
<td></td>
<td>716</td>
</tr>
<tr>
<td></td>
<td>944</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Fibrinogen</td>
<td>781</td>
</tr>
<tr>
<td></td>
<td>993</td>
</tr>
<tr>
<td>Fibrinolytic</td>
<td>916</td>
</tr>
<tr>
<td>Fibrinopeptides</td>
<td>506</td>
</tr>
<tr>
<td>Five Main Histone Fractions</td>
<td>363</td>
</tr>
<tr>
<td>Foetal Hemoglobin</td>
<td>299</td>
</tr>
<tr>
<td>Follicle-Stimulating and Luteinizing Hormones</td>
<td>520</td>
</tr>
<tr>
<td>4S Antigens</td>
<td>680</td>
</tr>
<tr>
<td>Fowlpox and Vaccinia Virus Proteins</td>
<td>940</td>
</tr>
<tr>
<td>Fowl Spermatozoa</td>
<td>318</td>
</tr>
<tr>
<td>Fractional Methods</td>
<td>268</td>
</tr>
<tr>
<td>Fractionation of Proteins</td>
<td>237</td>
</tr>
<tr>
<td>Fructose-6-Phosphate Phosphoketolase</td>
<td>177</td>
</tr>
<tr>
<td>FSH in Swine</td>
<td>106</td>
</tr>
<tr>
<td>Galactose-1-Phosphate Uridyl Transferase</td>
<td>142</td>
</tr>
<tr>
<td>Galanthamine</td>
<td>624</td>
</tr>
<tr>
<td>Gamma-Globulins</td>
<td>151</td>
</tr>
<tr>
<td></td>
<td>307</td>
</tr>
<tr>
<td>gammopathies</td>
<td>408</td>
</tr>
<tr>
<td>Gangliosides</td>
<td>730</td>
</tr>
<tr>
<td>GC Component in Human Serum</td>
<td>55</td>
</tr>
<tr>
<td>GC Types</td>
<td>212</td>
</tr>
<tr>
<td>Gene-Frequency</td>
<td>459</td>
</tr>
<tr>
<td>Generic Identification of L-Forms</td>
<td>149</td>
</tr>
<tr>
<td>Genetically Different Proteins</td>
<td>530</td>
</tr>
<tr>
<td>Globin</td>
<td>994</td>
</tr>
<tr>
<td>Globulin</td>
<td>339</td>
</tr>
<tr>
<td></td>
<td>877</td>
</tr>
<tr>
<td>Glomerulonephritis</td>
<td>278</td>
</tr>
<tr>
<td>Glucose Metabolites</td>
<td>1071</td>
</tr>
<tr>
<td></td>
<td>1072</td>
</tr>
<tr>
<td>Glucose-6-Phosphate Dehydrogenase</td>
<td>749</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Glucose-6-Phosphate Dehydrogenase Isoenzymes</td>
<td>30</td>
</tr>
<tr>
<td>Glucuronidase</td>
<td>739</td>
</tr>
<tr>
<td>Glyceraldehyde-3-Phosphate Dehydrogenase, Fructoaldolase, Glyoxalase II and Sorbitol Dehydrogenase</td>
<td>1116</td>
</tr>
<tr>
<td>Glycoprotein Hormones</td>
<td>795</td>
</tr>
<tr>
<td>Glycophosphatides</td>
<td>132</td>
</tr>
<tr>
<td>Glycoproteins</td>
<td>185, 247, 248, 249, 335, 774</td>
</tr>
<tr>
<td>Glycosidases</td>
<td>633</td>
</tr>
<tr>
<td>GOT Isoenzyme</td>
<td>136</td>
</tr>
<tr>
<td>Grain Proteins</td>
<td>846</td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>105, 575, 732</td>
</tr>
<tr>
<td>Haemoglobin Electrophoresis</td>
<td>186</td>
</tr>
<tr>
<td>Haemoglobin Malmo</td>
<td>575</td>
</tr>
<tr>
<td>Halophilic Enzyme</td>
<td>528</td>
</tr>
<tr>
<td>Haptoglobins</td>
<td>1048</td>
</tr>
<tr>
<td>HCG</td>
<td>183</td>
</tr>
<tr>
<td>Heat-Labile Toxin of Bordetella Pertussis</td>
<td>102</td>
</tr>
<tr>
<td>Hela Cell Metaphase Chromosomes</td>
<td>664</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>32, 515</td>
</tr>
<tr>
<td>Hemoglobin A2</td>
<td>241, 513</td>
</tr>
<tr>
<td>Hemoglobin-Binding Protein</td>
<td>480</td>
</tr>
<tr>
<td>Hemoglobin Octamer</td>
<td>15</td>
</tr>
<tr>
<td>Hemoglobinopathies</td>
<td>757</td>
</tr>
<tr>
<td>Hemoglobin S</td>
<td>1027</td>
</tr>
<tr>
<td>Hemoglobin Solutions</td>
<td>369, 1018A</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Hemophilus Influenzae Type B</td>
<td>998</td>
</tr>
<tr>
<td>Heparin and Protamine Sulfate</td>
<td>9</td>
</tr>
<tr>
<td>Hepatic Phosphoenolpyruvate Carboxykinase</td>
<td>934</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>273</td>
</tr>
<tr>
<td>Hepatitis-Associated Antigen</td>
<td>174</td>
</tr>
<tr>
<td></td>
<td>182</td>
</tr>
<tr>
<td></td>
<td>297</td>
</tr>
<tr>
<td></td>
<td>359</td>
</tr>
<tr>
<td></td>
<td>277</td>
</tr>
<tr>
<td>Hepatitis-Homologous</td>
<td>358</td>
</tr>
<tr>
<td>Herpes Simplex Virus</td>
<td>744</td>
</tr>
<tr>
<td>Hexokinase in Cell Homogenates from Baker's Yeast</td>
<td>251</td>
</tr>
<tr>
<td>Histidine-Binding Protein J</td>
<td>620</td>
</tr>
<tr>
<td>Histidine Transport</td>
<td>620</td>
</tr>
<tr>
<td>Histones</td>
<td>1060</td>
</tr>
<tr>
<td>Histoplasma Capsulata Practical Diagnostic Results</td>
<td>261</td>
</tr>
<tr>
<td>Horseradish Peroxidase</td>
<td>800</td>
</tr>
<tr>
<td>H 3-RNA</td>
<td>1010</td>
</tr>
<tr>
<td>Human Alpha-2 Lipoprotein Bands</td>
<td>126</td>
</tr>
<tr>
<td>Human and Animal Hemoglobins</td>
<td>328</td>
</tr>
<tr>
<td>Human Anti-CEA</td>
<td>1131</td>
</tr>
<tr>
<td>Human Blood Platelets</td>
<td>552</td>
</tr>
<tr>
<td>Human Chorionic Gonadotropin</td>
<td>479</td>
</tr>
<tr>
<td>Human Chorionic Gonadotropin Luteinizing Hormone</td>
<td>782</td>
</tr>
<tr>
<td>Human Chorionic Somatomammotropin</td>
<td>985</td>
</tr>
<tr>
<td>Human Erythrocuprein</td>
<td>8</td>
</tr>
<tr>
<td>Human Erythrocytes</td>
<td>655</td>
</tr>
<tr>
<td>Human Follicle Stimulating Hormone</td>
<td>986</td>
</tr>
<tr>
<td>Human Haptoglobin 1-1 Molecule</td>
<td>116</td>
</tr>
<tr>
<td>Human Hemoglobins</td>
<td>152</td>
</tr>
<tr>
<td>Human Liver Alkaline Phosphatase</td>
<td>445</td>
</tr>
<tr>
<td>Human Lymphocytes</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>282</td>
</tr>
<tr>
<td></td>
<td>348</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Hydroxyindole-0-Methyltransferase</td>
<td>206</td>
</tr>
<tr>
<td>Hyperlipoproteinaemia</td>
<td>760</td>
</tr>
<tr>
<td>Hyperlipoproteinemias</td>
<td>232, 429</td>
</tr>
<tr>
<td>Hypoxanthine-Guanine</td>
<td>67</td>
</tr>
<tr>
<td>Phosphoribosyl Transferase</td>
<td>1025</td>
</tr>
<tr>
<td>IBR-Virus</td>
<td></td>
</tr>
<tr>
<td>Identification of Antibiotics</td>
<td>82</td>
</tr>
<tr>
<td>IGG I, II, and III</td>
<td>332</td>
</tr>
<tr>
<td>IGG-Paraproteinemias</td>
<td>38</td>
</tr>
<tr>
<td>IGM-Fraction</td>
<td>170</td>
</tr>
<tr>
<td>Immune Globulins with Antitoxic Activity</td>
<td>77</td>
</tr>
<tr>
<td>Immunolectrophoresis in Forensic Medicine</td>
<td>162</td>
</tr>
<tr>
<td>Immunolectrophoretic</td>
<td>411</td>
</tr>
<tr>
<td>Immunoglobulin Analysis</td>
<td>150</td>
</tr>
<tr>
<td>Immunoglobulins</td>
<td>936, 1044</td>
</tr>
<tr>
<td>Immunoglobulins G</td>
<td>332</td>
</tr>
<tr>
<td>Immunorheophoresis</td>
<td>119</td>
</tr>
<tr>
<td>Lactate Dehydrogenase</td>
<td>462, 485, 851</td>
</tr>
<tr>
<td>Lactogenic Factor</td>
<td>413</td>
</tr>
<tr>
<td>Lactoglobulin</td>
<td>1043</td>
</tr>
<tr>
<td>Lamb Fetuin</td>
<td>886</td>
</tr>
<tr>
<td>L-Arginase</td>
<td>729</td>
</tr>
<tr>
<td>L-Asparaginase</td>
<td>823</td>
</tr>
<tr>
<td>L-Cell Interferons</td>
<td>199</td>
</tr>
<tr>
<td>LDH-Isoenzymes</td>
<td>110, 949</td>
</tr>
<tr>
<td>Leishmaniaasis</td>
<td>519</td>
</tr>
<tr>
<td>Leucosis</td>
<td>72</td>
</tr>
<tr>
<td>Leukemia</td>
<td>264</td>
</tr>
<tr>
<td>Leukocyte Alkaline Phosphatase</td>
<td>340</td>
</tr>
<tr>
<td>L-Forms and Mycoplasma</td>
<td>309</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Lipid Electrophoresis</td>
<td>181</td>
</tr>
<tr>
<td>Lipoprotein Electrophoresis</td>
<td>47</td>
</tr>
<tr>
<td>Lipoproteins</td>
<td>222</td>
</tr>
<tr>
<td></td>
<td>422</td>
</tr>
<tr>
<td></td>
<td>451</td>
</tr>
<tr>
<td></td>
<td>887</td>
</tr>
<tr>
<td>Lipoproteins in Myocardial Infarct</td>
<td>146</td>
</tr>
<tr>
<td>Liver Catalase</td>
<td>465</td>
</tr>
<tr>
<td>Liver Lysosomes</td>
<td>895</td>
</tr>
<tr>
<td>Liver Polyribosomal RNA</td>
<td>792</td>
</tr>
<tr>
<td>Liver Tissue</td>
<td>234</td>
</tr>
<tr>
<td>Liver Tissue Constituents, Normal and Cystic Fibrosis</td>
<td>551</td>
</tr>
<tr>
<td>LP (A)-Protein</td>
<td>478</td>
</tr>
<tr>
<td>Lumbar Enlargement of the Spinal Cord</td>
<td>157A</td>
</tr>
<tr>
<td>Lymphocyte-Antigen Interaction</td>
<td>203</td>
</tr>
<tr>
<td>Lymphocytes and Macrophages</td>
<td>450</td>
</tr>
<tr>
<td>Lymphocytic Cytoplasmic RNA</td>
<td>246</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>231</td>
</tr>
<tr>
<td>Lysates of Mycoplasmas</td>
<td>385</td>
</tr>
<tr>
<td>Lysozyme</td>
<td>259</td>
</tr>
<tr>
<td>Macaca irus Salivary Alpha Amylase</td>
<td>974</td>
</tr>
<tr>
<td>Macromethod</td>
<td>110</td>
</tr>
<tr>
<td>Maize Endopeptidase</td>
<td>593</td>
</tr>
<tr>
<td>Malarial Antibodies</td>
<td>941</td>
</tr>
<tr>
<td>Malic Enzyme</td>
<td>654</td>
</tr>
<tr>
<td>Malignant Transformation</td>
<td>570</td>
</tr>
<tr>
<td>Mammalian Cells</td>
<td>570</td>
</tr>
<tr>
<td>Marasmus</td>
<td>172</td>
</tr>
<tr>
<td>Membrane and Wall Proteins</td>
<td>227</td>
</tr>
<tr>
<td>Membrane Components</td>
<td>1046</td>
</tr>
<tr>
<td>Membrane Electrophoresis</td>
<td>42</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Membrane Enzymes</td>
<td>12</td>
</tr>
<tr>
<td>Membranous Proteins</td>
<td>474</td>
</tr>
<tr>
<td>Meningococcal Arthritis</td>
<td>874</td>
</tr>
<tr>
<td>Mercaptalbumin, and Beta-Lactoglobulins A and B</td>
<td>403</td>
</tr>
<tr>
<td>Metallothionein</td>
<td>1125</td>
</tr>
<tr>
<td>Microbial Electrophoresis</td>
<td>534</td>
</tr>
<tr>
<td>Mycoplasma Mycoides</td>
<td>874</td>
</tr>
<tr>
<td>Myosin</td>
<td>279</td>
</tr>
<tr>
<td></td>
<td>853</td>
</tr>
<tr>
<td>N-Acetyl-D-Hexosaminamidase Isoenzymes</td>
<td>588</td>
</tr>
<tr>
<td>Neuraminidase</td>
<td>636</td>
</tr>
<tr>
<td></td>
<td>833</td>
</tr>
<tr>
<td>Neurospecific S-100 Protein Fractions</td>
<td>179</td>
</tr>
<tr>
<td>Nitrogen Compounds in Body Fluids</td>
<td>330</td>
</tr>
<tr>
<td>Nonhistone Chromosomal Proteins</td>
<td>783</td>
</tr>
<tr>
<td>Nonspecific Esterases in Blood Serum</td>
<td>65</td>
</tr>
<tr>
<td>Normal Human Lymphocyte</td>
<td>255</td>
</tr>
<tr>
<td>Normal Sera</td>
<td>46</td>
</tr>
<tr>
<td>Nucleic Acid</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>723</td>
</tr>
<tr>
<td>Nucleic Acid Bases</td>
<td>537</td>
</tr>
<tr>
<td>Nucleolar Proteins</td>
<td>892</td>
</tr>
<tr>
<td>Nucleosides Purines Pyrimidines</td>
<td>753</td>
</tr>
<tr>
<td>Numerous Samples Simultaneously</td>
<td>250</td>
</tr>
<tr>
<td>Microheterogeneity of Fetuin</td>
<td>184</td>
</tr>
<tr>
<td>Mitochondria</td>
<td>288</td>
</tr>
<tr>
<td>Monoclonal Gammopathies</td>
<td>262</td>
</tr>
<tr>
<td>Monospecific Antibody to Human Sulfatase</td>
<td>230</td>
</tr>
<tr>
<td>Motility</td>
<td>318</td>
</tr>
<tr>
<td>M-Proteins</td>
<td>274</td>
</tr>
<tr>
<td>Mucin Glycoproteins</td>
<td>774</td>
</tr>
<tr>
<td>Mucopolysaccharides</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>905</td>
</tr>
<tr>
<td>Multiple Molecular Forms</td>
<td>427</td>
</tr>
<tr>
<td>Substance</td>
<td>Reference Number</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Muscle Proteins</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>233</td>
</tr>
<tr>
<td></td>
<td>853</td>
</tr>
<tr>
<td>Muscular Parvalbumins</td>
<td>167</td>
</tr>
<tr>
<td>Mycobacteria</td>
<td>245</td>
</tr>
<tr>
<td></td>
<td>980</td>
</tr>
<tr>
<td>Mycobacterial Antigens</td>
<td>1022</td>
</tr>
<tr>
<td></td>
<td>1053</td>
</tr>
<tr>
<td></td>
<td>990</td>
</tr>
<tr>
<td>Mycobacterium Tuberculosis</td>
<td>788</td>
</tr>
<tr>
<td>Mycoplasma</td>
<td>884</td>
</tr>
<tr>
<td>Oligo Globulin</td>
<td>469</td>
</tr>
<tr>
<td>Oligonucleotide Isopliths</td>
<td>95</td>
</tr>
<tr>
<td>Oncogenic Ribonucleic Acid Viruses</td>
<td>814</td>
</tr>
<tr>
<td>Ophiobolus Graminis Sacc</td>
<td>457</td>
</tr>
<tr>
<td>Organelles</td>
<td>195</td>
</tr>
<tr>
<td>Ovomucoid Heterogeneity</td>
<td>256</td>
</tr>
<tr>
<td>Paracoccidioidomycosis</td>
<td>926</td>
</tr>
<tr>
<td>Parameters of Thyroid Function in Serum</td>
<td>33</td>
</tr>
<tr>
<td>Paraproteinaemia</td>
<td>226</td>
</tr>
<tr>
<td></td>
<td>659</td>
</tr>
<tr>
<td>Paraproteins</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>569</td>
</tr>
<tr>
<td></td>
<td>436</td>
</tr>
<tr>
<td>Paraproteinemias</td>
<td>123</td>
</tr>
<tr>
<td>Paraprotein Diseases</td>
<td>296</td>
</tr>
<tr>
<td>Paraproteins of Serum</td>
<td>272</td>
</tr>
<tr>
<td>Parotid Secretion</td>
<td>42</td>
</tr>
<tr>
<td>Partial Isolation of Human Renin</td>
<td>386</td>
</tr>
<tr>
<td>Pasteurella Pestic</td>
<td>148</td>
</tr>
<tr>
<td>Pathological Lymph Nodes</td>
<td>122</td>
</tr>
<tr>
<td>Penicillium Conidia</td>
<td>300</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Pepsinogen and Pepsin Fractions</td>
<td>432</td>
</tr>
<tr>
<td>Peptide Mixtures</td>
<td>164A</td>
</tr>
<tr>
<td>Periodontal Diseases</td>
<td>157</td>
</tr>
<tr>
<td>Peripheral Blood Lymphocytes</td>
<td>521</td>
</tr>
<tr>
<td>Peripheral Lymphocytes</td>
<td>122</td>
</tr>
<tr>
<td>Peromyscus 7S 1 Globulins</td>
<td>643</td>
</tr>
<tr>
<td>Peroxidases</td>
<td>683</td>
</tr>
<tr>
<td>Peroxidase Isozymes</td>
<td>684</td>
</tr>
<tr>
<td>Phenotyping of Hyperlipoproteinemia</td>
<td>94</td>
</tr>
<tr>
<td>Phialophora Verrucosa, Fonsecaea Pedrosi and Cladosporium Carrioni</td>
<td>440</td>
</tr>
<tr>
<td>Phlebotomus Group of Arboviruses</td>
<td>546</td>
</tr>
<tr>
<td>Phosphoacetylglucosamine Mutase</td>
<td>239</td>
</tr>
<tr>
<td>Phosphoglucomutase Types</td>
<td>472</td>
</tr>
<tr>
<td>Phosphoglycerate Kinase</td>
<td>751</td>
</tr>
<tr>
<td>Phospholipid</td>
<td>76</td>
</tr>
<tr>
<td>Phytohaemagglutinin</td>
<td>450</td>
</tr>
<tr>
<td>Pituitary Gonadotropins</td>
<td>382</td>
</tr>
<tr>
<td>Pituitary Prolactin</td>
<td>925</td>
</tr>
<tr>
<td>Plant Viral Protein</td>
<td>501</td>
</tr>
<tr>
<td>Plant Viral RNA Plasma Albumin</td>
<td>403</td>
</tr>
<tr>
<td>Plasma and Urinary Amino Acids</td>
<td>20</td>
</tr>
<tr>
<td>Plasmacytoma</td>
<td>305</td>
</tr>
<tr>
<td>Plasma Hyperbetalipoproteinemia</td>
<td>679</td>
</tr>
<tr>
<td>Plasma Kinen-Forming System</td>
<td>857</td>
</tr>
<tr>
<td>Plasma Lipoproteins</td>
<td>260</td>
</tr>
<tr>
<td></td>
<td>293</td>
</tr>
<tr>
<td></td>
<td>484</td>
</tr>
<tr>
<td>Plasma Prekallikrein</td>
<td>825</td>
</tr>
<tr>
<td>Plasma Proteins</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>995</td>
</tr>
<tr>
<td>Pneumococcal Bacteriaemia</td>
<td>367</td>
</tr>
<tr>
<td>Poliovirus Antigens</td>
<td>201</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Poliovirus Inhibitors</td>
<td>200</td>
</tr>
<tr>
<td>Polyacrylamide</td>
<td>683</td>
</tr>
<tr>
<td>Polyglycine</td>
<td>439</td>
</tr>
<tr>
<td>Polymorphous Enzymes Glutamate Pyruvate Transaminase and Phosphoglucomutase</td>
<td>603</td>
</tr>
<tr>
<td>Polypeptides of Influenza Virus</td>
<td>500</td>
</tr>
<tr>
<td>Polysaccharides</td>
<td>405</td>
</tr>
<tr>
<td>Post-Albumin Proteins</td>
<td>66</td>
</tr>
<tr>
<td>Prealbumin</td>
<td>735</td>
</tr>
<tr>
<td>Pre-Beta Lipoprotein</td>
<td>397</td>
</tr>
<tr>
<td>Pre-Beta Lipoprotein</td>
<td>709</td>
</tr>
<tr>
<td>Preformed Antibody</td>
<td>173</td>
</tr>
<tr>
<td>Pregnancy-Specific Protein</td>
<td>334</td>
</tr>
<tr>
<td>Primary Cancer of the Liver</td>
<td>138</td>
</tr>
<tr>
<td>Primary Hyperlipidemia</td>
<td>627</td>
</tr>
<tr>
<td>Progesterone Binding Protein (PBP)</td>
<td>997</td>
</tr>
<tr>
<td>Prolactin</td>
<td>893</td>
</tr>
<tr>
<td>Prolactin</td>
<td>985</td>
</tr>
<tr>
<td>Prolongation of Heterograft</td>
<td>173</td>
</tr>
<tr>
<td>Protein and LDH-Isoenzyme</td>
<td>641</td>
</tr>
<tr>
<td>Proteinase</td>
<td>1115</td>
</tr>
<tr>
<td>Protein Composition</td>
<td>470</td>
</tr>
<tr>
<td>Protein Detection and Isolation</td>
<td>109</td>
</tr>
<tr>
<td>Protein Fractions</td>
<td>414</td>
</tr>
<tr>
<td>Protein Fractions</td>
<td>516</td>
</tr>
<tr>
<td>Protein, Myogen and Myosin</td>
<td>220</td>
</tr>
<tr>
<td>Protein Polymers</td>
<td>148</td>
</tr>
<tr>
<td>Protein Polymorphism</td>
<td>112</td>
</tr>
<tr>
<td>Protein Quantitation</td>
<td>292</td>
</tr>
<tr>
<td>Protein Separations</td>
<td>286</td>
</tr>
<tr>
<td>Proteins</td>
<td>1073</td>
</tr>
<tr>
<td></td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>905</td>
</tr>
<tr>
<td></td>
<td>909</td>
</tr>
<tr>
<td></td>
<td>923</td>
</tr>
<tr>
<td></td>
<td>980</td>
</tr>
</tbody>
</table>

