



InvestiGators Research Honors Society

Peggy R. Borum, Food Science and Human Nutrition Department, University of Florida, Gainesville, FL 32611-0370

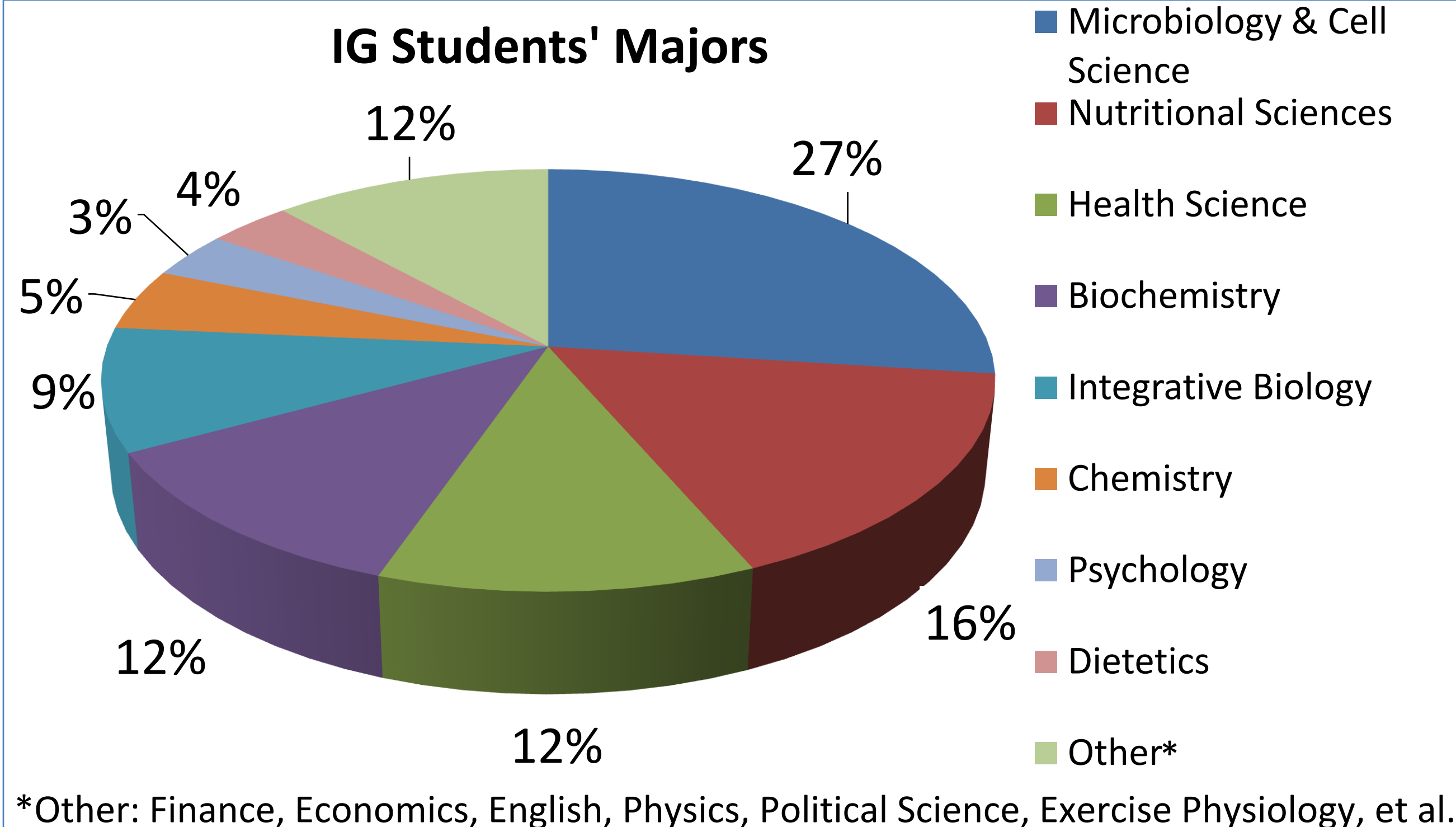


Abstract

The InvestiGators (IG) research honors society at the University of Florida allows outstanding undergraduate students to be professional basic and clinical research scientists. The usual paradigm of the undergraduate student working closely with a graduate student is altered to three interdisciplinary teams working directly with the professor. The Gator Team provides a detailed metabolic assessment for each pediatric HIV patient in a weekly clinic and addresses different hypotheses concerning HIV associated metabolic syndrome. The KetoGator Team has a primary role in a General Clinical Research Center project evaluating the clinical aspects of altered ratios of dietary macronutrient intake on changes in metabolism and electrical properties of the brain. The Carnitine Team uses clinical samples and a piglet model to evaluate the role of carnitine in normal metabolism and in the metabolism of patients seen in clinic by the other two teams. Members learn basic, clinical and translational science through direct experience. In addition to experimental design, careful implementation of experiments, data analyses, and reporting of results, IG members must learn how to work together in an interdisciplinary team of peers as well as more senior scientists. They learn at an early career stage what the professional world is really like and they leave significant footprints in translational science and clinical care.

