

National Aeronautics and Space Administration

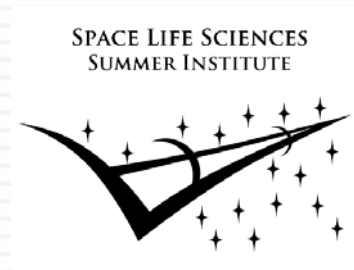
Investigation of FGF23 in Bed-Rest and Space Flight

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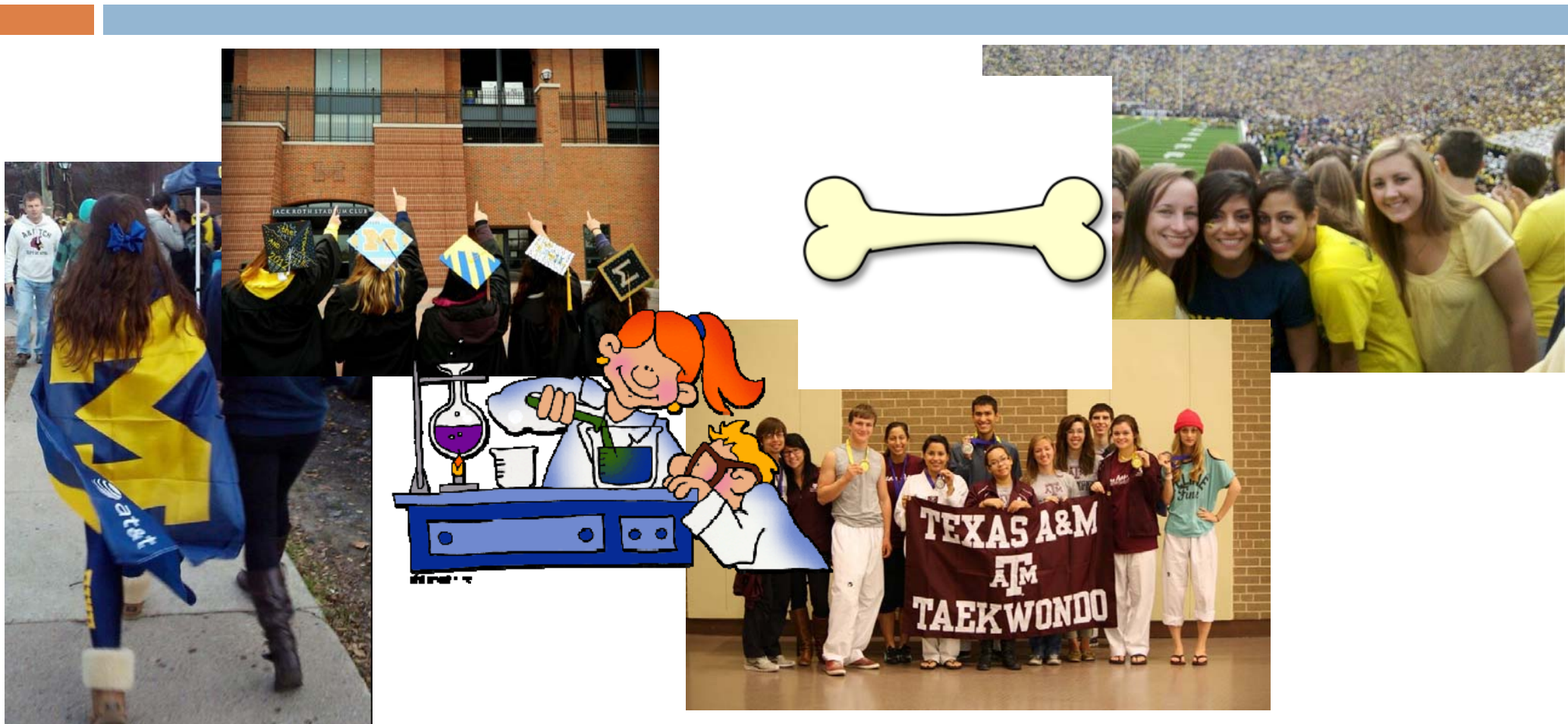
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Introduction