207
<table>
<thead>
<tr>
<th>Substance Analyzed</th>
<th>Reference Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proteins (continued)</td>
<td>463</td>
</tr>
<tr>
<td></td>
<td>511</td>
</tr>
<tr>
<td></td>
<td>512</td>
</tr>
<tr>
<td></td>
<td>647</td>
</tr>
<tr>
<td>Proteins and Carbohydrates</td>
<td>236</td>
</tr>
<tr>
<td>Proteins and Nuclear Acids</td>
<td>847</td>
</tr>
<tr>
<td>Proteins Extracted from Subcellular Structures of Brain</td>
<td>50</td>
</tr>
<tr>
<td>Proteins from Carrier Ampholytes</td>
<td>533</td>
</tr>
<tr>
<td>Influenza Virus</td>
<td>636</td>
</tr>
<tr>
<td>Insoluble Brain Proteins</td>
<td>1061</td>
</tr>
<tr>
<td>Insulin</td>
<td>493</td>
</tr>
<tr>
<td></td>
<td>988</td>
</tr>
<tr>
<td>Interacting Protein Systems</td>
<td>848</td>
</tr>
<tr>
<td>Interferons</td>
<td>536</td>
</tr>
<tr>
<td></td>
<td>790</td>
</tr>
<tr>
<td>Intestinal Mucosal Epithelial Cell</td>
<td>147</td>
</tr>
<tr>
<td>Investigation of Protein Drugs</td>
<td>591</td>
</tr>
<tr>
<td>IPV-Virus</td>
<td>1025</td>
</tr>
<tr>
<td>Isocitrate Dehydrogenase</td>
<td>935</td>
</tr>
<tr>
<td>Isoelectric Fractionation in Protein</td>
<td>240</td>
</tr>
<tr>
<td>Isoelectric Separation of Proteins</td>
<td>391</td>
</tr>
<tr>
<td>Isoenzyme Fructosephosphate Aldolase</td>
<td>96</td>
</tr>
<tr>
<td>Isoenzymes</td>
<td>1070</td>
</tr>
<tr>
<td>Isolation, Characterization of Two Phospholipase A's</td>
<td>228</td>
</tr>
<tr>
<td>Isolation of Blood Cells</td>
<td>721</td>
</tr>
<tr>
<td>Isomeric Chondroitin Sulfates</td>
<td>510</td>
</tr>
<tr>
<td>Jack Bean Proteins</td>
<td>706</td>
</tr>
<tr>
<td>Jack Bean Urease</td>
<td>807</td>
</tr>
<tr>
<td>Proteins in Serum</td>
<td>291</td>
</tr>
<tr>
<td>Proteins of Parainfluenza Virus SV5</td>
<td>100</td>
</tr>
<tr>
<td>Protein-Sodium Dodecyl Sulfate Complexes</td>
<td>576</td>
</tr>
<tr>
<td>Protein Synthesis by Lymphocytes</td>
<td>460</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Proteinuria</td>
<td>280</td>
</tr>
<tr>
<td>Proteolytic Enzymes</td>
<td>461</td>
</tr>
<tr>
<td>Pseudomonas Aeruginosa Haemolysin</td>
<td>337</td>
</tr>
<tr>
<td>Pseudoparaproteinemia</td>
<td>442</td>
</tr>
<tr>
<td>Psoriatic Epidermis</td>
<td>426</td>
</tr>
<tr>
<td>Pulmonary Aspergillosis</td>
<td>360</td>
</tr>
<tr>
<td>Pulmonary Edematous Fluid</td>
<td>921</td>
</tr>
<tr>
<td>Purified Allergens</td>
<td>354</td>
</tr>
<tr>
<td>Purines and Pyrimidines</td>
<td>753</td>
</tr>
<tr>
<td>Pyruvate Kinase</td>
<td>1033</td>
</tr>
<tr>
<td>Rabbit Antisera</td>
<td>76</td>
</tr>
<tr>
<td>Radicular Cysts and Granulomas</td>
<td>929</td>
</tr>
<tr>
<td>Rat Brain Proteins</td>
<td>889</td>
</tr>
<tr>
<td>Rat Liver Chromatin</td>
<td>726</td>
</tr>
<tr>
<td>Rat Liver Decarboxylases</td>
<td>117</td>
</tr>
<tr>
<td>Rat Liver Lysosomes</td>
<td>195</td>
</tr>
<tr>
<td>Rat Serum Lipoproteins</td>
<td>243</td>
</tr>
<tr>
<td>Recovery of Protein</td>
<td>590</td>
</tr>
<tr>
<td>Red Cell Enzyme Polymorphisms</td>
<td>563</td>
</tr>
<tr>
<td>Renin</td>
<td>553</td>
</tr>
<tr>
<td>Reverse Transcriptase</td>
<td>1020</td>
</tr>
<tr>
<td>Rheumatic Diseases</td>
<td>799</td>
</tr>
<tr>
<td>Rheumatism</td>
<td>155</td>
</tr>
<tr>
<td>Ribonuclease</td>
<td>1054</td>
</tr>
<tr>
<td>Ribonuclease Inhibitor</td>
<td>544</td>
</tr>
<tr>
<td>Ribonucleic Acid</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>1039</td>
</tr>
<tr>
<td></td>
<td>1128</td>
</tr>
<tr>
<td>Ribosomal Proteins</td>
<td>688</td>
</tr>
<tr>
<td></td>
<td>851</td>
</tr>
<tr>
<td>Ribulose-1, 5-Diphosphate</td>
<td>1119</td>
</tr>
<tr>
<td>RNA</td>
<td>329</td>
</tr>
<tr>
<td></td>
<td>978</td>
</tr>
<tr>
<td></td>
<td>1009</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>RNA-Rich Fraction</td>
<td>840</td>
</tr>
<tr>
<td>Sarcoplasmic and Mitochondrial Isoenzymes</td>
<td>49</td>
</tr>
<tr>
<td>Schistosoma Mansoni Alpha-Naphthyl Acetate Esterases</td>
<td>131</td>
</tr>
<tr>
<td>Scand J Clin Lab Invest 29, Suppl, 1972</td>
<td>584</td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td>61</td>
</tr>
<tr>
<td>Securin</td>
<td>624</td>
</tr>
<tr>
<td>Seminoprotein (-SM)</td>
<td>612</td>
</tr>
<tr>
<td>Separated Proteins</td>
<td>45</td>
</tr>
<tr>
<td>Separation of Proteins in Concentrated Cerebrospinal Fluid</td>
<td>285</td>
</tr>
<tr>
<td>Seric Proteins</td>
<td>238</td>
</tr>
<tr>
<td>Serum Aklaline Phosphatases</td>
<td>163</td>
</tr>
<tr>
<td>Serum Beta and Pre-Beta-Lipoproteins</td>
<td>271</td>
</tr>
<tr>
<td>Serum Beta Lipoproteins</td>
<td>70</td>
</tr>
<tr>
<td>Serum Glycoproteins</td>
<td>21</td>
</tr>
<tr>
<td>Serum Hepatitis</td>
<td>276</td>
</tr>
<tr>
<td>Serum Lipoprotein Analysis</td>
<td>437</td>
</tr>
<tr>
<td>Serum Lipoproteins</td>
<td>507</td>
</tr>
<tr>
<td>Serum Lipoproteins Patterns</td>
<td>523</td>
</tr>
<tr>
<td>Serum Lipoprotein Patterns</td>
<td>134</td>
</tr>
<tr>
<td>Separation of Lymphocytes</td>
<td>737</td>
</tr>
<tr>
<td>Serum</td>
<td>708</td>
</tr>
<tr>
<td>Serum Immunoglobulins</td>
<td>992</td>
</tr>
<tr>
<td>Serum LDH Isoenzyme</td>
<td>752</td>
</tr>
<tr>
<td>Serum Protein Fractions</td>
<td>24</td>
</tr>
<tr>
<td>Serum Protein Electrophoresis</td>
<td>374</td>
</tr>
<tr>
<td>Serum Protein</td>
<td>1045</td>
</tr>
<tr>
<td></td>
<td>1050</td>
</tr>
<tr>
<td></td>
<td>820</td>
</tr>
<tr>
<td></td>
<td>801</td>
</tr>
<tr>
<td></td>
<td>733</td>
</tr>
<tr>
<td></td>
<td>668</td>
</tr>
<tr>
<td></td>
<td>667</td>
</tr>
<tr>
<td></td>
<td>656</td>
</tr>
<tr>
<td></td>
<td>632</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Serum Protein (continued)</td>
<td></td>
</tr>
<tr>
<td>Serum Lipoproteins</td>
<td></td>
</tr>
<tr>
<td>Serum Proteins Electrophoresis in Liver Diseases</td>
<td>396</td>
</tr>
<tr>
<td>Serum Proteins in Leprosy</td>
<td>141</td>
</tr>
<tr>
<td>Serum Lipoproteins</td>
<td>267</td>
</tr>
<tr>
<td>Sheep Serum</td>
<td>103</td>
</tr>
<tr>
<td>16 Different Blood Proteins</td>
<td>489</td>
</tr>
<tr>
<td>Single Components in Protein Mixtures</td>
<td>202</td>
</tr>
<tr>
<td>Sickleanemia</td>
<td>186</td>
</tr>
<tr>
<td>Sickledex</td>
<td>804</td>
</tr>
<tr>
<td>Skin Test Antigen SST</td>
<td>39</td>
</tr>
<tr>
<td>Soluble Extracts of Dirofilaria Immitis</td>
<td>210</td>
</tr>
<tr>
<td>Soluble Liver Proteins</td>
<td>820</td>
</tr>
<tr>
<td>Soluble Proteins</td>
<td>999</td>
</tr>
<tr>
<td>Some Proteins</td>
<td>269</td>
</tr>
<tr>
<td>Sonicated Human Serum Proteins</td>
<td>41</td>
</tr>
<tr>
<td>Sow Milk</td>
<td>991</td>
</tr>
<tr>
<td>Specific Enzyme of Human Sperm</td>
<td>338</td>
</tr>
<tr>
<td>Sperm in Sperm Stains</td>
<td>153</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Spinal Fluid</td>
<td>892</td>
</tr>
<tr>
<td></td>
<td>1001</td>
</tr>
<tr>
<td>Staphylococcal Enterotoxin</td>
<td>900</td>
</tr>
<tr>
<td>Staphylococcal Enterotoxin C2</td>
<td>758</td>
</tr>
<tr>
<td>Staphylococcus Aureus Extracts</td>
<td>1098</td>
</tr>
<tr>
<td>S-Sulfo Derivatives of Fibrinogen</td>
<td>29</td>
</tr>
<tr>
<td>Staphylococcal Toxins</td>
<td>40</td>
</tr>
<tr>
<td>Streptococcus Mutans</td>
<td>53</td>
</tr>
<tr>
<td>Streptolysin</td>
<td>836</td>
</tr>
<tr>
<td>Study of Liver Disease</td>
<td>357</td>
</tr>
<tr>
<td>Sulfated Nucleotides</td>
<td>420</td>
</tr>
<tr>
<td>Sulphur-Rich Proteins from Wool</td>
<td>578</td>
</tr>
<tr>
<td>Surface Antibodies</td>
<td>71</td>
</tr>
<tr>
<td>Synovia</td>
<td>188</td>
</tr>
<tr>
<td>Synovial Proteins</td>
<td>301</td>
</tr>
<tr>
<td>T and B Lymphocytes</td>
<td>677</td>
</tr>
<tr>
<td>Tears</td>
<td>482</td>
</tr>
<tr>
<td>T4 Genes 44 and 62</td>
<td>1094</td>
</tr>
<tr>
<td>Thalassaemia Syndromes</td>
<td>105</td>
</tr>
<tr>
<td>Thalassemia</td>
<td>25</td>
</tr>
<tr>
<td>32 P-Labeled RNA</td>
<td>1066</td>
</tr>
<tr>
<td>3,5,3-L-Tri-Iodothyronine-Binding, Proteins</td>
<td>483</td>
</tr>
<tr>
<td>Thrombocytic Properties</td>
<td>217</td>
</tr>
<tr>
<td>Thymus Specific Antigen</td>
<td>1085</td>
</tr>
<tr>
<td>Thyroid Diseases</td>
<td>809</td>
</tr>
<tr>
<td>Thyroid Follicles</td>
<td>1073</td>
</tr>
<tr>
<td>Thyroid Hormone</td>
<td>447</td>
</tr>
<tr>
<td></td>
<td>735</td>
</tr>
<tr>
<td>Thyroxine-Binding</td>
<td>883</td>
</tr>
<tr>
<td>Thyroxine-Binding Human Serum Proteins</td>
<td>133</td>
</tr>
<tr>
<td>Thyroxine-Binding Protein</td>
<td>458</td>
</tr>
<tr>
<td>Timothy Pollen Antigen</td>
<td>298</td>
</tr>
<tr>
<td>Tissue and Serum Creatine Kinase Isoenzymes</td>
<td>598</td>
</tr>
<tr>
<td>Substance Analyzed</td>
<td>Reference Number</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>208 TL and 207 TL</td>
<td>644</td>
</tr>
<tr>
<td>Tobacco Rattle Virus Protein</td>
<td>939</td>
</tr>
<tr>
<td>Toxicosis</td>
<td>339</td>
</tr>
<tr>
<td>Toxoplasma Condii</td>
<td>518</td>
</tr>
<tr>
<td>Treponemal Antigen</td>
<td>640</td>
</tr>
<tr>
<td>Triiodothyronine-TBPA</td>
<td>735</td>
</tr>
<tr>
<td>Triprotamines</td>
<td>164</td>
</tr>
<tr>
<td>Trypanosoma Brucei</td>
<td>223</td>
</tr>
<tr>
<td>Trypanosoma Cruzi</td>
<td>51</td>
</tr>
<tr>
<td>Tryptophanyl Transfer RNA Synthetase from Lymphocytes</td>
<td>264</td>
</tr>
<tr>
<td>2M, IGA and IGM</td>
<td>962</td>
</tr>
<tr>
<td>Urinary Amino Acids</td>
<td>22</td>
</tr>
<tr>
<td>Urinary Delta-Aminolevulinic Acid</td>
<td>488</td>
</tr>
<tr>
<td>Urinary Proteins</td>
<td>448</td>
</tr>
<tr>
<td>Uranyl-Resistant Paraproteins</td>
<td>409</td>
</tr>
<tr>
<td>Vaccinia Antigen and Antibody</td>
<td>885</td>
</tr>
<tr>
<td>Viral Hepatitis</td>
<td>21</td>
</tr>
<tr>
<td>Virus</td>
<td>13</td>
</tr>
<tr>
<td>Viruses of Vaccinia, Buffaloopox, Variola and Alastrim</td>
<td>548</td>
</tr>
<tr>
<td>Virus Particles Type C and A</td>
<td>725</td>
</tr>
<tr>
<td>Vitamin B 12-Binding Substances</td>
<td>175</td>
</tr>
<tr>
<td>Water-Soluble Proteins</td>
<td>157A</td>
</tr>
<tr>
<td>Weber-Edsall Extract and Actomyosin</td>
<td>347</td>
</tr>
<tr>
<td>S-(4-Pyridylethyl)-L-Cysteine Myosin</td>
<td>736</td>
</tr>
<tr>
<td>SH Antigen</td>
<td>357</td>
</tr>
</tbody>
</table>
Letters of inquiry were sent to the following members of the scientific community:

Dr. Eugene A. Arnold
Department of Pathology
Johns Hopkins University School of Medicine

Dr. J. Austin
Divisions of Neurology and Clinical Immunology
University of Colorado Medical Center

Dr. Barbara-Anne Battelle
Biology Department
Syracuse University

Dr. P. J. Bechtel
Department of Food Science and Human Nutrition
Michigan State University

Dr. H. N. Bhargava
Department of Pharmacology
University of California School of Medicine

Dr. C. E. Bodwell
Protein Nutrition Laboratory
Human Nutrition Research Division
Agricultural Research Service
United States Department of Agriculture

Dr. James Bonner
Division of Biology
California Institute of Technology

Dr. Rosaria P. Brivio
Biology Department
Syracuse University

Dr. N. Catsimpooulas
Laboratory of Protein Chemistry
Central Soya Research Center

Dr. S. L. Chan
Department of Pharmacology
University of California School of Medicine
Ms. Rosalyn Cleevey  
The Home Office Central Research Establishment  
Aldermaston  
Berkshire, England

Ms. Mary Davies  
The Home Office Central Research Establishment  
Aldermaston  
Berkshire, England

Dr. Paul J. Davis  
Department of Medicine  
Baltimore City Hospital

Dr. S. Dasqupta  
Department of Biology  
Saint Louis University

Dr. Friedrich Deinhardt  
Department of Microbiology  
Rush-Presbyterian-St. Lukes Medical Center

Dr. R. De Wachter  
Laboratory of Physiological Chemistry  
State University of Ghent  
Ghent, Belgium

