

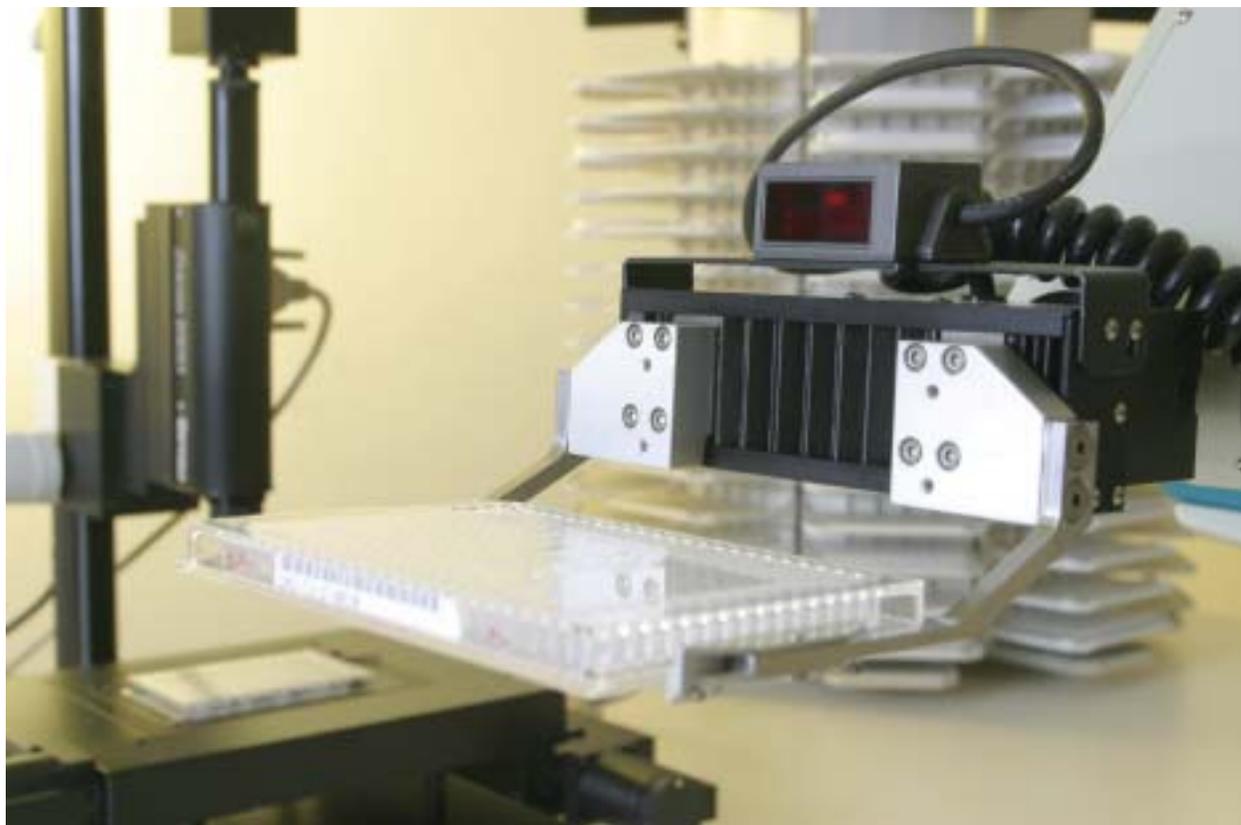
## Protein Crystal Growth

**P**roteins are the chemical building blocks from which all human cells, organs, and tissues are made. They also serve as the hormones, enzymes, and antibodies that help the body fight off invading germs. Determining the structure of a protein enables medical researchers to create pharmaceuticals that will either help or prevent a protein from doing its job. Through a process known as structure-based drug design, researchers use the knowledge of a protein's structure to develop new drugs to treat a variety of diseases. The predominate method of determining a protein's structure is by X-ray crystallography, which involves growing protein crystals and exposing them to an X-ray beam to determine their atomic structure.

In order to rapidly and efficiently grow crystals, tools were needed to automatically identify and analyze the growing process of protein crystals. To meet this need,

Diversified Scientific, Inc. (DSI), with the support of a **Small Business Innovation Research (SBIR)** contract from NASA's Marshall Space Flight Center, developed CrystalScore™ the first automated image acquisition, analysis, and archiving system designed specifically for the macromolecular crystal growing community. It offers automated hardware control, image and data archiving, image processing, a searchable database, and surface plotting of experimental data. CrystalScore is currently being used by numerous pharmaceutical companies and academic and nonprofit research centers. DSI, located in Birmingham, Alabama, was awarded the patent "Method for acquiring, storing, and analyzing crystal images" on March 4, 2003.

Another DSI product made possible by Marshall SBIR funding is VaporPro™ a unique, comprehensive system that allows for the automated control of vapor



The award-winning CrystalScore™ is an automated image acquisition, analysis, and archiving system for protein crystallization.



VaporPro™ provides solutions for higher quality crystal growth.

diffusion for crystallization experiments. The product contains complete hardware and user-friendly software and was awarded patent protection in June 2002. Its cutting-edge features include individual vapor diffusion profiles for each chamber, as well as automated time-lapse image acquisition, crystal detection, and liquid handling.

With a mission to make drug discovery easier, faster, and more affordable, DSI manufactures and markets products based on the crystallography and structure-based drug design research conducted at the University of Alabama at Birmingham's Center for Biophysical Sciences and Engineering (CBSE), a NASA Commercial Space Center. Formed as a CBSE spinoff company in 1995, DSI has received several SBIR contracts from both NASA and the National Institutes of Health to develop products that support crystal growth for all crystallographic applications, including drug design and protein engineering. The CBSE's commercial research is made possible through NASA's Space Product Development Program, a partnership between NASA, academia, and U.S. industry.

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