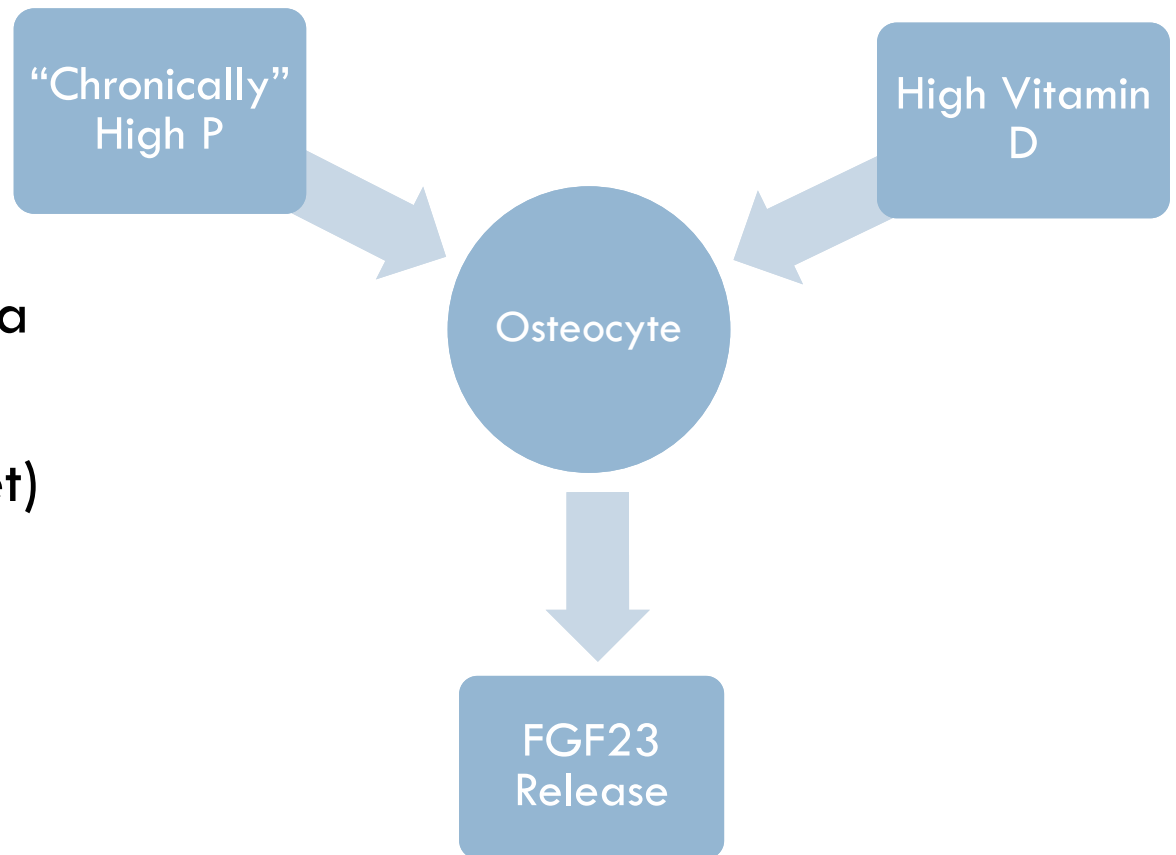


Objectives of Internship

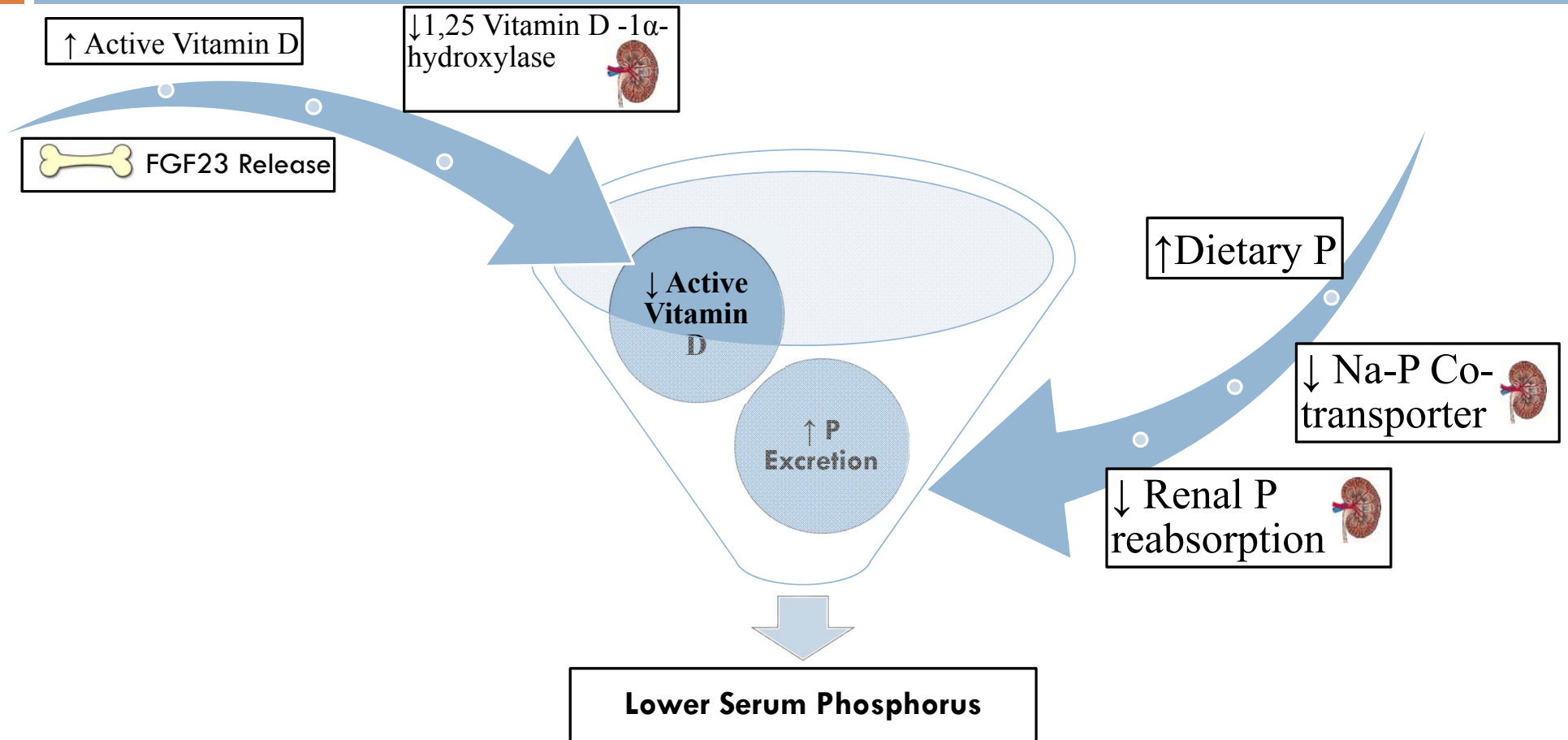
- To study the changes in FGF23 during Bed rest and Space Flight
- Proposal and acquisition of funding prior to internship