Dr. John T. Dulaney  
Department of Molecular Biology  
Vanderbilt University

Dr. Sarah C. R. Elgin  
Division of Biology  
California Institute of Technology

Dr. E. J. Field  
Demyelinating Diseases Unit  
Newcastle General Hospital  
Newcastle-upon-Tyne, England

Dr. James R. Florini  
Biology Department  
Syracuse University

Dr. E. Gardner  
Department of Pharmacology  
University of California School of Medicine

Dr. Robert A. Good  
Department of Pathology  
University of Minnesota
Dr. Robert I. Gregerman  
Gerontology Research Center  
National Institute of Child Health and Human Development  
National Institute of Health

Dr. A. L. Griffith  
Department of Anatomy  
University of Illinois at the Medical Center

Dr. E. A. Grula  
Department of Microbiology  
Oklahoma State University

Dr. Barry S. Handwerger  
Department of Medicine  
Johns Hopkins University School of Medicine

Dr. K. Hannig  
Max-Planck-Institut für Eiweiss und Lederforschung  
8 München  
West Germany

Dr. John Hoekstra  
Department of Microbiology  
Rush-Presbyterian-St. Lukes Medical Center

Dr. John A. Illingworth  
Department of Biochemistry  
University of Cambridge  
Cambridge CB2 1QW, United Kingdom

Dr. B. M. Jones  
University College of Wales  
Department of Zoology  
Aberystwth, Wales

Dr. Paul Kaesberg  
Biophysics Laboratory and Department of Biochemistry  
University of Wisconsin

Dr. R. B. Kemp  
Department of Zoology  
University College of Wales  
Aberystwth, Wales

Dr. S. S. Kind  
Forensic Science Laboratory  
Government Buildings  
Broadway West  
Gosforth  
Newcastle-upon-Tyne, England
Dr. P. Kohler
Divisions of Neurology and Clinical Immunology
University of Colorado Medical Center

Dr. Arthur La Velle
Department of Anatomy
University of Illinois at the Medical Center

Dr. Gary W. Litman
Department of Pathology
University of Minnesota

Dr. K. P. Maier
Medizinische Universität
78 Freiburg
West Germany

Dr. David C. Merz
Department of Pathology
University of Minnesota

Ms. Patricia A. Morris
Home Office Central Research Establishment
Aldermaston
Berkshire, England

Dr. Neuwelt
Divisions of Neurology and Clinical Immunology
University of Colorado Medical Center

Dr. Gunner F. Nordberg
Department of Hygiene
Karolinska Institute
Stockholm, Sweden

Dr. Monica Nordberg
Department of Hygiene
Karolinska Institute
Stockholm, Sweden

Dr. Constance Molino Park
Albert Einstein College of Medicine

Dr. A. M. Pearson
Department of Food Science and Human Nutrition
Michigan State University

Dr. Magnus Piscator
Department of Hygiene
Karolinska Institute
Stockholm, Sweden
Mr. A. Plough  
Plough Incorporated

Dr. C. F. Savory  
Department of Microbiology  
Oklahoma State University

Dr. D. Y. Schirachi  
Department of Pharmacology  
University of California School of Medicine

Dr. R. Stahn  
Max-Planck-Institut für Elweiss und Lederforschung  
8 München  
West Germany

Dr. Ellen Glowacki Strauss  
Division of Biology  
California Institute of Technology

Dr. D. Stumpee  
Divisions of Neurology and Clinical Immunology  
University of Colorado Medical Center

Dr. Oscar Touster  
Department of Molecular Biology  
Vanderbilt University

Dr. A. J. Trevor  
Department of Pharmacology  
University of California School of Medicine

Dr. Olof Vesterberg  
National Institute of Occupational Health  
S-104 01  
Stockholm 60, Sweden

Dr. O. Vesterberg  
Chemistry Department  
National Institute  
S-104 01  
Stockholm 60, Sweden

Dr. P. H. Whitehead  
Metropolitan Police Forensic Science Laboratory  
Holborn  
London WV, England

Dr. Takasaki Yamada  
National Cancer Research Institute  
Division of Pathology  
Tokyo, Japan

Dr. Keith E. Young  
Department of Pathology  
Johns Hopkins University School of Medicine
Wilrijk, June 6, 1974.

Dear Mrs. Gempel,

I must first of all apologize for replying so late to your letter, dated April 19th, in which you ask me if I see any advantage in application of electrophoretic techniques in zero g surroundings. This is due to the fact that my address has changed and I only received your letter with much delay.

I am sorry to disappoint you, but although it may be true that electrophoresis carried out in space may not have some of the drawbacks of the technique as carried out on the surface of the earth, I would consider that it is not worthwhile investing in research on this subject at the moment.

I am convinced that spaceflight is a very far-reaching achievement, but that it can be better used for other and more important purposes than the improvement of separation techniques.

Sincerely yours,

Dr. R. De Wachter
Department of cell biology.
Ms. Patricia Gempel:
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Ms. Patricia Gempel:

In reply to your letter of April 19, 1974, I do not feel at this time that the electrophoretic separation of viral proteins, or whole virus particles in space at zero gravity would be a feasible project. Although such an experiment would be interesting in a theoretical sense, the increased resolution would probably not justify the expense involved. Moreover, most biological procedures (unlike certain experiments in physics or astronomy) need to be available on a routine basis in order to be valuable to the research worker.

I have also sent a copy of this letter to Dr. Paul Kaesberg, who is still working with bacterial viruses, and with Qβ in particular. I am no longer working with this type of virus. The Group A arbovirus which I am currently using is too large for this approach.

I thank you for your interest; however, for the reasons listed above I am not interested in collaboration at this time.

Sincerely yours,

Ellen G. Strauss

cc: Dr. Paul Kaesberg
April 26, 1974

Dr. Patricia A. Gempel
Chemical Systems Section
Arthur D. Little, Inc.
Acorn Park
Cambridge, Mass. 02140

Dear Dr. Gempel:

Your letter has caused me a crisis of conscience. As a long time aviation-space fan (I built model airplanes as a boy, and now I am a Flight Instructor with about 850 hours flight time), the prospect of doing anything even remotely associated with the Skylab system is very appealing, and I am greatly tempted to bend my scientific judgement on this matter.

However, try as I might - and I certainly do - I cannot find persuasive advantages for analyses of myosin by isoelectric focusing under zero gravity. In part, this may be because I have never thought of this aspect of things. Even such an elementary and obvious point as the effects on convection did not occur to me until you raised it in your letter, so there may be other factors I have not considered. Frankly, I hope so - I would be delighted if you could persuade me that some of our samples should be analyzed at zero gravity.

There is one other snag, however. Now that Drs. Brivio and Battelle have left my lab, we are not doing IEF of myosin any longer. If you are interested only in having a myosin sample to try, there are many people (some of them in Boston) better qualified than I to furnish it. And Barbara Battelle is currently on a post-doc in Sidman's lab at Harvard Medical, so she is conveniently nearby if you want to talk with her.

On the other hand, if you feel that my lab may be able to make some contributions to the zero gravity approach, I would be delighted to have you attempt to persuade me. My phone is AC315, 423-2510.

Sincerely yours,

James R. Florini, Ph.D.
Professor of Biochemistry
Ms. Patricia A. Gempe
Chemical Systems Section
Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts 02140

Dear Ms. Gempe:

I am writing in reply to your letter of April 19, in which you suggested that an electrophoresis system we described several years ago might have improved resolution of proteins in a "zero g" atmosphere. As you probably know, the technique we reported (J Clin Endocrinol Metab 30:237, 1970; ibid., 33:699, 1971; J Clin Invest 51:515, 1972) depends upon the buffers developed by N.E. Good (Biochemistry 5:467, 1966); such buffers were constructed for use in the "physiologic pH range," and indeed have proved to be quite electrophoresis buffers. Andreas Chrambach at NIH has written about the use of these buffers in several long papers. As you no doubt noted from the reading of the JCI paper, the electrophoresis system we used was a continuous one.

While the pH 7.4 method was satisfactory for resolving the three thyroid hormone-binding proteins in human serum, it is poor at protein resolution in general. The method can be improved by introducing some discontinuities (of pore size, molarity), but we have insisted on homogeneous pH. Protein-protein interactions may be more prominent at pH 7.4, impeding resolution. We are now investigating the electrophoretic characteristics of soluble intracellular proteins which bind thyroid hormones and are interested in improved resolution of such proteins at physiologic pH. (Such soluble proteins focus as three peaks on isoelectric fractionation, but we have been able to demonstrate only one moiety in various polyacrylamide gel electrophoresis systems; it is unclear whether the isoelectric focusing studies represent a phenomenon of buffer ampholyte interaction with one protein or whether there are in fact more than one binding protein in cytoplasm.)

In any event, I would be interested in talking at the issue of improving resolution in the physiologic pH electrophoresis systems. My telephone number here is 342-5400, extension 1331 (area code 301).
April 26, 1974

I appreciate your interest.

Sincerely,

Paul J. Davis, M.D., Head
Endocrinology Division
Associate Professor of Medicine
Johns Hopkins University

PJD:chm
April 30, 1974

Dr. Patricia A. Gempel  
Chemical Systems Section  
Arthur D. Little, Inc.  
Acorn Park  
Cambridge, Massachusetts 02140

Dear Dr. Gempel:

As you have no doubt learned, Dr. Sarah Elgin is now Professor Sarah Elgin, Dept. of Biochemistry and Molecular Biology, Harvard University. Write her there.

Yours,

[Signature]

James Bonner  
Professor of Biology

JB:ds
9th May, 1974.

Mrs. Patricia A. Gempel,
Chemical Systems Section,
Arthur D. Little, Inc.,
Acorn Park,
CAMBRIDGE,
Massachusetts,
U.S.A.

Dear Mrs. Gempel,

Thank you for your letter of April 22nd.

Certainly a "zero g" environment would be helpful in overcoming some of the difficulties in making measurement. Drift (thermal or mechanical) as well as sedimentation would be eliminated, and this would much alleviate the tax on the patience of the observer.

But, frankly, I do not see how one is going to look down a microscope and "time" cells in a "zero g" environment. Or have you ingeniously catered for this? I would be most interested to hear.

Yours sincerely,

E. J. Field
Professor of Experimental Neuropathology
Dear Dr Gempel

Thank you for your recent letter concerning electrophoresis in a "zero g" atmosphere.

While we have considerable experience in electrophoresis of red cell enzymes and serum proteins using most of the conventional media (and more recently iso-electric focusing), the prospect of carrying out experiments in a zero-gravity atmosphere is one that, I confess, had not crossed my mind.

I regret I am not familiar with work carried on under such conditions but would be interested to hear of any results. It may be that if "zero g" conditions are easily obtained in the laboratory and greater resolution is obtained of enzyme variants, for example, then it may be interesting for us to investigate.

I would be interested to hear further of your work and discuss the possible forensic implications, if any, with you or your people.

I understand you have an office in London - perhaps I could have a chat with someone there?

I look forward to hearing from you.

Yours sincerely

[Signature]

Dr P H Whitehead
May 10, 1974

Ms. Patricia A. Gempel
Chemical Systems Section
Arthur D. Little, Inc.
Acorn Park
Cambridge, MA 02140

Dear Ms. Gempel:

Thank you for your letter of April 19 to Dr. P. J. Bechtel, who is now working with Dr. E. G. Krebs in the Medical School at the University of California in Davis. In his absence, I am replying to your letter.

I would be very pleased to visit with you further on the possibility of increasing the solubility of proteins by working at zero gravity. The procedure certainly sounds interesting, and I would be happy to talk to you more concerning it. If you should be able to visit us on campus, Dr. J. R. Brunner of this Department who is well versed in electrophoretic techniques would also like to visit with you.

Will look forward to hearing from you.

Sincerely yours,

A. M. Pearson, Professor
Food Science & Human Nutrition

AMP/1k
Ms. Patricia A. Gempel
Chemical Systems Section
Arthur D. Little, Inc.
Cambridge, Mass. 02140

Dear Ms. Gempel:

I have read your letter with considerable interest although with some puzzlement. It would be nice to know in somewhat more detail the nature of your deliberations. At this moment it is difficult for me to visualize any particular advantage to be derived from performing electrophoresis in a "zero g" environment. This is a technique with which I have had considerable experience and your implications have piqued my curiosity.

The article which you refer to on "Purification and..." relies mainly on liquid chromatography, a technique which depends largely on gravitational forces for its success. In two subsequent publications the use of electrophoretic techniques are described in somewhat more detail.

Needless to say I would be interested in the opportunity to explore this subject further with you.

Cordially,

Eugene Gardner, Ph.D.
17th June 1974

Miss P.A. Gempel,
Chemical Systems Section,
Arthur D. Little Inc.,
Acorn Park,
Cambridge, Massachusetts 02140.

Dear Miss Gempel,

I am sorry for the delay in replying to your letter of 22nd April 1974 but I was absent from Aberystwyth for a considerable period of time. I can see the value of "Zero-G" for electrophoretic separation especially of heavy particles for instance cells in suspension. In fact, I discussed with Bier his attempted experiment in one of the Appolo Spacecrafts.

You are perhaps right in thinking that aggregation might be decreased in "Zero-G" conditions but I have no idea how "Zero-G" might affect the Physiochemical parameters (Vander Waal's forces, electrostatics etc.) responsible for adhesion, the mechanism of cell aggregation. Of course, cells have to make contact to adhere and "Zero-G" would affect this. It might also affect the movement of cells within an aggregate or their movement on artificial surfaces, dependent upon production of cellular processes (altered by "Zero-G"?) In fact the general question of the effect of such conditions on the ultrastructure of cells in culture might be worth considering.

I would certainly be interested in considering this possibility with you.

Yours sincerely,

Dr. R.B. Kemp.
Dear Dr. Gempel,

This is a reply to your letter of April 19, 1974. Without question you raise an interesting approach to electrophoretic procedures. I have been working with isoelectric focusing for more than 10 years. In technique convection as well as sedimentation has to be counteracted by one means or another. Earlier density gradients or gels such as polyacrylamide have been used for this purpose, however, these solutions are not ideal and there exist really a need for a means were these agents can be avoided. Other reason for this is that they might interfere with the determination of isoelectric points of protein. As you might know isoelectric focusing is very unique, because it makes possible the determination of isoelectric points (pl) of proteins in the simple way. Isoelectric points determined in this way are very valuable physico-chemical constant of proteins of an importance that can be compared to molecular weight data. The reason why these pl values have not yet come into more general use is that they can be influenced by various factors, e.g. ionic strength when determined by older technique such as electrophoresis, but they seem to be determinable with the high degree of reproducibility by isoelectro focusing.

For the reasons mentioned above I would be very interested in discussing with you the possibility to performe focusing in zero gravity atmosphere as you propose in your letter. For your information I can give you references to other articles on isoelectric focusing that are of more general value than the one you mentioned in your letter. I send you some copies of reprints and would be glad to supply you with more references also from other authors in forthcoming letters.

Yours sincerely,

Olof Vesterberg

Dr. Patricia A. Gempel
Arthur D. Little, Inc.
Acorn Park
Cambridge Mass. 02140
USA
APPENDIX 6

SURVEY OF DIAGNOSTIC LABORATORY TESTS
1. Rubella Antibody Detection

**Methods:**
- Hemmagglutination inhibition (HI)
- Complement fixation (CF)
- Indirect fluorescent antibody
- Neutralization tests (takes 7-11 days)

**Clinical Use:**
- Determination of immunity status - HI suggested
- Diagnosis of Detrology of viral exanthemata - CF or HI test on acute serum with a follow-up test on convalescent serum.

**Comments:**
Purified antigens are needed for all these assays. The present detection systems are sufficient to diagnose the disease 4-7 days following the appearance of a rash. The infective stage has passed by this time. Refer to Figure 1 below:

**FIGURE 1**

The appearance and disappearance of Rubella virus, HI and CF antibody. (Abstracted from a teaching slide from the Center for Disease Control.)
2. Australia, SH or Hepatitis - Associated Antigen

Methods (arranged in order of decreasing sensitivity):
- Radioimmunoassay
- Hemagglutination inhibition
- Complement fixation (CF)
- Counterlectrophoresis (CEP)
- Agar gel diffusion (AGD)

Clinical Use:
Used for detection of 30-40% of serum hepatitis cases.

Comments:
1. Lag between initial infection and the appearance of circulating antibody similar to rubella.
2. Antigen and antibody excess zones which will inhibit a positive reaction in all assays except the radioimmunoassay.
3. Lack of purified antigens.

3. Coccidiomycosis Antibody

Method:
- Delayed hypersensitivity test
- Slide Latex agglutination test
- Immunodiffusion test

Clinical use:
Diagnosis of coccidiomycosis

Comments:
The delayed hypersensitivity test is specific, first to become positive and will remain positive life long.
Circulating antibody is only detectable 12 to 16 weeks following infection.
All serological tests for coccidiomycosis cross react with histoplasmosis and blastomycosis.
4. Treponema Pallidum Antibody Detection

**Method:**
Fluorescent Treponemal Antibody Absorption Test (FTA-ABS).

**Clinical Use:**
Diagnosis of syphilis > 90% effective.

**Comments:**
The FTA test uses specific *T. pallidum* antigen. There are some false positives related to cross reactivity between these antigens and similar, but undefined, determinates.

5. Toxoplasma Antibody Detection

**Method:**
Indirect hemagglutination (IHA)
Fluorescent antibody (FA)

**Clinical Use:**
Diagnose toxoplasmosis

**Comments:**
20-80% of the population has a positive titer (16-256). Rising titers are indications of active infection. New borns usually have a titer equivalent to the mother because of passive transfer.

6. Mycoplasma CF Test

**Comment:**
Antigens are cell extracts and cells are difficult to culture.

7. Endamoeba Histolytica

**Method:**
Direct exam of feces
Indirect Hemagglutination Test (IHA)
Complement Fixation Test (CF)

**Comment:**
Serum assays are good, but this microorganism is so distinctive and so easily identified that serum assays are probably unnecessary.
A. ANDROGENIC HORMONES

1. 17-Ketosteroids (17-KS)


Clinical Use:

a) Increased excretion occurs in:
- Interstitial cell tumor of testes, very high
- Simple hirsutism, occasionally
- Cushing's syndrome due to adrenal hyperplasia
- Adrenal hyperplasia-female pseudohermaphroditism or adrenogenital syndrome.
- Adrenal cancer, virilism (not Cushing's syndrome), very high
- Adrenal tumor, virilism, not malignant (?)
- Arrhenoblastoma and lutein cell tumor of the ovary, when androgenic
- Treatment with ACTH; Severe stress; Treatment with testosterone

b) Decreased excretion occurs in:
- Thyrotoxicosis, Female hypogonadism, diabetes mellitus, hypertension, debilitating disease of mild to moderate severity - slight decrease.
- Eunuchoidism or castration of male, gout, moderate to severe debility from any chronic illness - moderate decrease.
- Addison's disease, panhypopituitarism, myxedema, nephrosis - severe decrease.

Comments: If total 17-KS are normal there is little practical value to run either the DHA (dehydroepiandrosterone) determination by the Allen "blue" test or β:α
The determination. The 17-KS can be grouped into the alpha fraction (principally androsterone and etiocholanolone) and the beta fraction (principally dehydroepiandrosterone.) The interpretation of a total 17-KS level in terms of androgenic activity must be made with consideration of the age, sex and clinical state of the patient. In most adult cases of adrenal carcinoma, the ratio of \( \beta : \alpha \) ranges from 0.28-4.0. Most cases in children show a significant elevation of the ratio. A ratio of 0.4 or above indicates strongly carcinoma. Caution: there is a significant daily variation in 17-KS excretion.

Normal values:

Children:

Excretion rates are the same for both sexes through childhood. The following table indicates the range of values found:

- Up to 1 yr. = less than 1 mg. per day
- 1 - 4 yrs. = less than 2 mgs. per day
- 5 - 8 yrs. = less than 3 mgs. per day
- 13-16 yrs. = 2.5-10 mgs. per day

Adult males:

9-22 mgs. per day. After about age 60 the rate of excretion progressively declines.

Adult females:

6-15 mgs. per day. After about age 60 the rate of excretion progressively declines.

The normal ratio of beta to alpha 17-ketosteroids is usually less than 0.2, i.e., there are at least five times as much alpha ketosteroids as beta ketosteroids by weight.