Introduction

The IG philosophy is undergraduate students are young colleagues of the professor – not helpers for graduate students or postdocs. Students work with a group of peers to reach a common research goal. They experience translational science through both animal and clinical research addressing real world problems. IG is divided into interrelated three teams: KetoGator Team; Gator Team; Carnitine Team.



Recruitment

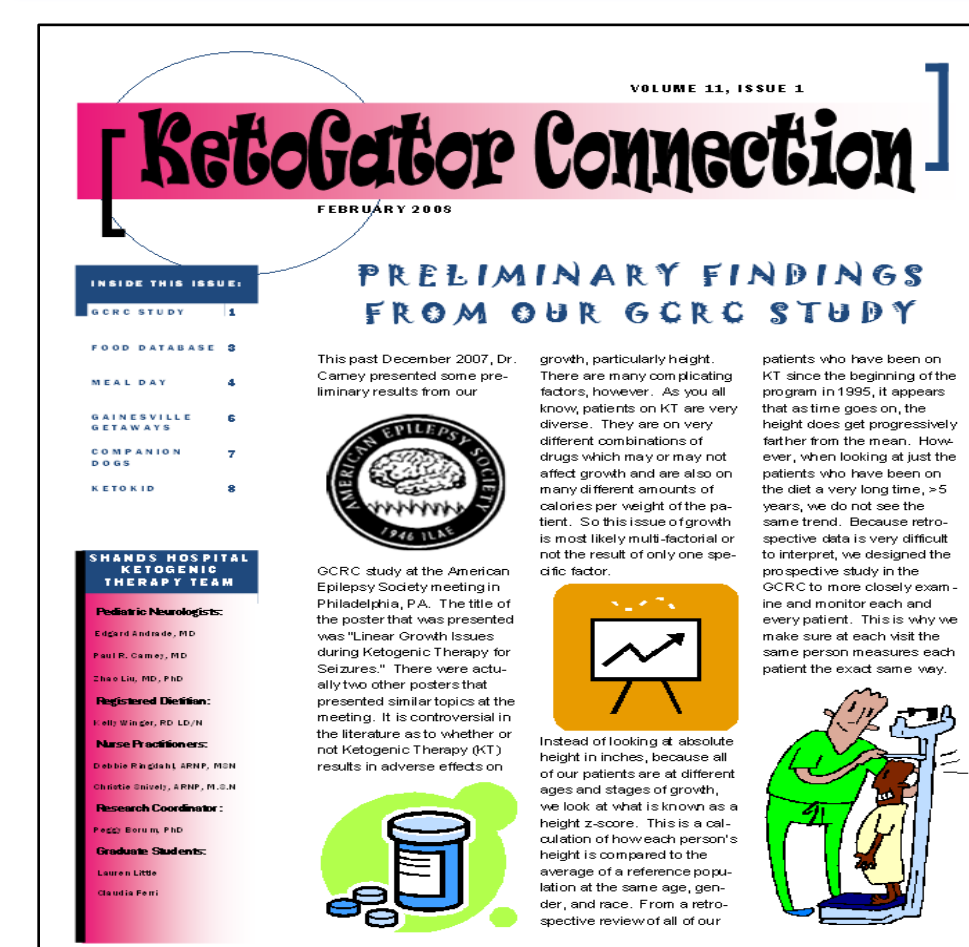
- Call for interviews via several campus e-mail listings
- First interview by two representatives from each team
- Second interviews by individual teams
- Third interview by faculty advisor
- Applicants must agree to commit a minimum of 12 months and 15-20 hours per week, but more is expected.