Background

- P is stored in bone like Ca
- High P:Ca in astronaut diet (but not bed rest diet)
- Low active Vitamin D levels in astronauts



The FGF23 Story



Risks

- Low Vitamin D status
- Low Calcium levels
- Demineralization
- Does this play a role in space flight related bone loss?
- Does this contribute to kidney stone risk?

Methods



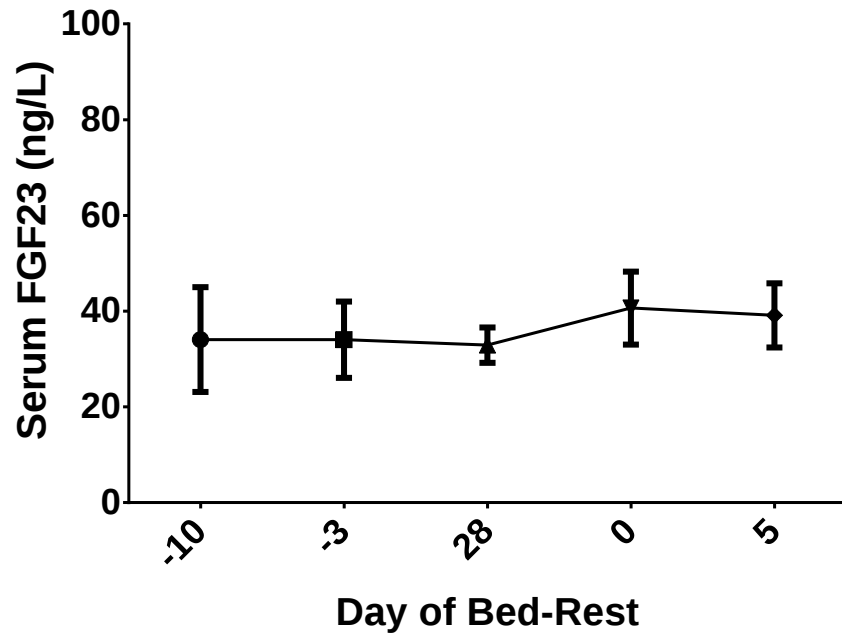
- Serum samples were run using the intact FGF23 ELISA kit, iFGF23, from Kainos lab in Japan