237
determination. The 17-KS can be grouped into the alpha fraction (principally androsterone and etiocholanolone) and the beta fraction (principally dehydroepiandrosterone.) The interpretation of a total 17-KS level in terms of androgenic activity must be made with consideration of the age, sex and clinical state of the patient. In most adult cases of adrenal carcinoma, the ratio of $\beta:\alpha$ ranges from 0.28-4.0. Most cases in children show a significant elevation of the ratio. A ratio of 0.4 or above indicates strongly carcinoma. Caution: there is a significant daily variation in 17-KS excretion.

Normal values:

Children:
Excretion rates are the same for both sexes through childhood. The following table indicates the range of values found:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Value Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1 yr.</td>
<td>less than 1 mg. per day</td>
</tr>
<tr>
<td>1 - 4 yrs.</td>
<td>less than 2 mgs. per day</td>
</tr>
<tr>
<td>5 - 8 yrs.</td>
<td>less than 3 mgs. per day</td>
</tr>
<tr>
<td>13-16 yrs.</td>
<td>2.5-10 mgs. per day</td>
</tr>
</tbody>
</table>

Adult males:
9-22 mgs. per day. After about age 60 the rate of excretion progressively declines.

Adult females:
6-15 mgs. per day. After about age 60 the rate of excretion progressively declines.

The normal ratio of beta to alpha 17-ketosteroids is usually less than 0.2, i.e., there are at least five times as much alpha ketosteroids as beta ketosteroids by weight.
2. Testosterone

Methods:
Measurements of testosterone in plasma or serum determined by the following techniques: bioassay, enzymatic-fluorescence, double isotope derivatization, partition chromatography, gas chromatography, competitive protein-binding radio assay, radioimmunoassay.

Clinical Use:
a) Adult Males:
Orchidectomy - concentration of testosterone drops down to 1/4 - 1/20 of the original level of the patient after being orchidectomized for neoplastic disease of the prostate or breast.

Estrogen Therapy - Patients with prostatic carcinoma treated with estrogen show a marked decrease in circulating testosterone.

Klinefelter's Syndrome - level of testosterone below lower limit of adult male.

Testosterone Therapy - patients with adult Leydig-cell failure or eunuchoidism treated with long-acting testosterone esters show normal level for 2-3 weeks.

Primary and secondary hypopituitarism and hypogonadism - testosterone level below 200 nanograms/100 ml.

Hepatic cirrhosis - testosterone level between 110-550 nanograms/100 ml, but majority of cases are below 220 nanograms/100 ml.

b) Adult Females:
Polycystic Ovary (Stein-Leventhal Syndrome) - testosterone level between 100-300 nanograms/100 ml. ACTH or glucocorticoid treatment drops level of testosterone.

Idiopathic Hirsutism - testosterone level between 30-200 nanograms/100 ml. Synthetic glucocorticoid or estrogen-progesterone combinations reduce level to normal.
Virilizing Tumors - Arrhenoblastomas, dermoids, malignant teratomas and other tumors may secrete testosterone.

c) Prepubertal children:
Delayed puberty in young adults (15-17 years old): testosterone level below 100 nanograms/100 ml.
Treatment possible (7-12 days) with human chorionic gonadotropism which increased the concentration 6-to 20-fold.

Pituitary infantilism in young adults: testosterone level below 100 nanograms/100 ml. Treatment showed no elevation of testosterone.

Comments:
Normal testosterone levels in men range from 300-1200 nanograms/100 ml. Studies show very little correlation of age and plasma testosterone.

Normal testosterone levels in women extend from 30-95 nanograms/100 ml. Levels are greater during the ovulatory and luteal phases of the menstrual cycle. During pregnancy concentration increases significantly (no relation to the sex of the fetus).

Concentration of plasma testosterone in children (4-10 years old) ranges for girls between 1-34 ng/100 ml and for boys 20-80 ng/100 ml.

Plasma testosterone level reflects a result of alterations of both the production rate and the metabolic clearance rate.
B. ESTROGENIC HORMONES

1. Total Estrogens Determination

Methods:
Fluorometric analysis - because of small quantities of the estrogens and interfering substances in the urine a purification utilizing gel filtration is necessary to obtain a sensitive and accurate measurement on a spectrophotofluorimeter.

Clinical Use:

a) Decreased Estrogen Values:
Agenesis of the ovaries
Primary ovarian malfunction
Dysfunction of the pituitary or other metabolic disturbances
Hypogonadism (absence of ovulation and corpus luteum function)
Inadequate sexual maturation or regression of previously occurring sexual maturation
Non-occurrence or cessation of menstruation
Absolute sterility
Hypofunction of the pituitary and adrenal glands may lead to low estrogen levels.

b) Increased Estrogen Values:
Ovarian tumors (cystic tumors comprise about two-thirds of all ovarian tumors, solid tumors are mostly granulosa- and theca-cell types).
A tumor or hypoplasia of the adrenal cortex may increase level. Cases in male may give rise to feminization with gynecomastia, impotence, azoospermia and testicular atrophy.

Comments:
The hyperestrogenism of a granulosa-cell or theca-cell tumor of the ovary during childhood should be differentiated from hyperovarianism.
Total urinary estrogen for non-pregnant or post-menopausal women and adult men are:
Non-pregnant women-preovulatory phase: 5-25 micrograms/24 hr.
Non-pregnant woman-ovulatory phase: 24-100 micrograms/24 hr.
Non-pregnant woman-luteal phase: 12-80 micrograms/24 hr.
Post-menopausal women: Less than 10 micrograms/24 hr.
Adult males: 4-25 micrograms/24 hr.
During pregnancy the estrogen level can rise as high as 45 milligrams per 24 hours.
2. Placental Estriol

Methods:
Chemical determination - high estriol content of pregnancy urine eliminates some of the complex purification procedures required in the Total Estrogen method.

Clinical Use:
Maternal urinary estriol excretion is a reliable index for assessment of the fetal placental complex. Decrease of estriol excretion during second and third trimesters may indicate placental dysfunction or other abnormalities of pregnancy.

Comments:
Serial determinations are essential since daily estriol values vary considerably. If estriol excretion curve declines constantly of more than 70% of previous values, placental insufficiency is probable.
Estriol excretion for the 2nd and 3rd trimester of pregnancy.

<table>
<thead>
<tr>
<th>WEEKS OF PREGNANCY</th>
<th>RANGE OF ESTRIOL VALUES</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Up to 3 mg/24 hrs.</td>
</tr>
<tr>
<td>20</td>
<td>1-9</td>
</tr>
<tr>
<td>24</td>
<td>4-12</td>
</tr>
<tr>
<td>28</td>
<td>5-17</td>
</tr>
<tr>
<td>32</td>
<td>6-22</td>
</tr>
<tr>
<td>36</td>
<td>8-32</td>
</tr>
<tr>
<td>40</td>
<td>9-37</td>
</tr>
</tbody>
</table>

C. PROGESTATIONAL HORMONES

1. Plasma Progesterone

Methods: Specific binding of the hormone by corticosteroid-binding globulin (test is based on selective extraction of progesterone from plasma).

Clinical Use:

a) Females:
Infertility problems due to either Anovulatory Menstrual Cycles, Polycystic Ovary (Stein-Leventhal) Syndrome or Hypoplastic Secretory Endometrium (inadequate luteal phase) show low level of progesterone.

Adrenal Hyperplasia - uncomplicated virilizing adrenal hyperplasia (21-hydroxylase deficiency) elevates progesterone level.

Pregnancy - first trimester progesterone levels are equal or slightly higher as in the luteal phase of the normal menstrual cycle, thereafter, gradual increase occurs.

Threatened or Recurrent Abortion, Intrauterine Death - levels of plasma progesterone falls but in some cases of intrauterine death level remains normal for a period of time.

Poor Fetal Growth - no increase in progesterone values over a period of time may indicate poor fetal growth.
b) Males:
Virilizing Adrenal Hyperplasia - elevated progesterone levels, after ACTH stimulation level increases even more and may remain elevated if conversion to cortisol is impaired.

Comments:
Plasma progesterone levels are a more sensitive measure of corpus luteum formation than urinary pregnanediol.

Normal range of plasma progesterone in females:
Follicular phase - under 150 ng/100 ml.
Luteal phase - at least 300 ng/100 ml.
Peak levels at about mid-luteal phase may exceed 2,000 ng/100 ml.
Pregnancy values during first trimester range from 1500 - 5000 ng/100 ml and continues to rise and reaches values between 8,000 - 20,000 ng/ml in the third trimester.
Normal range of plasma progesterone in males: under 100 ng/100 ml.

2. Pregnanediol

Methods:

Clinical Use:
Threatened Abortion - lowered levels of pregnanediol, and if followed by high levels an abortion is very likely to happen.

Corpus Luteum Cysts - elevated levels of pregnanediol.

Remains of placental tissue in the uterus following parturition - elevated levels of pregnanediol.

Some cases of Adrenal-Cortical Tumors - show high levels.

Comments:
Degeneration of the corpus luteum and the onset of menstruation is evidenced by a precipitous decrease in urinary pregnanediol.
Proliferative phase: 0.5 - 1.5 mg/24 hrs.
Luteal phase: 2 - 7 mg/24 hrs.
Post menopausal levels range from 0.2 - 1.0 mg/24 hrs.
In pregnant females the pregnanediol excretion rises steadily and at about the 32nd week it levels off. After 24 hrs. following parturition there is a drop to non-pregnancy levels by the 5th to the 10th day post-partum.

<table>
<thead>
<tr>
<th>WEEKS OF PREGNANCY</th>
<th>RANGE OF PREGNANDIOL IN URINE (MG./24 HRS.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>5--21</td>
</tr>
<tr>
<td>20</td>
<td>6--26</td>
</tr>
<tr>
<td>24</td>
<td>12--32</td>
</tr>
<tr>
<td>28</td>
<td>18--51</td>
</tr>
<tr>
<td>32</td>
<td>22--66</td>
</tr>
<tr>
<td>35</td>
<td>13--77</td>
</tr>
<tr>
<td>40</td>
<td>23--63</td>
</tr>
</tbody>
</table>

D. ADRENAL CORTICAL HORMONES - 1: GLUCOCORTICOIDS

1. Urinary 17-OH-Corticosteroids

Methods:
   a) 17-OH-corticosteroids may be determined as:
      17-Ketogenic steroids (17-KGS)
      Porter-Silber chromogens (e.g., Glenn-Nelson method)

   b) 17-Ketogenic steroids include the 17-OH-corticosteroids with the dihydroxyacetone side-chain AND the pregnanetriol types of compounds.

   c) Porter-Silber chromogens (Glenn-Nelson method) determine only the dihydroxyacetone side-chain compounds, e.g., THE, THF, and THS.

Clinical Use:
These hormones regulate gluconeogenesis (production of sugar to protein) which results in:
    negative nitrogen balance
    loss of potassium from tissues
    decreased peripheral utilization of carbohydrate
    insulin resistance (producing a diabetes)
    increased uric acid excretion
    increased circulating neutrophiles, eosinopenia, lymphopenia.
Overproduction or therapeutic administration of these hormones may result in the physical changes of Cushing's syndrome (thin¬ning of skin, muscular wasting and weakness, osteoporosis and ecchymoses.)
Comments:
The 17-KGS procedure is recommended for screening purposes from the standpoint of cost and the fact that it includes more 17-OH-corticosteroids.

NORMAL RANGE:

Urine:

<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 1 year</td>
<td>Less than 1</td>
<td>Less than 1</td>
</tr>
<tr>
<td>Up to 10 years</td>
<td>Less than 5</td>
<td>Less than 5</td>
</tr>
<tr>
<td>Adults</td>
<td>5-23</td>
<td>3-15</td>
</tr>
<tr>
<td>Over 70 years</td>
<td>3-12</td>
<td>3-12</td>
</tr>
</tbody>
</table>

BY GLEWN-NELSON METHOD:

<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>3-10</td>
<td>2-6</td>
</tr>
</tbody>
</table>

2. Plasma Cortisol (Plasma 17-OH-Corticosteroids)

Method:
Fluorescence technic - caution: plasma must be separated from the cells immediately after obtaining the heparinized blood; the fluorescence characteristics of the plasma cortisol are stable for at least 7 days at R.T. (30° C).

Clinical Use:

<table>
<thead>
<tr>
<th>17-OH CORTICOSTEROID LEVEL</th>
<th>CLINICAL CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low or low normal</td>
<td>Addison's disease</td>
</tr>
<tr>
<td></td>
<td>Anterior pituitary hypofunction</td>
</tr>
<tr>
<td>Slight increase</td>
<td>Pregnancy (first trimester)</td>
</tr>
<tr>
<td></td>
<td>Severe hypertension</td>
</tr>
<tr>
<td></td>
<td>Virilism</td>
</tr>
<tr>
<td>Moderate increase</td>
<td>Stress; infectious disease; surgery, burns, etc.</td>
</tr>
<tr>
<td></td>
<td>Pregnancy (third trimester)</td>
</tr>
<tr>
<td>Marked increase</td>
<td>Cushing's syndrome, most cases</td>
</tr>
<tr>
<td></td>
<td>Extreme stress; pancreatitis, colitis</td>
</tr>
</tbody>
</table>

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR
Comment:
Normal range of adults: 5-20 ng/100 ml plasma

The plasma cortisol determination may show spuriously elevated values if contraceptive drugs taken (increase in cortisol-binding protein from the use of estrogenic compounds).

3. Urinary "Free" (Unconjugated) Cortisol:

Methods:
Fluorimetric analysis - caution: spironolactone, an aldosterone antagonist, is a known interfering substance; estrogens and oral contraceptives may lead to elevated levels of urinary "free" cortisol.

Clinical Use:
Cushing's syndrome

Comment:
The procedure is primarily for uncovering elevations, low values do not necessarily indicate adrenal hypofunction. If high levels are found in patients taking contraceptive pills or other estrogenic material medication should be withheld and another estimation performed at least one month later.

Normal ranges:
Female: 78-365 μg/24 hours
Male: 108-409 μg/24 hours
D. ADRENAL CORTICAL HORMONES - II: MINERALOCORTICOIDS

1. Aldosterone

Methods:
Radioimmunoassay procedure for urinary aldosterone - method involves purification by extraction, followed by acid hydrolysis and re-extraction, and chromatography to remove naturally occurring steroids in potentially interfering levels. Radioimmunoassay involves the specific binding of aldosterone in competition with \(^{125}\)I-aldosterone to an anti-aldosterone antiserum produced in sheep.

Clinical Use:
Secondary Aldosteronism - (aldosterone output is elevated due to a greater activity in the renin-angiotensin system or external stimuli).

a. Salt depletion, affecting the ECF.
b. Potassium loading, possibly through a transmembrane phenomenon.
c. ACTH in large doses, causing a transient rise.
d. Cardiac failure, affecting sodium retention and expansion of ECF. "Right-sided" heart failure apparently results in higher aldosterone levels.
e. Cirrhosis of liver with ascites formation.
f. Nephrotic syndrome.
g. Idiopathic cyclic edema, abnormal capillary permeability.
h. Pregnancy, increasing to term, followed by rapid decrease after delivery.
i. Bartter's syndrome, renal juxtaglomerular hyperplasia.
j. Post surgical syndrome.
k. Hypovolemia, hemorrhage, transudation and posture.

Primary Aldosteronism - high aldosterone output caused by an adrenocortical tumor in the face of low plasma renin activity. Hypertension, intermittent muscular pains, cramps, weakness, tetany, "paralysis" and polyuria.
Comment:
Normal range of urinary aldosterone at "Bio-Science" : 2-26, µg per 24 hours (Note: assure adequate sodium intake).

The determination of plasma aldosterone is valuable in diagnosis and localization in primary aldosteronism. Plasma aldosterone is unstable at R.T., it is stable if kept frozen. Normal ranges are not precisely defined yet.

D. ADRENAL CORTICAL HORMONES - III: PREGNANETRIOL

Method:
Cox procedure - measuring the acetaldehyde formed upon oxidation of pregnanetriol with periodic acid.

Clinical Use:
Adrenogenital syndrome (e.g., congenital adrenal hyperplasia) - excessive excretion of pregnanetriol.

Comment:
Cases of adrenogenital syndrome often show a moderately elevated 17-Ketosteroid and a considerably increased 17-Ketogenic steroids (major fraction constituted by pregnanetriol) level. Pregnanetriol is measured when urine is analyzed for 17-OH-corticosteroids by the 17-Ketogenic steroid procedure. By performing the 17-Ketogenic steroid test along with a pregnanetriol assay, information becomes available both as to the adrenal activity and metabolism.

Normal range found in urine of normal adults is 0.2 - 4 mgs/day. Children usually show less than 0.5 mgs/day. Pregnanetriol excretion is increased as a result of ACTH stimulation.
PROTEIN HORMONES

1. Chorionic Gonadotropin (CG)

Methods:

a) Bioassay - an aliquot of the urine is purified and concentrated by means of kaolin adsorption and elution at proper pH's. The extract is injected at various concentrations into immature (21 day old) female rats. After 24 hrs. the rats are sacrificed and the ovaries are examined for hyperemia as a positive response.

b) Immunoassay - assays for CG have been performed by:
   - complement-fixation
   - precipitin tests
   - hemagglutination-inhibition tests with either sensitized erythrocytes or latex particles

Clinical Use:

Testicular tumor (usually mixed epithelioma type) - large amounts of CG (1,000 - 50,000 units) found in urine.

Chorionepithelioma - 100,000 units or more excreted CG.

Hydatidiform mole - 100,000 units or more excreted CG.

Pregnancy test - hormone appears soon after the first missed menstruation in human pregnancy, reaches a peak between the 50th and 80th day of gestation then decreases until partially disappearing a few days after parturition.

Comment:

CG levels determined by immunological tests are somewhat higher than levels determined by bioassay. Normal range in male and non-pregnant female: none detected. In pregnant female CG levels in the immunoassay method reach 1,000 iu/liter between 35 to 40 days after the last normal menstrual period. Then level increases rapidly, peaking at about the 50th to 80th day. Decrease occurs and the level of 2,000 - 10,000 are maintained until parturition after which the hormone disappears within a few days.
2. Pituitary Gonadotropins

Methods:
Several methods have been employed for the bioassay of the pituitary gonadotropins, using as end points uterine enlargements, ovarian growth, vaginal patency, vaginal cornification, and seminal vesicle weights. The increase in uterine weight of the immature rat or mouse is the most widely used criterion and measures the combined FSH (Follicle Stimulating Hormone) and ICSH (Interstitial Cell Stimulating Hormone) effect on total gonadotropins.

Clinical Use:
Increased levels in:
- Menopause, including premature menopause, Ovarian agenesis
- Klinefelter's syndrome
- Adult seminiferous tubule failure
- Male climacteric

Decreased levels in:
- Children before puberty
- Hypogonadotropic eunuchoidism
- Anorexia nervosa
- Estrogen administration
- Neoplasms of the adrenal, ovary or testis which secrete estrogens or androgens

Comment:

NORMAL RANGE:

Urine by Bioassay:
- Adult: Approximately 6-50 mouse uterine units (MUU) per 24 hours.
- Children (before puberty): Less than 6 MUU per 24 hours.
- Menopause: Greater than 50 MUU per 24 hours.

Serum or Plasma by IIA:
- Male: 4-25 milli-IU/ml.
- Female: Premenopausal: 4-30 milli-IU/ml.
- Postmenopausal: 40-250 milli-IU/ml.
- Midcycle peak: 2x the baseline.

(Diurnal variations from high in the morning to low in the evening have been observed)
3. Luteinizing Hormone (LH)

Methods:
Radioimmunoassay procedure
- the method utilizes serum as the specimen but is also capable of measuring LH in unconcentrated urine. Caution: Interfering substance is variably present in urine, so that a concentration and purification procedure would be necessary.

Clinical Use:
Amenorrhea due to ovarian failure - basal plasma LH levels are elevated (but not in case of amenorrhea secondary to pituitary failure) Caution: The mid-cycle peak is completely obliterated in normal women using oral contraceptives.

An ovulatory fertility problem - presence or absence of a mid-cycle peak can be established by analysis of a series of daily serum specimens. Caution: Difficulties in deciding when and how many specimens to collect. Schalch et al shows the mid-cycle to occur around the 11th - 17th day.

Postmenopausal state - testosterone and estrogen administered depresses LH levels.

Comment:
Normal Ranges:
Range in m I.U./ml. Serum

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>Less than 11</td>
<td></td>
</tr>
<tr>
<td>Women, pre-menopausal</td>
<td>Less than 25</td>
<td></td>
</tr>
<tr>
<td>Women, mid-cycle peak</td>
<td>Greater than 3 times baseline value</td>
<td></td>
</tr>
<tr>
<td>Women, post-menopausal</td>
<td>Greater than 25</td>
<td></td>
</tr>
</tbody>
</table>

Arthur D Little Inc
4. Insulin

Methods:

Radioimmunoassay determination - radioisotope-labeled insulin is added to sample with unlabeled insulin and the total insulin is reacted with a potent anti-insulin serum to form an insulin/anti-insulin complex. This complex is isolated by precipitation and the radioactivity determined of the unknown specimen.

Clinical Use:

Diagnosis of insulinoma - increase in plasma insulin level is greater after tolbutamide administration than after glucose.

Maturity-onset diabetes - the serum insulin level is higher than normal after ingestion of 100 grams of glucose between the 1 and 2 hour period.

Reactive hypoglycemia - elevated plasma insulin level along with normal blood glucose levels.

Acromegaly - elevated serum insulin level.

Comment:

"NORMAL RANGE":

<table>
<thead>
<tr>
<th>UNIT (ng)</th>
<th>INSULIN (µU/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4 - 24</td>
</tr>
<tr>
<td>32</td>
<td>25 - 291</td>
</tr>
<tr>
<td>64</td>
<td>18 - 276</td>
</tr>
<tr>
<td>128</td>
<td>16 - 156</td>
</tr>
<tr>
<td>256</td>
<td>4 - 38</td>
</tr>
</tbody>
</table>

*Based on a statistical analysis of the data of Morgan and Holland (5)


5. Growth Hormone

Method:

Radioimmunoassay technique - the hormone from the unknown specimen is made to compete with a fixed amount of isotope-labeled hormone (added to the unknown serum) for binding sites on

Arthur D Little Inc
antibodies contained in a highly specific antiserum. Quantitated in a radiation counter, counts are fewer or greater in number depending upon the amount of growth hormone in unknown specimen.

Clinical Use:

**Less than normal growth of humans or Dwarfism** - hyposecretion of growth hormone by the pituitary gland.

**Pituitary Gigantism** - hypersecretion of growth hormone.

**Acromegaly** - hypersecretion of growth hormone, characterized by gradual deformation of the bones particularly of the face, hands and feet.

Comment:

10% of dwarfism in childhood may be caused by hyposecretion of growth hormone. It is important to distinguish these as early as possible since therapy with human growth hormone is effective. Since low levels are not significant, response to a challenge test is required.

A single, individual result is not significant in hypopituitarism, more information is usually obtained by the challenge tests.

Normal Range: The literature to date gives the following information for the fasting state.

<table>
<thead>
<tr>
<th>BASELINE</th>
<th>Adult Male</th>
<th>0-8 nanograms/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>0-3 nanograms/ml</td>
<td></td>
</tr>
</tbody>
</table>

*Lowest levels are found during basal conditions. Values in the upper end of this range may occur with special conditions such as Turner's syndrome, marasmus, anorexia nervosa, obesity, or when high free fatty acid levels are present in the fasting state.*

**FOLLOWING CHALLENGE:** (The GH response to challenge is usually less in children than in adults)

**Insulin:** 30 min. to 2 hrs. after satisfactory insulin challenge.
- Baseline value increases 3-5 fold.

**Arginine:** 30 min. to 1 hr. after appropriate arginine monohydrochloride infusion.
- Male: Baseline value increases up to 3 fold.
- Female: Baseline value increases up to 10 fold.

In general a rise in growth hormone concentration of 5 to 10 nanograms is considered a positive response to insulin and arginine stimulation tests.

**Glucose:** 30 min. to 2 hrs. after 100g. glucose ingestion.
- Male or female: Baseline value decreases to 0.3 nanograms/ml.

*Available from Cutter Laboratories as R. Genes*
6. Renin

Methods:

**Bioassay** - measures the amount of angiotensin II formed in the patient's plasma "in vitro" during a fixed time-temperature period.

**Radioimmunoassay** - the angiotensin I formed is incubated with specific antibody and $^{125}$I-angiotensin I. The amount of $^{125}$I-angiotensin I bound to antibody decreases with an increase in plasma angiotensin I as a result of competition for antibody sites.

**Clinical Use**: (See Page 20)
Clinical Use:

Recent reports on the renin-angiotensin system in various conditions in man*

<table>
<thead>
<tr>
<th>Condition</th>
<th>PRA</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physiologic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diuretic deprivation</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Thiazides, short-term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrochlorothiazide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold pressor stimulation</td>
<td>+</td>
<td>Added sodium restriction</td>
</tr>
<tr>
<td>Upright posture</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pharmacologic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catecholamines</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Reserpine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clonidine HCL (Catapres)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydralazine</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Furosemide</td>
<td>+</td>
<td>Also increases renin substrate</td>
</tr>
<tr>
<td>Oral contraceptives</td>
<td>0,</td>
<td></td>
</tr>
<tr>
<td>Sodium nitroprusside</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><strong>Pregnancy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>+</td>
<td>Less than normal increase seen</td>
</tr>
<tr>
<td>Toxemic</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Renal disease</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glomerulonephritis</td>
<td>0</td>
<td>Canine experimental</td>
</tr>
<tr>
<td>Cystic nephrosis</td>
<td>0</td>
<td>Human nephritis</td>
</tr>
<tr>
<td>Nephrosis</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Rhabdomyolysis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transplant</td>
<td>0</td>
<td>Normal response to stimuli</td>
</tr>
<tr>
<td>Obstructive uropathy with hyper tension</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td><strong>Hypertension</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renovascular</td>
<td>±</td>
<td>Renal vein difference significant</td>
</tr>
<tr>
<td>Essential</td>
<td>-</td>
<td>Response to stimuli sluggish in 20% of cases, especially in Negro</td>
</tr>
<tr>
<td>Malignant</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Coarctation</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Hypotension</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postural</td>
<td></td>
<td>No rise with posture</td>
</tr>
<tr>
<td><strong>Endocrine diseases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary aldosteronism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ectopic aldosteronism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bartter's syndrome</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>&quot;Pseudohypoaldosteronism&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phaeochromocytoma</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Congenital adrenal hyperplasia</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Miscellaneous diseases</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cirrhosis with edema</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

PRA: + = increased; - = decreased; 0 = no change.
DOC = desoxycorticosterone.
*Drawn in most part from the medical literature, 1968 to 1969.

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR
**NORMAL RANGES:**

**Bioassay:**

<table>
<thead>
<tr>
<th>PURPOSE AND CLINICAL CONDITION</th>
<th>VALUES IN ng/ml/hr. of plasma</th>
<th>RECENT (before arising, 7-8 A.M.)</th>
<th>UPRIGHT (following 4 hrs. of quiet, upright activity, about 12 noon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To screen hypertensive patients:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>30-330*</td>
<td>73-480*</td>
<td></td>
</tr>
<tr>
<td>&quot;Idiopathic&quot; hypertension</td>
<td>Values usually fall within above range</td>
<td>Values usually fall within above range</td>
<td></td>
</tr>
<tr>
<td>Renovascular hypertension</td>
<td>335-670†</td>
<td>Usually elevated</td>
<td></td>
</tr>
<tr>
<td>Frank primary aldosteronism</td>
<td>Very low (approaches zero)</td>
<td>Very low (approaches zero)</td>
<td></td>
</tr>
<tr>
<td>Malignant hypertension</td>
<td>420-4600†</td>
<td>Markedly elevated</td>
<td></td>
</tr>
<tr>
<td>To support tentative diagnosis of primary aldosteronism:</td>
<td>(on low salt diet, no more than 10 meq./day for three days prior to sampling)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal Response</td>
<td>25%-100%-100%- increase over baseline values obtained under screening conditions above</td>
<td>20%-225%- increase over baseline values obtained under screening conditions above</td>
<td></td>
</tr>
<tr>
<td>Frank primary aldosteronism</td>
<td>Very low (approaches zero)</td>
<td>Very low (approaches zero)</td>
<td></td>
</tr>
<tr>
<td>Possible primary aldosteronism</td>
<td>Low values</td>
<td>Low values</td>
<td></td>
</tr>
</tbody>
</table>

*95% confidence limits calculated by the transformation from the data of Gunnells, et al.*

†Range (not statistical limits) found by Benetti et al. in patients evaluated for renovascular hypertension, 11 patients; for malignant hypertension, 13 patients.

**Radioimmunoassay:**

Renin activity is expressed as ng of angiotensin I released per ml of plasma per hour. For the upright position and normal salt intake in adults, the following range was established at Bio-Science Laboratories:

Normal Range: 0.4 - 4.5 ng/ml/hr.
7. Gastrin

**Methods:**

Radioimmunoassay - the serum gastrin is made to compete with a fixed amount of isotope-labeled synthetic gastrin for binding sites in an antiserum containing antibodies of high specificity.

**Clinical Use:**

- **Zollinger-Ellison (Z-E) syndrome** - elevated serum gastrin levels, cases have been reported between 600-300,000 pg per ml.

- **Peptic ulcer disease** - serum gastrin level of 400 pg/ml is not exceeded normally.

- **Pernicious anemia** - elevated serum gastrin levels, disorder is characterized by the inability to secrete gastric HCl which can be quickly repaired by the intragastric infusion of 0.1N HCl.

**Comment:**

Normal range: Non-detectable to 300 pg gastrin/ml serum. Levels are considered elevated when clearly over 500 pg/ml. There is no statistically significant difference between the mean fasting serum gastrin level in patients with ulcer disease other than the Z-E syndrome and a population of patients without recognized gastrointestinal diseases matched for age and sex.
ADRENAL MEDULLARY HORMONES

1. Catecholamines

Methods:
Determination of both the activation on fluorescence spectra with a recording spectrofluorometer of the urinary catecholamines.

Clinical Use:
Pheochromocytoma - elevated levels of urinary catecholamines.

Progressive muscular dystrophy - increased output of catecholamines.

Myasthenia gravis - increased output of catecholamines.

Comment:
The determination of urinary catecholamines correlates well with the clinical state but there are situations which may lead to elevated levels not related to pheochromocytoma such as vigorous exercise prior to urine collection.
Medications which will lead to fluorescent urinary products are:
- antihypertensive drugs of the alphamethyl dopa configuration
- tetracycline antibiotics
- large doses of the B vitamin complex
- adrenaline and adrenaline-like drugs used in asthmatic seizures
- carbon tetrachloride
- erythromycin
- hydralazine, quinine, quinindine, methenamine and formaldehyde.

Patients should be off such medications at least for one week.

2. Vanillylmandelic Acid (VMA)

Methods:
VMA is extracted from urine, oxidized to vanillin with periodate, vanillin is then purified by solvent partition and quantitated by its absorbance in the near ultraviolet (360 nm).
Clinical Use:

a) confirmation of elevated catecholamine excretion
b) unexplained hypertension with normal catecholamine levels.
c) Neuroblastoma - produces high levels of VMA

Comment: Medications, i.e. anilevidine, aspirin and methocarbamal and foods, i.e. coffee, fruits (bananas) and substances containing vanilla should be excluded before collecting sample.
Normal Range: 0.7-6.8 mg/24 hrs.

3. Metanephrines

Methods: Urine is hydrolyzed, the metanephrines are separated by Amberlite CG-50 cation exchange resin and oxidized by periodate to vanillin which is assayed spectrophotometrically at 360 μm.

Clinical Use: Parameter for determining the abnormal catecholamine production.

Comment: Normal range: 0.3-0.9 mg/24 hrs.

4. Homovanillic Acid (HVA)

Methods: Colorimetric determination - HVA reacts with nitrosonaphthol in nitrous acid and produces the color.

Clinical Use: Neuroblastomas Ganglioneuromas

Comment: Certain cases of neurological tumors show that the urinary abnormality consists almost entirely of excessive excretion of dopamine and its metabolite, HVA.
Normal range: up to 15 mg/24 hrs.
1. Glutamic-Oxalacetic-Transaminase (SGO-T)

Method:

Clinical Use:
- **Myocardial infarction** - following infarction serum SGO-T level begins to rise in about 4-6 hours. A peak level ranging from 2-20 times the upper limit of normal occurs within 24-48 hours after the onset.
- **Pulmonary embolism** - increased levels.
- **Congestive failure with infarcts and other organs** - increased levels.
- **Pancreatitis** - increased levels
- **Skeletal muscle damage** (including post-surgery) - increased levels.
- **Myositis** - increased levels.
- **Liver diseases** - SGP-T is actually more sensitive than SGO-T to hepatocellular damage.
- **Neurological disorders** - increased levels, they are not consistently altered in cases of brain tumors.

Comment:
Since SGO-T is found in all tissues, it is not unexpected that a false positive would occur in certain disease states. In a suspected case of myocardial infarction a sample should be taken as soon as possible to use as a baseline, and to take serial determinations for several days.

Normal values: in serum 12-40 units
in spinal fluid 5-73 units.

2. Serum Glutamic-Pyruvic Transaminase (SGP-T)

Methods:
Clinical Use:
Liver disease - in acute hepatitis or carbon tetrachloride poisoning values over 500 units are usually found.
Acute myocardial infarction - increased levels except in extensive necrosis or hepatic damage resulting from congestive heart failure.

Comment:
In hepatitis the elevations of SGT-T and SGO-T begins several weeks before other tests indicate liver damage. In cirrhosis and metastatic carcinoma levels are quite variable.
Normal values: 11-66 units in male, 5-53 units in female.

3. Lactic Dehydrogenase (LDH)

Methods:

Clinical Use:
- a) Serum LDH elevations in: cirrhosis, hepatitis, metastatic involvement of the liver, pulmonary embolism, progressive muscular dystrophy, megaloblastic anemia, infectious mononucleosis, infarction, transplantation and homograft rejection.
- b) LDH increases in cerebrospinal fluid in: degenerative diseases of the central nervous system, convulsive disorders, head injuries, subarachnoid hemorrhage, meningitis, lymphoma, leukemia, carcinoma.
- c) LDH activity of pleural and peritoneal effusions increased in: containing or in contact with malignant cells.
- d) Elevated levels in urine LDH in: cancer of kidneys or bladder, in glomerulonephritis, malignant hypertension, lupus nephritis, acute tubular necrosis, renal transplantations and homograft rejection, sometimes in pyelonephritis.

Comment:
Normal values of LDH:
- a) in serum - 63 to 155 units in male; 62-131 units in female.
- b) in spinal fluid - 13 to 80 units.
- c) in urine - up to 8300 units/8 hrs.
4. LDH Isoenzymes

Methods:

Clinical Use:
- **Myocardial infarction** - isoenzymes one and two increases in serum.
- **Liver disease** - isoenzyme five increases

Comment:

Normal values:

<table>
<thead>
<tr>
<th>Isoenzyme</th>
<th>% of Total Activity</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15.30</td>
<td>Cardiac</td>
</tr>
<tr>
<td>2</td>
<td>22.50</td>
<td>Cardiac</td>
</tr>
<tr>
<td>3</td>
<td>13.30</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>0.15</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>0.15</td>
<td>Hepatic</td>
</tr>
</tbody>
</table>

5. Aldolase

Methods:

Clinical Use:
- **Acute viral hepatitis** - markedly elevated levels.
- **Progressive muscular dystrophy** - high elevated levels.
- **Myocardial infarction** - elevated levels.
- **Acute pancreatitis** - elevated levels.
- **Diseases involving tissue damage** - elevated levels.

Comment:

Normal range: 13-31 units in male, 11-22 units in female.
6. Creatine Phosphokinase

Methods:

Clinical Use:

- Myocardial infarction
- Progressive muscular dystrophy
- Polymyositis
- Hypothyroidism
- Muscular trauma
- Myonecrosis
- Myoglobinuria
- Severe physical exertion

Comment:

Normal range: up to 4.3 units in male, up to 2.5 units in female. No elevated levels in pulmonary infarction or in parenchymal liver damage.

7. $\alpha$-Hydroxybutyric Dehydrogenase (HBD)

Methods:

Clinical Use:

- Myocardial infarction

- Large increase in HBD activity:
  - Progressive muscular dystrophy
  - Nephrotic syndrome
  - Malignant melanoma
  - Lymphoma
  - Leukemia
  - Megaloblastic anemia

- Chronic and acute liver diseases

Comment:

Normal range: 140-350 units. It has been reported that elevation of HBD is more specific and prolonged than that of SGOT or LDH in cases of myocardial infarction.
8. Isocitric Dehydrogenase (ICD)

Methods:

Clinical Use:
Liver diseases - ICD levels are sensitive reflections of acute hepatic necrosis.

Comment:
Normal range: 50-260 units.

9. 5'-Nucleotidase

Methods:

Clinical Use:
Liver diseases

Comment:
Normal range: 0-1.6 units. In liver diseases the activity of 5'-Nucleotidase parallels the serum alkaline phosphatase but does not increase in rickets or Paget's disease.

10. Alkaline Phosphatase Isoenzymes

Methods:

Determination of the percent thermostable fraction of serum AP - an aliquot of serum is heated for 10' at 56°, the AP concentration of unheated and heat treated serum is then determined.

Clinical Use:
The percent thermostable fraction has no significance for serum AP values in the normal range, but for elevated serum AP levels.
a) Values of greater than 35%. Hepatic disease or disease with liver being the predominant tissue involved.

b) Values of 25% to 35%. A combination of hepatic and skeletal disease in various proportions.

c) Values of less than 25%. Skeletal disease with increased osteoblastic activity.

   Paget's disease of bone – liver isoenzyme responsible for elevated AP.

   Malabsorption – bone isoenzyme elevated.

   Cirrhotics – intestinal isoenzyme mostly responsible for elevated AP.

   Tumors – the so-called Regan isoenzyme has been found in about 3% of patients with variety tumors.

Comment:

Normal range: total serum AP activity is 4-17 (King-Armstrong Units).

Revealing the thermolability of bone enzyme and the relative thermostability of liver AP, it was concluded that hepatobiliary enzyme could be distinguished from skeletal enzyme by heating for 10 min. at 56°.

11. Gamma Glutamyl Transpeptidase (GGT)

Methods:

Note: GGT enzyme test is an exquisitely sensitive measure of pathological processes occurring in the liver.

Clinical Use:

Note: GGT enzyme test is an exquisitely sensitive measure of pathological processes occurring in the liver.

   Chronic and subacute hepatitis – increased GGT – level.
   Cirrhosis of the liver – increased GGT – level.
   Intra- or extrahepatic obstruction disease – elevated GGT – level.
Malignancies in liver, bile ducts, head of the pancreas - markedly increased GGT-level.
Detection of liver damage due to alcoholism - GGT determination is more sensitive than the transaminases.

Comment:
Normal range in serum is for males under 28 mU/ml, for females under 18 mU/ml, for adolescents under 45 mU/ml.

12. Red Cell Enzymes

Methods:
G-6-PD Quantitative test

Red Cell Enzyme Screening Tests (G-6-PD Screening test - visual detection of a fluorescent spot is consistent with the presence of the enzyme in the hemolysate, while a dark UV-adsorbing spot indicates absence of the enzyme).

Clinical Use:
Glucose-6-Phosphate Dehydrogenase (G-6-PD) Deficiency - three major types of G-6-PD-deficiency:
a) type A, found in black subjects
b) Mediterranean type, found in Caucasians and Orientals
c) the rare congenital, non-spherocytic anemia

Pyruvate Kinase deficiency - hemolytic anemia, no additional distinguishing or pathognomonic clinical features.

Triosephosphate Isomerase (TPI) deficiency - red cell TPI deficiency shows a severe hemolytic anemia together with a progressive neurologic disorder.

NADH Diaphorase deficiency - accumulation of methemoglobin which is characterized in life-long cyanosis.