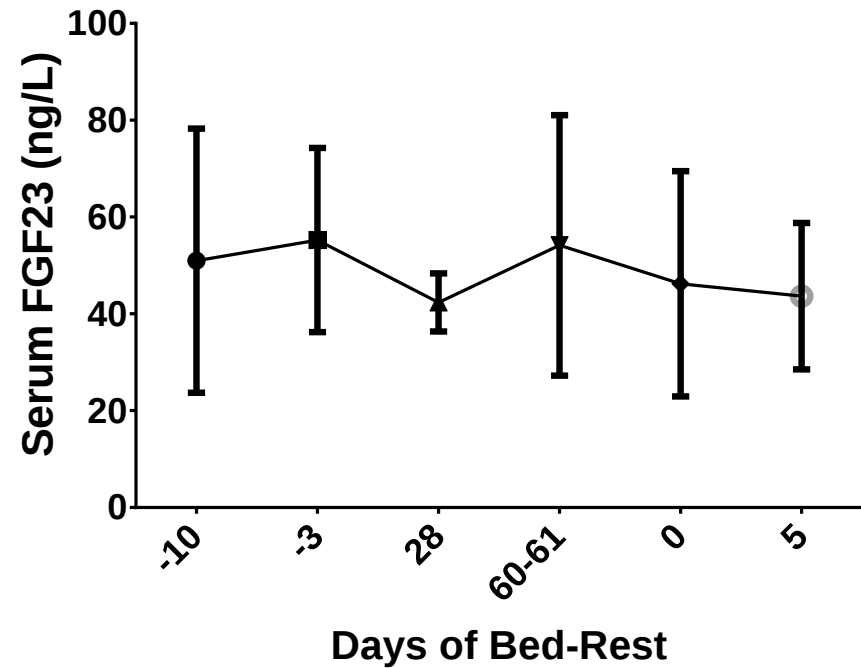
- The collected FGF23 data was compared to the database of information on each of the test subjects

Bed-Rest Results

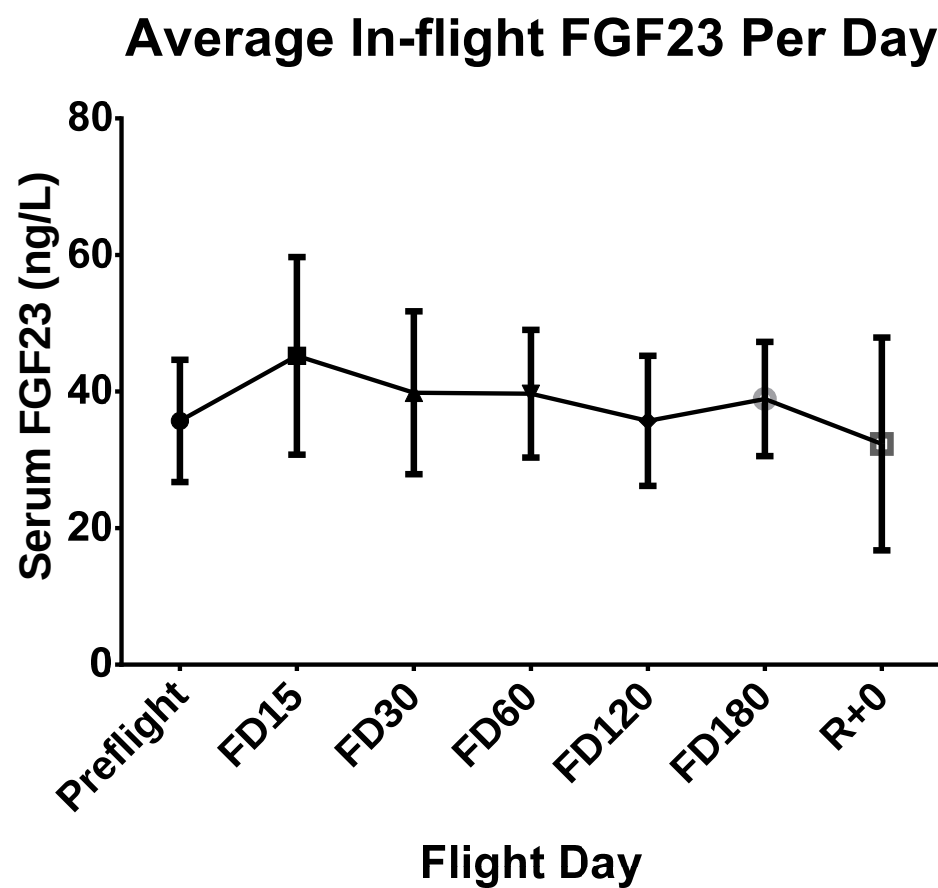
Average FGF23 in 60 Days of Bed-Rest



Average FGF23 for 90 Days Bed-Rest



Flight Data Results



Discussion

- Compared FGF23 to:
 - ▣ Vitamin D intake
 - ▣ Phosphorus intake and excretion
 - ▣ Phosphorus:Calcium Ratio in diet
 - ▣ Parathyroid hormone

- Initial glance at the results
 - ▣ Changes in flight appeared more variable than bed-rest, likely related to bed rest diet consistency

Summary

- The purpose of my project was to determine the effect of disuse situations, such as space flight, on serum FGF23
- To do this I learned how to:
 - ▣ Proposal writing
 - ▣ Learning how to run a new assay
 - ▣ Graph out relationships between collected FGF23 data and existing data