Glutathione Reductase - congenital non-spherocytic hemolytic anemia.
APPENDIX 7

VIRUSES WHICH REQUIRE PURIFICATION
<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Virus Group</th>
<th>Type</th>
<th>Strain</th>
<th>Other Viruses (Virus/Test/Titer)</th>
<th>Bacterial Sterility</th>
<th>Mycoplasma</th>
<th>Refer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-001-511-553</td>
<td>Picornavirus</td>
<td>1</td>
<td>LSc 2ab</td>
<td>Other viruses (Virus/test/titer)</td>
<td>ECHO 11/SN/10 vs 26TCID&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Neg</td>
<td>44, 47</td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td></td>
<td>Coxsackie A-9 (Griggs)</td>
<td>Polio 1/SN/1:58</td>
<td>Polio 1/SN/1:58</td>
<td>Polio 3/SN/1:20</td>
</tr>
<tr>
<td></td>
<td>Poliovirus</td>
<td></td>
<td></td>
<td>Coxsackie B-3 (Nancy)</td>
<td>Polio 1/SN/1:58</td>
<td>Polio 3/SN/1:20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO 4 (DuToit)</td>
<td>Polio 1/SN/1:58</td>
<td>Polio 3/SN/1:20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO 11 (Gregory)</td>
<td>Polio 1/SN/1:58</td>
<td>Polio 3/SN/1:20</td>
<td></td>
</tr>
<tr>
<td>V-002-511-556</td>
<td>Picornavirus</td>
<td>2</td>
<td>P-712</td>
<td>Other viruses (Virus/test/titer)</td>
<td>ECHO 11/SN/10 vs 26TCID&lt;sub&gt;50&lt;/sub&gt;</td>
<td>Neg</td>
<td>44, 47</td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td></td>
<td>Polio Types 1, 3</td>
<td>Polio 1/SN/1:58</td>
<td>Polio 3/SN/1:20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poliovirus</td>
<td></td>
<td></td>
<td>Coxsackie A Types 7, 9</td>
<td>Polio 1/SN/1:58</td>
<td>Polio 3/SN/1:20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Polio 1/SN/1:58</td>
<td>Polio 3/SN/1:20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>Polio 1/SN/1:58</td>
<td>Polio 3/SN/1:20</td>
<td></td>
</tr>
<tr>
<td>V-005-501-563</td>
<td>Picornavirus</td>
<td>A-2</td>
<td>Fleetwood</td>
<td>Other viruses (Virus/test/titer)</td>
<td>SV-6/SN/1024</td>
<td>Neg</td>
<td>28, 145*</td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td></td>
<td>Polio Types 1, 2, 3</td>
<td>SV-19/SN/128</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coxsackie</td>
<td></td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>SV-19/SN/128</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>SV-19/SN/128</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>SV-19/SN/128</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>SV-19/SN/128</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td>SV-19/SN/128</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td>SV-19/SN/128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-006-501-563</td>
<td>Picornavirus</td>
<td>A-3</td>
<td>Antiserum</td>
<td>Other viruses (Virus/test/titer)</td>
<td>Coxsackie A-8/SN&lt;sub&gt;16&lt;/sub&gt;</td>
<td>SV-19/SN/256</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td></td>
<td>Polio Types 1, 2, 3</td>
<td>Coxsackie A-17/CF/17</td>
<td>SV-29/SN/2248</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coxsackie</td>
<td></td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>Coxsackie A-19/CF/15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Coxsackie A-20/CF/24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>Coxsackie A-24/CF/32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>Coxsackie A-24/CF/32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td>SV-32/SN/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Simian Types-27 Types</td>
<td>SV-37/SN/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-8/SN&lt;sub&gt;16&lt;/sub&gt;</td>
<td>SV-19/SN/256</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-17/CF/17</td>
<td>SV-29/SN/2248</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>Coxsackie A-19/CF/15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Coxsackie A-20/CF/24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>Coxsackie A-24/CF/32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>Coxsackie A-24/CF/32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td>SV-32/SN/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Simian Types-27 Types</td>
<td>SV-37/SN/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>4-CDC</td>
<td>Polio Types 1, 2, 3</td>
<td>SV-32/SN/64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coxsackie</td>
<td></td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>SV-37/SN/32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>SV-19/SN/760</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>SV-19/SN/760</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Mycoplasma References</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>------</td>
<td>--------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

271
<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Virus Group</th>
<th>Type</th>
<th>Strain</th>
<th>Other Viruses (Virus/test/titer)</th>
<th>Bacterial Sterility</th>
<th>Mycoplasma</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-012-501-563</td>
<td>Picornavirus</td>
<td>A-9</td>
<td>P.B(Bozek)</td>
<td>Polio Types 1,2,3, Coxsackie A Types 1-24, Coxsackie B Types 1-6, ECHO Types 1-32, Adeno Types 1-18, Reovirus Types 1-18, Simian - 27 Types</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td>Coxsackie</td>
<td></td>
<td>Coxsackie A-6/CF/1:24</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-10/CF/1:24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-11/CF/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-23/CF/1:24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-24/CF/1:24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-32/SN/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-29/SN/1:40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td>Coxsackie</td>
<td>Polio Types 1,2,3, Coxsackie A Types 1-24, Coxsackie B Types 1-6, ECHO Types 1-32, Adeno Types 1-18, Reovirus Types 1,2,3, Simian-27 Types</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-5/CF/1:24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-7/CF/1:24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-14/CF/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-32/SN/1:64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-37/SN/1:125</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-6/SN/1:800</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-19/SN/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-40/SN/1:40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-014-501-563</td>
<td>Picornavirus</td>
<td>A-11</td>
<td>Belgium-1</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Coxsackie A-2/SN/1:16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td>Coxsackie</td>
<td>Polio Types 1,2,3, Coxsackie A Types 1-24, Coxsackie B Types 1-6, ECHO Types 1-32, Adeno Types 1-18, Reovirus Types 1,2,3, Simian-27 Types</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-23/CF/1:16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-32/SN/1:100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-6/SN/1:800</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-19/SN/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-40/SN/1:40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-015-501-563</td>
<td>Picornavirus</td>
<td>A-12</td>
<td>Texas-12</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Coxsackie A5/CF/1:128</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td>Coxsackie</td>
<td>Polio Types 1,2,3, Coxsackie A Types 1-24, Coxsackie B Types 1-6, ECHO Types 1-32, Adeno Types 1-18, Reovirus Types 1,2,3, Simian-27 Types</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-14/CF/1:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-32/SN/1:64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-37/SN/1:128</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-4/SN/1:64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td>Coxsackie</td>
<td>Polio Types 1,2,3, Coxsackie A Types 1-24, Coxsackie B Types 1-6, ECHO Types 1-32, Adeno Types 1-18, Reovirus Types 1,2,3, Simian-27 Types</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-11/SN/1:16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-18/SNinTC/1:100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A-18/SNinM/1:570</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-32/SN/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-19/SN/1:64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-4/SN/1:32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Sterility</td>
<td>Mycoplasma</td>
<td>References</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------</td>
<td>-------------</td>
<td>--------------------------------------------</td>
<td>-----------</td>
<td>------------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>V-017-501-563</td>
<td>Picornavirus</td>
<td>A-14 G-14</td>
<td>Polio Types 1,2,3</td>
<td>ECHO 23/SN/1:16</td>
<td>Neg</td>
<td>28, 145</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>SV-27/SN/1:24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>SV-32/SN/1:32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>SV-37/SN/1:32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>SV-29/SN/1:100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1,2,3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-018-501-563</td>
<td>Picornavirus</td>
<td>A-15 G-9</td>
<td>Polio Types 1,2,3</td>
<td>SV-27/SN/1:32</td>
<td>Neg</td>
<td>28,145*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>SV-32/SN/1:32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>SV-36/SN/1:40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>SV-37/SN/1:32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>SV-19/SN/1:32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1,2,3</td>
<td>SV-4/SN/1:64</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-019-501-563</td>
<td>Picornavirus</td>
<td>A-16 G-10</td>
<td>Polio Types 1,2,3</td>
<td>Coxsackie A-4/CF/1:128</td>
<td>Neg</td>
<td>28, 145</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>Coxsackie A-15/CF/1:32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Coxsackie A-23/CF/1:128</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>SV-32/SN/1:32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>SV-37/SN/1:25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1,2,3</td>
<td>SV-29/SN/1:640</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td>SV-4/SN/1:50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-020-501-563</td>
<td>Picornavirus</td>
<td>A-17 G-12</td>
<td>Polio Types 1,2,3</td>
<td>Coxsackie A-24/SNinTC/1:16 (recip cross)</td>
<td>Neg</td>
<td>28, 145</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>Coxsackie A-24/SNinM/1:128</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>ECHO 17/SN/1:20</td>
<td>Neg</td>
<td>28, 145</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>ECHO 21/SN/1:16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>Coxsackie A-5/CF/1:32 (recip cross)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1,2,3</td>
<td>SV-17/SN/1:25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td>SV-37/SN/1:32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-021-501-563</td>
<td>Picornavirus</td>
<td>18 G-13</td>
<td>Simian-27 Types</td>
<td>Coxsackie A-13/SN(TC)/z1:256 (recip cross)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>Polio Types 1,2,3</td>
<td>Coxsackie A-13/SN(M)/1:2100 (recip cross)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>Coxsackie A-11/SN/1:17 Neg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Coxsackie A-14/SN/1:32 Neg</td>
<td>28, 145*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>ECHO 5/SN/z1:16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>SV 32/SN/1:32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1,2,3</td>
<td>SV 36/SN/1:40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV 37/SN/1:100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV 29/SN/1:160</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV 2/SN/1:128</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma</td>
<td>References</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>--------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td></td>
<td>Polio Types 1, 2, 3</td>
<td>Cox A-17/SNinSH/1:80</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coxsackie</td>
<td></td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>Cox A-20a/3/1:2000</td>
<td>Cox A-20b/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Cox A-20b/5/1:28 (recip cross)</td>
<td>Cox A-20b/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>Cox A-20b/5/1:1260</td>
<td>ECHO 31/5/1:32</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>Cox A-5/5/1:16 (recip cross)</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td>Cox A-6/5/1:64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td>SV-32/SN/1:25</td>
<td>SV-37/SN/1:40</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SV-6/SN/1:250</td>
<td>SV-4/SN/1:64</td>
<td></td>
</tr>
<tr>
<td>V-023A-501-563</td>
<td>Picornavirus</td>
<td>A-20a</td>
<td>Tulane</td>
<td>Polio Types 1, 2, 3</td>
<td>Coxsackie A-20/5/1:40 (recip cross)</td>
<td>--</td>
<td>28, 145*</td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td>1623</td>
<td>Coxsackie A Types 1-24</td>
<td>Coxsackie A-20/5/1:130 (recip cross)</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coxsackie</td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Coxsackie B-20b/5/1:125 (recip cross)</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>Coxsackie B-20b/5/1:400 (recip cross)</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>SV-32/SN/1:25</td>
<td>SV-29/SN/1:320</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td>SV-4/SN/1:128</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td>SV-35/SN/1:50</td>
<td>SV-37/SN/1:128</td>
<td></td>
</tr>
<tr>
<td>V-023B-501-560</td>
<td>Picornavirus</td>
<td>A-20b</td>
<td>Cecil</td>
<td>Polio Types 1, 2, 3</td>
<td>Coxsackie A-20/5/1:400</td>
<td>--</td>
<td>28, 145*</td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>Coxsackie A-20/5/1:1260</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coxsackie</td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Coxsackie A-20/5/1:80</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>Coxsackie A-20a/5/1:2000</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>Coxsackie A-20b/5/1:64 (recip cross)</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td>SV-32/SN/1:25</td>
<td>SV-37/SN/1:128</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td>SV-35/SN/1:50</td>
<td>SV-37/SN/1:128</td>
<td></td>
</tr>
<tr>
<td>V-024-501-563</td>
<td>Picornavirus</td>
<td>A-21</td>
<td>Kuykendall</td>
<td>Polio Types 1, 2, 3</td>
<td>ECHO 23/SN/41/1:16</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>Coxsackie A-5/5/1:12</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coxsackie</td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Coxsackie A-12/5/1:32</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>Coxsackie A-14/5/1:20</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>SV-15/SN/1:32</td>
<td>SV-37/SN/1:25</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td>SV-37/SN/1:64</td>
<td>SV-19/SN/1:100</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td>SV-29/SN/1:128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-025-501-563</td>
<td>Picornavirus</td>
<td>A-22</td>
<td>Chulman</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Coxsackie A-20a/5/1:24</td>
<td>--</td>
<td>28, 145*</td>
</tr>
<tr>
<td></td>
<td>Entero virus</td>
<td></td>
<td></td>
<td>Polio Types 1, 2, 3</td>
<td>cox A-8/5/1:28</td>
<td>Cox A-17/5/1:80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coxsackie</td>
<td></td>
<td></td>
<td>Coxsackie A Types 1-24</td>
<td>Coxsackie A-20a/5/1:2000</td>
<td>Cox A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td>Coxsackie A-20b/5/1:28 (recip cross)</td>
<td>Cox A-20b/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-32</td>
<td>Coxsackie A-20b/5/1:1260</td>
<td>Cox A-20b/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-18</td>
<td>Coxsackie A-5/5/1:16 (recip cross)</td>
<td>Coxsackie A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td>Coxsackie A-6/5/1:64</td>
<td>Coxsackie A-20a/5/1:1600</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Simian-27 Types</td>
<td>SV-32/SN/1:25</td>
<td>SV-37/SN/1:40</td>
<td></td>
</tr>
</tbody>
</table>

774
<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Virus Group</th>
<th>Type</th>
<th>Strain</th>
<th>Other Viruses (Viruses (Virus/test/titer))</th>
<th>Bacterial Sterility</th>
<th>Mycoplasma</th>
<th>Refer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-028-501-563</td>
<td>Picornavirus</td>
<td>B-1</td>
<td>Conn-5</td>
<td>Polio Types 1, 2, 3 Coxsackie B-5/SN/1:160 Coxsackie A-17/SN in TC/ 1:24 (recip cross) Coxsackie A-17/SN in SM/ 1:16 (recip cross) ECHO 23/SN/1:32 Coxsackie A-4/CF/1:32 Adeno Types 1-32 SV-27/SN/1:25 Reovirus Types 1, 2, 3 SV-37/SN/1:64 Simian-27 Types</td>
<td>Neg</td>
<td>--</td>
<td>102, 117*</td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma</td>
<td>References</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>--------------------</td>
<td>------------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>V-033-501-563</td>
<td>Picornavirus</td>
<td>B-6 Schmitt</td>
<td>Polio Types 1,2,3&lt;br&gt;Coxsackie A Types 1-24&lt;br&gt;Coxsackie B Types 1-6&lt;br&gt;ECHO Types 1-30&lt;br&gt;Adeno Types 1-18&lt;br&gt;Simian-27 Types</td>
<td>SV-30/SN/1:16&lt;br&gt;SV-31/SN/1:132&lt;br&gt;SV-32/SN/1:40&lt;br&gt;Coxsackie B01/CF/1:64</td>
<td>Neg</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>102, 115*, 152*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coxsackie</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-034-501-560</td>
<td>Picornavirus</td>
<td>1 Farouk</td>
<td>Polio Types 1,2,3&lt;br&gt;Coxsackie A Types 7,9&lt;br&gt;Coxsackie B Types 1-6&lt;br&gt;ECHO Types 2-32</td>
<td>ECHO 8/SN/1:300</td>
<td>Neg</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ECHO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-034-501-563</td>
<td>Picornavirus</td>
<td>1 Farouk</td>
<td>Polio Types 1,2,3, ECHO 8/SN/1:1000&lt;br&gt;Coxsackie A Types 7,9, 11, 13, 15, 18&lt;br&gt;Coxsackie B Types 1-6&lt;br&gt;ECHO Types 1-25&lt;br&gt;Adeno Types 1-10&lt;br&gt;Simian-21 Types</td>
<td>ECHO 8/CF/1:128 (recip cross)&lt;br&gt;SV-20/SN/1:20&lt;br&gt;SV-36/SN/1:20</td>
<td>Neg</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>99*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ECHO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-036-501-563</td>
<td>Picornavirus</td>
<td>3 Morrisey</td>
<td>Other Viruses (Virus/test/titer)&lt;br&gt;Polio Types 1,2,3&lt;br&gt;Coxsackie A Types 7,9, 11&lt;br&gt;13, 15, 18&lt;br&gt;Coxsackie B Types 1-6&lt;br&gt;ECHO Types 1-25&lt;br&gt;Adeno Types 1-10&lt;br&gt;Simian-21 Types</td>
<td>ECHO 7/SN/1:100&lt;br&gt;SV-10/SN/1:32</td>
<td>Neg</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>99*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ECHO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-037-501-563</td>
<td>Picornavirus</td>
<td>4 Pesascek</td>
<td>Other Viruses (Virus/test/titer)&lt;br&gt;Polio Types 1,2,3&lt;br&gt;Coxsackie A Types 7,9, 11&lt;br&gt;13, 15, 18&lt;br&gt;Coxsackie B Types 1-6&lt;br&gt;ECHO Types 1-25&lt;br&gt;Adeno Types 1-10&lt;br&gt;Simian-21 Types</td>
<td>Adeno 8/SN/1:320&lt;br&gt;SV-19/SN/1:80&lt;br&gt;SV-23/SN/1:16</td>
<td>Neg</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>99*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ECHO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>-------------</td>
<td>---------------------------------</td>
<td>---------------------</td>
<td>------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>V-038-501-560</td>
<td>Picornavirus Enterovirus</td>
<td>5 Noyce</td>
<td>Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxackie A Types 7, 9 Coxackie B Types 1-6 ECHO Types 1-4, 6-32</td>
<td>ECHO 3/SN/1:200 Neg</td>
<td>--</td>
<td>99*</td>
<td></td>
</tr>
<tr>
<td>V-038-501-563</td>
<td>Picornavirus Enterovirus</td>
<td>5 Noyce</td>
<td>Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxackie A Types 7, 9, 11, 13, 15, 18 Coxackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types</td>
<td>SV-19/SN/1:80 Neg</td>
<td>--</td>
<td>99*</td>
<td></td>
</tr>
<tr>
<td>V-039-501-563</td>
<td>Picornavirus Enterovirus</td>
<td>6 D'Amori</td>
<td>Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxackie A Types 7, 9, 11, 13, 15, 18 Coxackie B Types 1-25 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types</td>
<td>ECHO 19/SN/1:30 Neg</td>
<td>--</td>
<td>99*</td>
<td></td>
</tr>
<tr>
<td>V-039B-501-563</td>
<td>Picornavirus Enterovirus</td>
<td>6 Burgess</td>
<td>Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxackie A Types 7, 9, 11, 13, 15, 18 Coxackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 types</td>
<td>ECHO 14/SN/1:32 Neg</td>
<td>--</td>
<td>71, 99*</td>
<td></td>
</tr>
<tr>
<td>V-041-501-563</td>
<td>Picornavirus Enterovirus</td>
<td>8 Bryson</td>
<td>Other Viruses (Virus/test/titer) Polio Types 1, 2, 3 Coxackie A Types 7, 9, 11, 13, 15, 18 Coxackie B Types 1-6 ECHO Types 1-25 Adeno Types 1-10 Simian-21 types</td>
<td>ECHO 1/SN/1:3000 Neg</td>
<td>--</td>
<td>99*</td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma</td>
<td>Refer.</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td>-------------</td>
<td>---------------------------------</td>
<td>---------------------</td>
<td>------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>V-042-511-563</td>
<td>Picornavirus</td>
<td>9 Visop</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Coxsackie A-23/SN/1:4096 Neg Neg 145*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>Polio Types 1, 2, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A Types 7-18, 20a, 20b, 20c, 21, 23, 24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enterovirus Type 59+Candidates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Caldwell &amp; Pett</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-044-501-563</td>
<td>Picornavirus</td>
<td>11 Gregory</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>ECHO 17/SN/1:128 Neg -- 99*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>Polio Types 1, 2, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A Types 7, 9, 11, 12 15, 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Simian-21 Types</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-045-501-563</td>
<td>Picornavirus</td>
<td>12 Travis</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>ECHO 1/SN/1:256 Neg -- 99*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>Polio Types 1, 2, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A Types 3, 7 - 18, 20a, 20b, 20c, 21, 23, 24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Reovirus Types 1, 2, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Enterovirus Type 59 + Candidates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Caldwell + Pett</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-046-501-563</td>
<td>Picornavirus</td>
<td>13 DelCarmen</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Coxsackie A-7/SN/1:25 Neg -- 99*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Enterovirus</td>
<td></td>
<td>Polio Types 1, 2, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie A Types 7, 9, 11, 13 15, 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Coxsackie B Types 1-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ECHO Types 1-25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adeno Types 1-10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Simian - 21 Types</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility Mycoplasma Refer.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>-------------</td>
<td>----------------------------------</td>
<td>---------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-049-501-563</td>
<td>Picornavirus</td>
<td>16 Harrington</td>
<td>Other Viruses(Virus/test/titer) ECHO 17/SN/1:40 Adeno 3/SN/1:16 ECHO Types 1-25 Adeno Types 1-10 Simian-21 Types</td>
<td>Neg -- 99*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-050-501-563</td>
<td>Picornavirus</td>
<td>17 CHHE 29</td>
<td>Other Viruses (Virus/test/titer) Adeno7/SN&lt;1:16</td>
<td>Neg -- 99*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-052-501-563</td>
<td>Picornavirus</td>
<td>19 Burke</td>
<td>Other Viruses (Virus/test/titer) ECHO 7/SN&lt;1:16 ECHO 11/SN&lt;1:40 SV-17/SN/1:16</td>
<td>Neg -- 99*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-053-501-563</td>
<td>Picornavirus</td>
<td>20 JV-1</td>
<td>Other Viruses (Virus/test/titer) SV-12/SN/1:23 SV-17/SN/1:32 SV-18/SN/1:20 SV-20/SN/1:20 SV-23/SN/1:10 SV-27/SN/1:16 ECHO 21/CF/1:64</td>
<td>Neg -- 99*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma Ref</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>---------------------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>V-055-501-563</td>
<td>Picornavirus</td>
<td>22</td>
<td>Harris</td>
<td>Other viruses (Virus/test/titer)&lt;br&gt;Polio Types 1, 2, 3&lt;br&gt;Coxsackie A Types 7, 9, 11, 13, 15, 18&lt;br&gt;Coxsackie B Types 1-6&lt;br&gt;ECHO Types 1-25&lt;br&gt;Adeno Types 1-10&lt;br&gt;Simian-21 Types&lt;br&gt;SV-17/SN/1:24&lt;br&gt;SV-27/SN/1:20</td>
<td>Neg</td>
<td>--</td>
<td>99*</td>
</tr>
<tr>
<td>V-056-501-563</td>
<td>Picornavirus</td>
<td>23</td>
<td>Williamson</td>
<td>Other viruses (Virus/test/titer)&lt;br&gt;Polio Types 1, 2, 3&lt;br&gt;Coxsackie A Types 7, 9, 11, 13, 15, 18&lt;br&gt;Coxsackie B Types 1-6&lt;br&gt;ECHO Types 1-25&lt;br&gt;Adeno Types 1-10&lt;br&gt;Simian-21 Types&lt;br&gt;SV-17/SN/1:24&lt;br&gt;SV-27/SN/1:20</td>
<td>Neg</td>
<td>--</td>
<td>99*</td>
</tr>
<tr>
<td>V-057-501-563</td>
<td>Picornavirus</td>
<td>24</td>
<td>DeCamp</td>
<td>Other viruses (Virus/test/titer)&lt;br&gt;Polio Types 1, 2, 3&lt;br&gt;Coxsackie A Types 7, 9, 11, 13, 15, 18&lt;br&gt;Coxsackie B Types 1-6&lt;br&gt;ECHO Types 1-25&lt;br&gt;Adeno Types 1-10&lt;br&gt;Simian-21 Types&lt;br&gt;SV-17/SN/1:24&lt;br&gt;SV-27/SN/1:20</td>
<td>Neg</td>
<td>--</td>
<td>99*</td>
</tr>
<tr>
<td>V-058-501-563</td>
<td>Picornavirus</td>
<td>25</td>
<td>JV-4</td>
<td>Other viruses (Virus/test/titer)&lt;br&gt;Polio Types 1, 2, 3&lt;br&gt;Coxsackie A Types 7, 9, 11, 13, 15, 18&lt;br&gt;Coxsackie B Types 1-6&lt;br&gt;ECHO Types 1-25&lt;br&gt;Adeno Types 1-10&lt;br&gt;Simian-21 Types&lt;br&gt;SV-17/SN/1:24&lt;br&gt;SV-27/SN/1:20</td>
<td>--</td>
<td>--</td>
<td>99*</td>
</tr>
<tr>
<td>V-113-501-053</td>
<td>Picornavirus</td>
<td>1B</td>
<td>B-632</td>
<td>Other viruses (Virus/test/titer)&lt;br&gt;1A, 1A(JH), 13, 1B(k779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 34, 35, 36, 37, 39, 40, 41, 42, 42(248A0), 44, 49, 50</td>
<td>Rhinovirus type 1B(k778)/SN/1:192</td>
<td>Neg</td>
<td>--</td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma</td>
<td>Ref.</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------</td>
<td>------</td>
<td>--------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>--------------------</td>
<td>------------</td>
<td>------</td>
</tr>
<tr>
<td>V-107-501-053</td>
<td>Picornavirus</td>
<td>2</td>
<td>HGP</td>
<td>Other viruses (Virus/Test/Titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.</td>
<td>Rhinovirus type 2/SN/1:164</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td>V-119-501-053</td>
<td>Picornavirus</td>
<td>3</td>
<td>Antiserum</td>
<td>Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.</td>
<td>Rhinovirus type 17/SN/1:48</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td>V-120-501-053</td>
<td>Picornavirus</td>
<td>6</td>
<td>Thompson</td>
<td>Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.</td>
<td>Rhinovirus type 35/SN/1:48</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td>V-102-501-053</td>
<td>Picornavirus</td>
<td>13</td>
<td>353</td>
<td>Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.</td>
<td>Rhinovirus type 41/SN/1:48</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td>V-140-511-053</td>
<td>Picornavirus</td>
<td>23</td>
<td>100319</td>
<td>Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B(K779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.</td>
<td>Rhinovirus type 49/SN/1:256</td>
<td>30/SN/1:48</td>
<td>Neg</td>
</tr>
<tr>
<td>V-108-501-053</td>
<td>Picornavirus</td>
<td>32</td>
<td>363</td>
<td>Other viruses (Virus/test/titer) 1A, 1A(JH), 1B, 1B (779), 2, 3, 4, 5, 6, 13, 14, 15, 16, 17, 23 (100319), 26(127-1), 29(179E), 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 42(248A), 44, 49.</td>
<td>Rhinovirus type 1A/SN/1:384</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma</td>
<td>Ref.</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>--------------------</td>
<td>------------</td>
<td>------</td>
</tr>
<tr>
<td>V-167-511-053</td>
<td>Picornavirus Rhinovirus</td>
<td>42</td>
<td>248A</td>
<td>Other viruses (Virus/test/titer)</td>
<td>Rhino.-5/SN/52</td>
<td>Neg</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1A, 1A(JH), 1B, 18(K799), 2, 3, 4, 5, 6, 13, 14, 15, 16</td>
<td>13/SN/34</td>
<td>97, 119, 127, 134, 140, 147, 149, 155</td>
<td></td>
</tr>
<tr>
<td>V-116-501-053</td>
<td>Picornavirus Rhinovirus</td>
<td>49</td>
<td>8213</td>
<td>Other viruses (Virus/test/titer)</td>
<td>Rhinovirus type 2/SN/1:192</td>
<td>Neg</td>
<td>--</td>
</tr>
<tr>
<td>V-148-501-057</td>
<td>Picornavirus Rhinovirus</td>
<td>--</td>
<td>611-CV35</td>
<td>Other viruses (Virus/test/titer) Coryzavirus Types 34 thru 54</td>
<td>CV41/SN/1:40</td>
<td>--</td>
<td>154A</td>
</tr>
<tr>
<td>V-207A-501-565</td>
<td>Adenovirus (Human)</td>
<td>7a</td>
<td>S-1058</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1 - 30</td>
<td>Adeno 11/HI/1:20-40</td>
<td>Neg</td>
<td>93, 138*</td>
</tr>
<tr>
<td>V-208-501-565</td>
<td>Adenovirus (Human)</td>
<td>8</td>
<td>Trim</td>
<td>Other viruses (Virus/test/titer)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-209-501-565</td>
<td>Adenovirus (Human)</td>
<td>9</td>
<td>Hicks</td>
<td>Other viruses (Virus/test/titer) Adeno types 1-30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-210-501-565</td>
<td>Adenovirus (Human)</td>
<td>10</td>
<td>J.J.</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1 - 30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-211-501-565</td>
<td>Adenovirus (Human)</td>
<td>11</td>
<td>Slobitski</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1-30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-212-501-565</td>
<td>Adenovirus (Human)</td>
<td>12</td>
<td>Huie</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1-30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

282
<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Virus Group Type</th>
<th>Strain</th>
<th>Other Viruses (Virus/test/titer)</th>
<th>Bacterial Sterility</th>
<th>Mycoplasma</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-214-501-565</td>
<td>Adenovirus (Human)</td>
<td>14 DeWit</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1-30</td>
<td>Adeno 7a/HI/1:10-1:160 Neg</td>
<td>Neg</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno 7A(SN)1:20-1:40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-215-501-565</td>
<td>Adenovirus (Human)</td>
<td>15 CH. 38</td>
<td>Other viruses (Virus/test/titer) Adeno Virus type 1-30</td>
<td>Adeno 22/HI/1:20-1:80 Neg</td>
<td>Neg</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno 29/SN/1:160-1:640</td>
<td></td>
<td>138*</td>
</tr>
<tr>
<td>V-216-501-565</td>
<td>Adenovirus (Human)</td>
<td>16 CH79</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1-30</td>
<td>Adeno 4/SN/1:120-1:1280 Neg</td>
<td>Neg</td>
<td>93</td>
</tr>
<tr>
<td>V-219-501-565</td>
<td>Adenovirus (Human)</td>
<td>19 3911</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1-30</td>
<td>Adeno 10/HI/1:40 Neg</td>
<td>Neg</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno 10/HI/indication of cross by some labs 138*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-223-501-565</td>
<td>Adenovirus (Human)</td>
<td>23 2732</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1-30</td>
<td>Adeno 8/HI/1:40 Neg</td>
<td>Neg</td>
<td>93</td>
</tr>
<tr>
<td>V-224-502-565</td>
<td>Adenovirus (Human)</td>
<td>24 3153</td>
<td>Other viruses (Virus/test/titer) Adeno Virus types 1-30</td>
<td>Adeno 15/SN/1:32-1:2560 Neg</td>
<td>Neg</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno 23/SN/1:160-1:160</td>
<td></td>
<td>138*</td>
</tr>
<tr>
<td>V-225-501-565</td>
<td>Adenovirus (Human)</td>
<td>25 BP-1</td>
<td>Other viruses (Virus/test/titer) Adeno Virus types 1-30</td>
<td>Adeno 15/SN/indication of cross by some labs 138*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-229-501-565</td>
<td>Adenovirus (Human)</td>
<td>29 BR-6</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1-30</td>
<td>Adeno 9 + Adeno/25/SN - indicated cross by some labs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-230-501-565</td>
<td>Adenovirus (Human)</td>
<td>30 BP-7</td>
<td>Other viruses (Virus/test/titer) Adeno Types 1-30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-231-501-565</td>
<td>Adenovirus (Human)</td>
<td>31 1315</td>
<td>Other viruses (Virus/test/titer) Adeno Virus Types 1-30</td>
<td>Adeno T-12/SN/1:320 Neg</td>
<td>Neg</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Adeno T-18/SN/1:20 Neg</td>
<td></td>
<td>138*</td>
</tr>
</tbody>
</table>

283
<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Virus Group</th>
<th>Type Strain</th>
<th>Other Viruses (virus/test/titer)</th>
<th>Bacterial Sterility</th>
<th>Mycoplasma</th>
<th>Refer.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. B - Lee, GL, Md, Taiwan</td>
<td>E-Taiwan/HI/1:10 (K10)</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. C - Taylor</td>
<td>C-Taylor/HI/1:20 (RDE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 1-HA-2, Sendai</td>
<td></td>
<td>1:20 (K10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 2-Greer, SV-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 3-SF-4, Mumps, NDV, Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-301-511-552</td>
<td>Myxovirus</td>
<td>Infl. A FR-8/34</td>
<td>Other viruses (Virus/test/titer)</td>
<td>B-Taiwan/HI/1:10 (RDE)</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. A - Swine, FM-1, Jap/305, Jap/355 Lot 2, Jap/170</td>
<td></td>
<td>1:10 (K10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. B - Lee, GL, Md, Taiwan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. C - Taylor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 1-HA-2, Sendai</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 2 - Greer, SV-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 3-SF-4, Mumps, NDV, Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-301-521-552</td>
<td>Myxovirus</td>
<td>Infl. A-1 FM-1/47</td>
<td>Other viruses (Virus/test/titer)</td>
<td>B-Taiwan/HI/1:10 (K10)</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. A - Swine, PR-8, Jap/305, Jap/355 Lot 2, Jap/170</td>
<td></td>
<td>1:10 (K10)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. B - Lee, GL, Md, Taiwan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. C - Taylor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 1-HA-2, Sendai</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 2 - Greer, SV-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 3-SF-4, Mumps, NDV, Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-301-531-552</td>
<td>Myxovirus</td>
<td>Infl. A-2 Japan/305/57</td>
<td>Other viruses (Virus/test/titer)</td>
<td>A-Jap/170/HI/1:800</td>
<td>Neg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. A - Swine, PR-8, FM-1, Jap/170</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Infl. B - Lee, GL, Md, Taiwan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 1-HA-2, Sendai</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 2 - Greer, SV-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 3-SF-4, Mumps, NDV, Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Sterility</td>
<td>Mycoplasma</td>
<td>Refer.</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>-----------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Sterility</td>
<td>Mycoplasma</td>
<td>Refer.</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>-----------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>V-301-581-552</td>
<td>Myxovirus</td>
<td>Infl. A</td>
<td>WS/33</td>
<td>Other viruses (Virus/test/titer)</td>
<td>A-PR8/HI/1:80, SN/1:20(200)</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flu A: PR8/FM-1/Swine/Equine-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Equine-2/WS/Japan 170</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Japan 305/Taiwan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flu B: Lee/Maryland/Great Lakes/</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Taiwan/Singapore</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flu C: Taylor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 1: HA-2</td>
<td>A-PR8/HI/1:80, SN/1:20(200)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 2: Greer/SV-5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 3: SF-4</td>
<td>A-PR8/HI/1:80, SN/1:20(200)</td>
<td></td>
</tr>
<tr>
<td>V-301-591-552</td>
<td>Myxovirus</td>
<td>Infl. A-2</td>
<td>Aichi/2/68</td>
<td>Other viruses (Test/Virus/Titer)</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>flu A-Swine, PR8, FM, Lee, Md., B Taiwan,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B Sing, B Mass, Pl, P2 (Greer &amp; SV-5), P3,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C Taylor, A equi/1:&lt;10; A2 Japan 170, A Equi,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NDV; A2 Japan 305, A2 Taiwan/ 1:20;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HI/ flu A-Swine, PR8, FM, WS, A equi Prague;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B Lee, B Md, B Taiwan, B Sing, B Mass,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C Taylor/ &lt;10; A2 Japan 305 &amp; 170, A2 Taiwan/1:40;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A equi 2 Maimi/1:10; NDV/1:20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SN/flu A-Swine, PR8, FM, Equi, flu B Md, TW, Sing,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NDV, Pl (C-35), P2 (Greer &amp; SV-5), P3 flu C/10,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>flu B Lee/1:10; flu B Mass/ 1:20; flu A Jap 305,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jap 170/1:40; flu A equi 2/1:80; flu A Tw/1:160.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CF/A (Soluble)/1:64; B(Soluble), C(GL), Pl, P2,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>P3, Mumps, P2(SV-5), NDV, NAF/8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HI/flu A-Swine, A-WS-33, A-PR-8-34, 11-FM-1:47,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A-Equi 1 Prague, A-Equi 2 Miami, 1 Lee, 3 Md,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B Taiwan, B Sing, B Mass, NDV, C Taylor/10;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A2 Japan-305, A2 Japan 170/1:10;A2 Taiwan 1:80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

286
<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Virus Group</th>
<th>Type</th>
<th>Strain</th>
<th>Other Viruses (Virus/test/titer)</th>
<th>Bacterial Sterility</th>
<th>Mycoplasma</th>
<th>Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-302-501-552</td>
<td>Myxovirus</td>
<td>Infl. B</td>
<td>Lee/40</td>
<td>Other viruses (Virus/Test/Titer)</td>
<td>B-GL/HI/1:40</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. A - Swine, PR-8, FM-1,</td>
<td>B-Md/HI/1:40</td>
<td>B-Taiwan/HI/1:80 (RDE)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jap/305, Jap/305 lot 2,</td>
<td>1:10 (K10&lt;sub&gt;4&lt;/sub&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jap/170</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. B - GL, Md, Taiwan</td>
<td>C-Taylor/HI/1:40 (RDE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. C - Taylor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 1 - HA-2, Sendai</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 2 - Greer, SV-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 3 - SF-4, Mumps, NDV, Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-302-511-552</td>
<td>Myxovirus</td>
<td>Infl. B</td>
<td>GL/1739</td>
<td>Other viruses (Virus/test/titer)</td>
<td>B-Lee/HI/1:40</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. A - Swine, PR-8, FM-1,</td>
<td>B-Md/HI/1:300</td>
<td>B-Taiwan/HI/1:80 (RDE)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jap/305, Jap/305 lot 2,</td>
<td>1:80 (K10&lt;sub&gt;4&lt;/sub&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jap/170</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. B - Lee, Md, Taiwan</td>
<td>C-Taylor/HI/1:40 (RDE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. C - Taylor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 1 - HA-2, Sendai</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 2 - Greer, SV-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 3 - SF-4, Mumps, NDV, Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-302-521-552</td>
<td>Myxovirus</td>
<td>Infl. B</td>
<td>Maryland</td>
<td>Other viruses (Virus/test/titer)</td>
<td>B-Lee/HI/1:320</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1/59</td>
<td>Infl. A - Swine, PR-8, FM-1,</td>
<td>B-GL/HI/1:320</td>
<td>B-Taiwan/HI/1:320 (RDE)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jap/305, Jap/305 lot 2,</td>
<td>1:60 (K10&lt;sub&gt;4&lt;/sub&gt;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jap/170</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. B - Lee, GL, Taiwan</td>
<td>C-Taylor/HI/1:40 (RDE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. C - Taylor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 1 - HA-2, Sendai</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 2 - Greer, SV-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 3 - SF-4, Mumps, NDV, Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-302-531-552</td>
<td>Myxovirus</td>
<td>Infl. B</td>
<td>Taiwan</td>
<td>Other viruses (Virus/test/titer)</td>
<td>B-Lee/HI/1:40</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2/62</td>
<td>Infl. A - Swine, PR-8, FM-1,</td>
<td>B-GL/HI/1:40</td>
<td>B-Md/HI/1:80</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jap/305, Jap/305 lot 2,</td>
<td>B-Taiwan/HI/1:80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Jap/170</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. B - Lee, GL, Md</td>
<td>C-Taylor/HI/1:40 (RDE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infl. C - Taylor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 1 - HA-2, Sendai</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 2 - Greer, SV-5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Para 3 - SF-4, Mumps, NDV, Measles</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

287
<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Virus Group Type</th>
<th>Strain</th>
<th>Other Viruses (Virus/test/titer)</th>
<th>Bacterial Sterility</th>
<th>Mycoplasma</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-303-501-552</td>
<td>Myxovirus</td>
<td>Infl. C Taylor 1233/47</td>
<td>Other viruses (Virus/test/titer)</td>
<td>A-Jap/170/HI/1:40</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>V-321-511-558</td>
<td>Myxovirus</td>
<td>1 Sendai</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>A-Jap/170/HI/1:40</td>
<td>Neg</td>
<td>Neg</td>
</tr>
</tbody>
</table>

**Catalog #**
- V-302-541-552
- V-303-501-552
- V-321-501-558
- V-321-511-558

**Virus Group Type**
- Infl. B
- Infl. C
- 1
- Sendai

**Strain**
- Singapore
- Taylor
- HA-2
- C-39

**Other Viruses (Virus/test/titer)**
- Infl A: PR3/FM-1/Swine/Equine-1
- Equine-2/WS/Japan 170
- Japan 305/Taiwan
- Infl B: Lee/Maryland/Great Lakes/Taiwan/Singapore
- Influ C: Taylor
- Para 1: HA-2
- Para 2: Greer/SV-5
- Para 3: SH-4

**Bacterial Sterility**
- Neg

**Mycoplasma**
- Neg

**Ref.**
- --
<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Virus Group</th>
<th>Type</th>
<th>Strain</th>
<th>Other Viruses (Test/Virus/Titer)</th>
<th>Bacterial Sterility</th>
<th>Mycoplasma Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-322-503-558</td>
<td>Myxovirus</td>
<td>2</td>
<td>Greer, CA</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>Neut, CF, HI/P1(HA-2), P1(Sendai), P2(SV-5, P3(HAL), P3(SF), Mumps, Measles, NDV, Flu A, Flu B/&lt;1:10</td>
<td>Neg Neg 83, 116A</td>
</tr>
<tr>
<td>V-322-502-558</td>
<td>Myxovirus</td>
<td>2</td>
<td>Greer, CA</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>Neut CF/HI/P1(HA-2), P1(Sendai), P3(HA-1), P3(SF), Flu A, Flu B, Mumps, Measles, NDV/&lt;1:10</td>
<td>Neg Neg 83, 116A</td>
</tr>
<tr>
<td>V-322-501-558</td>
<td>Myxovirus</td>
<td>2-SV</td>
<td>20005-2WR</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>Neut, CF, HI/P1(Sendai), P1(HA-2), P2(Greer), P3(HA-1), P3(SF), NDV, Mumps, Flu A, Flu B/&lt;1:10</td>
<td>Neg Neg 144A</td>
</tr>
<tr>
<td>V-322-512-558</td>
<td>Myxovirus</td>
<td>2</td>
<td>Greer, CA</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>Neut, CF, HI/P1(Sendai), P1(HA-2), P2(Greer), P3(HA-1), P3(SF), NDV, Mumps, Flu A, Flu B/&lt;1:10</td>
<td>Neg Neg 135</td>
</tr>
<tr>
<td>V-322-558</td>
<td>Parainfluenza</td>
<td>2</td>
<td>Greer, CA</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>Neut CF/P4A(M-25), P4B(19503), RS(18537)/&lt;1:10</td>
<td>CF. HI/Flu C/≤1:10</td>
</tr>
<tr>
<td>V-322-502-558</td>
<td>Parainfluenza</td>
<td>2</td>
<td>Greer, CA</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>Neut, CF/P4A(M-25), P4B(19503), RS(18537)/&lt;1:10</td>
<td>CF. HI/Flu C/≤1:10</td>
</tr>
<tr>
<td>V-322-512-558</td>
<td>Parainfluenza</td>
<td>2-SV</td>
<td>20005-2WR</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>Neut CF/P4A(M-25), P4B(19503), RS(18537)/&lt;1:10</td>
<td>CF/Adeno Group, Eaton Agent/≤1:10</td>
</tr>
<tr>
<td>V-322-558</td>
<td>Parainfluenza</td>
<td>2</td>
<td>Greer, CA</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>Neut CF/P4A(M-25), P4B(19503), RS(18537)/&lt;1:10</td>
<td>CF/Adeno Group, Eaton Agent/≤1:10</td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma</td>
<td>Refer.</td>
</tr>
<tr>
<td>------------</td>
<td>------------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------</td>
<td>---------------------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>V-323-502-558</td>
<td>Myxovirus</td>
<td>3</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>Neut, CF, HI/P1(Sendai), P1(HA-2), P2 (Greer), P2(SV-5), NDV, Measles, Flu A, Flu B/1:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parasinfluenza</td>
<td></td>
<td></td>
<td>Neut, CF/P4A(M-25), P4B(19503), Mumps, RS(Long), RS(19537)/1:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Neut/P3(SF)/1:20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CF/P3(SF)/1:80 Flu C, Adeno Grp. Eaton Agent/1:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HI/P3(SF)/1:320 Mumps/1:40 Flu C/1:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-325-502-558</td>
<td>Myxovirus</td>
<td>--</td>
<td>Other Viruses (Virus/Test/Titer)</td>
<td>Para 2-SV-5/HI/1:10-1:20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paramyxovirus</td>
<td></td>
<td>Para 2 - (SV-5)</td>
<td>Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 2 - (Greer)</td>
<td>Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Para 3 - (HA-1)</td>
<td>Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-326-501-558</td>
<td>Myxovirus</td>
<td></td>
<td>Other viruses (Virus/Test/Titer)</td>
<td>Para 2-SV-5/CH/1:20</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Newcastle Disease</td>
<td></td>
<td>Para 1 - Sendai</td>
<td>Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paramyxovirus</td>
<td></td>
<td>Para 2 - SV-5</td>
<td>Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Roakin Virus</td>
<td></td>
<td></td>
<td>Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-327-501-558</td>
<td>Myxovirus</td>
<td></td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td>P1(Sendai), P2(HA-2), P2(SV-5), P2(Greer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Respiratory Long</td>
<td></td>
<td></td>
<td>Neut/RS(18537), RS(1075)/1:10</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>syncytial</td>
<td></td>
<td></td>
<td>CF/Flu C, Adeno Grp. Eaton Agent/1:10, RS(18537)/1:40, RS(1075)/1:80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma</td>
<td>Refer.</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>---------------------</td>
<td>------------</td>
<td>-------</td>
</tr>
<tr>
<td>V-329-501-555</td>
<td>Myxovirus, Canine Distemper Virus</td>
<td>Lenderle Avirulent</td>
<td>Other viruses (Virus/test/titer) Messles Infectious Canine Hepatitis</td>
<td>Neg</td>
<td>Neg</td>
<td>--</td>
</tr>
<tr>
<td>V-346-501-558</td>
<td>Herpesvirus Simplex</td>
<td>Mayo 1814</td>
<td>Other viruses (Virus/test/titer) Herpes simplex (HF) Herpes simplex (McIntyre) B Virus (E-2490) B Virus (Sabin) Pseudorabies (Aujeszky)</td>
<td>Herpes simplex (HF)/SN/1:128 Herpes simplex (McIntyre)/SN/1:128 B Virus (E-2490)/SN/1:4 potentiated B Virus (Sabin)/SN/1:4 potentiated</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>V-347-501-558</td>
<td>Herpesvirus B</td>
<td>Lilly E-2490</td>
<td>Other viruses (Virus/test/titer) Herpes simplex (HF) Herpes simplex (McIntyre) B Virus (E-2490) B Virus (Sabin) Pseudorabies (Aujeszky)</td>
<td>Herpes simplex (HF)/SN/1:128 B Virus (E-2490)/SN/1:4 potentiated B Virus (Sabin)/SN/1:4 potentiated</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>V-348-501-558</td>
<td>Herpesvirus Pseudorabies Aujeszky</td>
<td></td>
<td>Other viruses (Virus/Test/Titer) Pseudorabies (Kaplan) Herpes simplex (Mayo 1814) Herpes simplex (HF) Herpes simplex (McIntyre) B Virus (E-2490) B Virus (Sabin)</td>
<td>Pseudorabies (Kaplan)/SN/1:64 B Virus (E-2490)/SN/1:4 potentiated B Virus (Sabin)/SN/1:4 potentiated</td>
<td>Neg</td>
<td>Neg</td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility Mycoplasma Refer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>------------------</td>
<td>--------</td>
<td>---------------------------------</td>
<td>--------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-501-701-562</td>
<td>Bwamba</td>
<td>Bwamba</td>
<td>Smithburn (M459)</td>
<td>Other Arboviruses CF/Bunyamwera - unassigned 1 Neg; Group Capim 1 Neg; Group Patois 1 Neg; Group Guama 1 Neg; Small Groups 6-8, 9a, 9d, 10, 10a, 11a, 13, 14a, 16, 16a, 16b Neg; Group VSV 4 Neg; Ungrouped 1, 2, 8, 10-13, 15, 16, 19, 20, 28, 29, 31, 32, 35-51 Neg; HI/Group A 1, 2, 4, 5 Neg; Group B 3, 7, 11, 15, 17, 23, 26, 27, 31, 33, 35, 37 Neg; Group C 6, 8, Neg; 7 (+1/10); Group Patois 1, 2, Neg; Group Bunyamwera 1-3, 6-10, 13 Neg; 12 (+1/10); Group Phlebotomus 1, 2, 4-6, 8, 11 Neg; Group Simbu 2-4 Neg; 8 (+1/10); Minor Groups 2, 2b, 3, 4, 4a, 10a, 15, 15a, 15b Neg; Ungrouped 32, 36, 43 Neg; Group California 2, 6, 9, 10 Neg; Group Capim 4 Neg; Neg Neg --</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-502-701-562</td>
<td>California</td>
<td>California</td>
<td>Encephalitis BFS 283</td>
<td>Other arboviruses CF Bunyamwera-Unassigned 1 Neg; Group Capim 1 Neg; Group Patois 1 Neg; Group Guama 1 Neg; Small Groups 6-8, 9a, 9d, 10, 10a, 11a, 13 14a, 16, 16a, 16b Neg; Group VSV 4 Neg; Ungrouped 1, 2, 8, 10-13, 15, 16, 19, 20, 28, 29, 31, 32, 35-51 Neg; HI/Group A 1, 2, 4, 5 Neg; Group B 3, 7, 11, 15, 17, 23, 26, 27, 31, 33, 35, 37 Group C 6, 8 Neg 7 (+1/10); Group Patois 1, 2, Neg; Group Bunyamwera 1-3, 6-10, 13 Neg; 12 (+1/10); Group Phlebotomus 1, 2, 4-6, 8, 11 Neg; Group Simbu 2-4 Neg; 8 (+1/10); Minor Groups 2, 2b, 3, 4, 4a, 10a 15, 15a 15b Neg; Ungrouped 32, 36, 43 Neg; Group Capim 4 Neg; Neg Neg --</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility Mycoplasma Refer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>-------------------</td>
<td>--------</td>
<td>----------------------------------</td>
<td>-------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-503-701-562</td>
<td>Phlebotomus Sicilian Fever</td>
<td>Sabin</td>
<td>Other arboviruses (Test/Virus/Titer)</td>
<td>CF/Group Simbu 1-9 Neg; Group Bunyamwera 2, 3, 6-9, 11, 16 Neg; Group Tacaribe 1, 2, 5-7 Neg; Group Phlebotomus 2 (8/8), 1, 5-7, 11 Neg; HI/Group A 1-10, 12, 13, 15, 16, 19 Neg Group B 2-7 Neg; Group C 3, 5-10 Neg; Group Simbu 3, 4, 8, 10 Neg; Group Phlebotomus 1, 2, 4-6, 8, 11, Neg; Group Guama 3, 4 Neg; Group California 2 Neg; Group Tutlock 15 Neg; Group Capim 4 Neg; Neg Neg --</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-505-701-562</td>
<td>Simbu Oropouche</td>
<td>TRV1 9760</td>
<td>Other arboviruses (Test/Virus/Titer)</td>
<td>CF/Bunyamwera - unassigned 1 Neg; Group Capim 1 Neg; Group Patois 1 Neg; Group Guama 1 Neg; Small Groups 6-8, 9a, 9d, 10, 10a, 11a, 13, 14a, 16 16a, 16b, Group VSV 4 Neg; Ungrouped 1, 2, 8, 10-13, 15, 16, 19, 20, 28, 29 31, 32, 35-51 Neg; HI/Group A 1, 2, 4, 5 Neg; Group B 3, 7, 11, 15, 17 23, 26, 27, 31, 33, 35, 37 Neg; Group C 6, 8, Neg; Group Patois 1, 2, Neg; Group Bunyamwera 1-3, 6-10, 12, 13 Neg; Group Phlebotomus 1, 2, 4-6, 8, 11 Neg; Group Simbu 2, 3, 8 Neg; Minor Groups 2, 2b, 3, 4, 4a, 10a, 15, 15a, 15b Neg; Ungrouped 32, 36, 43, Neg; Group California 2, 6, 9, 10 Neg; Group Capim 4 Neg. Neg Neg --</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-506-701-562</td>
<td>Ungrouped Colorado Florio</td>
<td>Tick Fever</td>
<td>Other Arboviruses (Virus/Test/Titer)</td>
<td>CF/Group Simbu 1-9 Neg; Group Bunyamwera 2, 3, 6, 8, 9, 11, 16 Neg; Group Tacaribe 1, 2, 5, 7 Neg. Neg Neg --</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>CF/Group</td>
<td>Sterility</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
<td>--------</td>
<td>--------</td>
<td>----------------------------------</td>
<td>----------</td>
<td>-----------</td>
</tr>
<tr>
<td>V-509-701-562</td>
<td>B</td>
<td>Ilheus</td>
<td>TRVL</td>
<td>Other viruses (Test/Virus/Titer)</td>
<td>Group B 3 (4/4); 1, 4, 7 (8/4); 17, 23 (16/16); 6, 11, 35, 36, 37 (&lt;1/4)</td>
<td>5800</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Group A 3, 4, 6, 17, 20 Neg; Group Bunyamwera 2, 3, 9, 11, 16 Neg; Group C 7 Neg; Group Guama 1-5 Neg; Group Patois 1 Neg; Group Changuinola 1, 2 Neg; Group Simbu 2, Neg; Group Phlebotomous 4, 7 Neg; Minor Groups 2, 3, 3a, 7, 8, 13, 15, 16 16a, 16b, 24 Qalyub Neg; Ungrouped 11 Neg; HI/Group B 7 (640); 23 (320); 31, 33 (160); 1, 3, 36 (80); 4 (40); 11, 17 (10); 6, 35, 37 (&lt;10) Neg</td>
<td></td>
</tr>
<tr>
<td>V-510-701-562</td>
<td>Guama</td>
<td>Guama</td>
<td>TRVL</td>
<td>Other viruses (Test/Virus/Titer)</td>
<td>Group A 3, 4, 6, 17, 20 Neg; Group B 7, 11, 15, 27, 28, 31, 33, 35-37 Neg; Group C 7 Neg; Group Patois 1, 2 Neg; Group Bunyamwera 2, 3, 9, 11, 13, 16 Neg; Group Simbu 2 Neg; Group Phlebotomous 4, 7 Neg; Group Changuinola 2 Neg; Minor Groups 2, 3, 3a, 7, 8, 13, 15, 16, 16a, 16b Neg; Ungrouped 11 Neg;</td>
<td>33579</td>
</tr>
<tr>
<td>V-511-701-562</td>
<td>California</td>
<td>Melao</td>
<td>TRVL</td>
<td>Other viruses (Test/Virus/Titer)</td>
<td>CF/Group California: 7(4/64); 2-4, 9, 10 (8/64)</td>
<td>9375</td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type</td>
<td>Strain</td>
<td>Other Viruses (Test/Virus/Titer)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>-------------</td>
<td>--------</td>
<td>---------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-534-70;-562</td>
<td>Simbu</td>
<td>Buttonwillow</td>
<td>A7956</td>
<td>Other arboviruses (Test/Virus/Titer) CF/Group Simbu 3, 4, 5, 7 Neg. Turlock, EEE, SLE Neg Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-701-511-570</td>
<td>Reovirus</td>
<td>1 Hull-5727</td>
<td></td>
<td>Other viruses (Test/Virus/Titer) SN/Reo 2/1:32 - Reo 3/1:16 HI/Reo 2/1:16 - Reo 3/1:16 Neg Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-702-501-570</td>
<td>Reovirus</td>
<td>2 Jones</td>
<td></td>
<td>Other viruses (Test/Virus/Titer) Sn/Reo 1/1:16 - Reo 3/1:16 HI/Reo 1/1:16 - Reo 3/1:8 Neg Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V-703-501-570</td>
<td>Reovirus</td>
<td>3 Abney</td>
<td></td>
<td>Other viruses (Test/Virus/Titer) SN/Reo 1/1:128 - Reo 2/1:32 HI /Reo 1/1:16 - Reo 2/1:16 Neg Neg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalog #</td>
<td>Virus Group</td>
<td>Type</td>
<td>Strain</td>
<td>Other Viruses (Virus/test/titer)</td>
<td>Bacterial Sterility</td>
<td>Mycoplasma</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>----------</td>
<td>--------</td>
<td>----------------------------------</td>
<td>---------------------</td>
<td>------------</td>
</tr>
<tr>
<td>G-201-701-567</td>
<td>C</td>
<td>Grouping Ascitic Fluid</td>
<td>--</td>
<td>Other arboviruses (Test/Virus/Titer)</td>
<td>CF/Group Simbu: 1-9-Neg (1:16)*; Group Bunyamwera: 2, 3, 6-9, 11, 16 Neg (1:10 Neg</td>
<td>--</td>
</tr>
<tr>
<td>G-203-701-567</td>
<td>Simbu</td>
<td>Grouping Ascitic Fluid</td>
<td>--</td>
<td>Other arboviruses (Test/Virus/Titer)</td>
<td>CF/Group Bunyamwera 2, 3, 6-9, 11, 16 Neg; Group Tacaribe 1, 2, 5-7, Neg.</td>
<td>--</td>
</tr>
<tr>
<td>G-205-701-567</td>
<td>Bunyamwera</td>
<td>Grouping Ascitic Fluid</td>
<td>--</td>
<td>Other arboviruses (Test/Virus/Titer)</td>
<td>CF/Group Simbu 1-3, 5-9 Neg; 4(1/4); Group Tacaribe 1, 2, 5-7 Neg. HI/Group A 1-10, 12, 13, 15, 16, 19 20 Neg; Group B 2-7 Neg; Group C 3, 5-10 Neg; Group Phlebotomous 1, 2, 4-6, 8, 11, Neg; Group Guama 3, 4 Neg; Group Simbu 3, 4, 8, 10, Neg; Group Capin 4 Neg;</td>
<td>--</td>
</tr>
<tr>
<td>G-209-701-567</td>
<td>A</td>
<td>Grouping Ascitic Fluid</td>
<td>--</td>
<td>Other arboviruses (Test/Virus/Titer)</td>
<td>CF/Group Simbu 4, 8 Neg; 1, 6-(1/4); 2, 3, 5, 7 9-(1/4); Group Bunyamwera 3, 6, 8, 11, 16-(1/4); 2, 9-(1/4); Group Tacaribe 1, 2, 5-7 Neg; HI/Group B 2-7 Neg; Group C 3, 5-9 Neg; Group California 2 Neg; Group Simbu 3, 4, 8 Neg; Group Phlebotomus 1, 2, 4-7, 8, 11, Neg; Group Bunyamwera 1-3, 6-18, 17 Neg; Group Guama 3, 4 Neg; Group Turlock 1 Neg; Group Capin 4 Neg; Group Simbu 10 Neg;</td>
<td>--</td>
</tr>
<tr>
<td>G-215-701-567</td>
<td>Group Capin</td>
<td>Grouping Ascitic Fluid</td>
<td>--</td>
<td>Other arboviruses (Test/Virus/Titer)</td>
<td>CF/Group Bunyamwera 2, 11, 16 Neg; California, Quaranfil, Guama, Tlucus Neg;</td>
<td>--</td>
</tr>
</tbody>
</table>
REFERENCES TO VIRUS LIST


APPENDIX 8

GRAPH OF ELECTROPHORESIS EVOLUTION
AUTOMATION

Radioimmunoassay

IMMUNOASSAY

Electrophoresis
1. assay of specific properties
2. viscometry
3. refractometry
4. hemaglutination
5. immunofluorescence
6. radioimmunoassay diffusion
7. ouchterlong
8. direct nephelometry
9. inhibition nephelometry
10. hemagl. inhibition
11. turbidimetry
12. oudin
13. polarization fluorescence
14. immunoelectrophoresis
15. immunofixation
16. counter electrophoresis
17. "capture zone"
18. crossed antigen-antibody electrophoresis
19. rehydratable film
20. variable EOM
21. acrylamide
22. isotachophoresis
23. pevicon
24. isoelectric focusing
25. chemical and precipitation techniques
26. paper
27. agar
28. agarose gel
29. starch
30. cellulose acetate "mini"
31. cellulose acetate "standard"
32. free