<http://borum.ifas.ufl.edu/investigators/investigators.htm>

The Teams

KetoGator Team

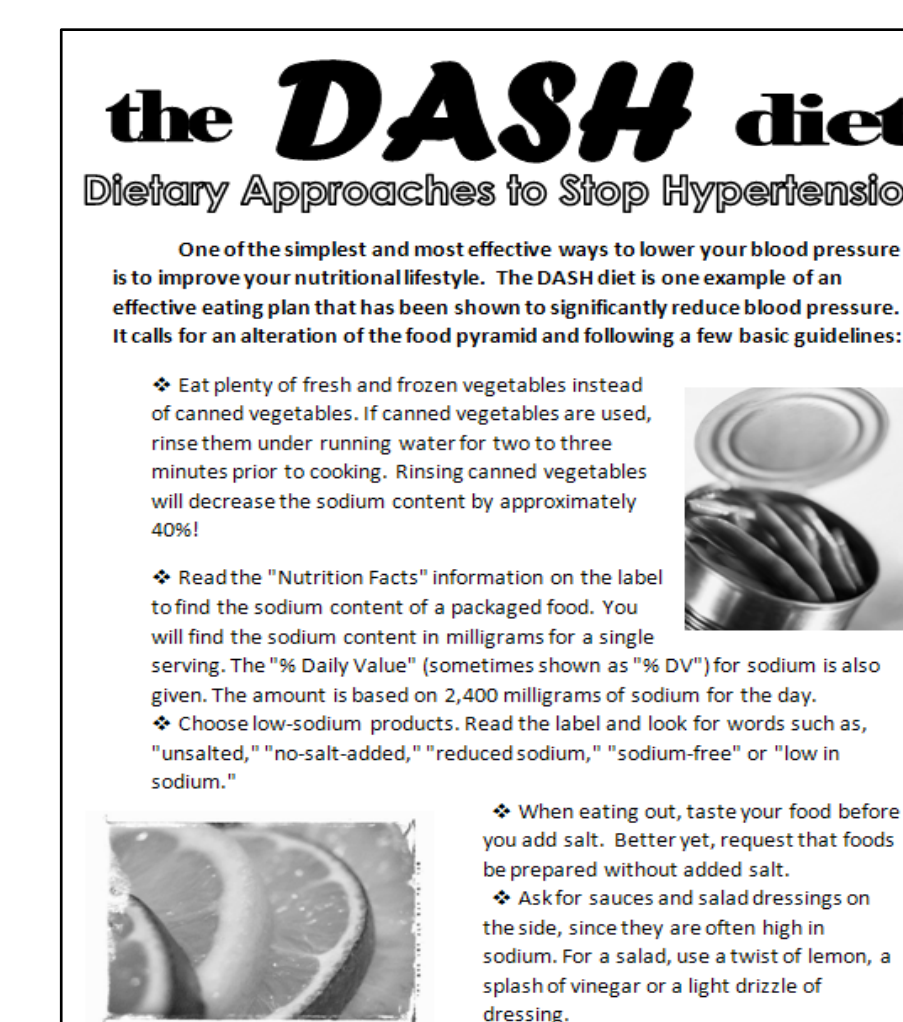
- The KetoGators work with children treated at the University of Florida Ketogenic Therapy For Seizures Program. The therapy alters macronutrient intake to as much as 90% of calories from fat and requires the caregiver to precisely weigh every food and to closely monitor the patients' dietary intake.
- Members provide support for the caregiver in numerous forms including weekly phone calls and a quarterly newsletter that is in its tenth year of continuous publication.
- KetoGators hold periodic Meal Days to test new recipes to help with patient compliance.



- The KetoGator Team not only participates in, but provides the people power and framework of an ongoing General Clinical Research Center protocol.
- Nutrient content must be known for food to be included in the patient's diet prescription. The team maintains a database, available on the web, of more than 800 commonly used foods.

Gator Team

- At a weekly pediatric HIV clinic, students collect and analyze data (dietary intake, anthropometric measurements, et al) according to Standard Operating Procedures and prepare Metabolic Assessments used by physicians in treatment.
- Each student is responsible for a set of patients. Students prepare individualized educational packets for their patients and present it to them at each clinic visit.



- Baby books are provided to new mothers at each clinic visit with a variety of tips for infant care that are specific for the age of the infant at that visit.
- The educational material for pre-teens includes age-appropriate information about a nutrient and an activity in addition to results from their dietary recall obtained at the previous clinic visit.
- The team compiles a database profiling the patient population to test various hypotheses concerning HIV-associated metabolic dysfunction.

Carnitine Team

- The Carnitine Team uses a Piglet Neonatal Intensive Care Unit to perform experiments that are too invasive to conduct in humans.
- They perform chemical assays such as an LC-MS/MS assay for individual acylcarnitines.



- Biological samples from humans and animal models are used to investigate the compartmentalization and function of carnitine in different organs and physiological states.
- In collaboration with the Gator Team, the Carnitine Team studies metabolic abnormalities in HIV-positive patients and the possible role of carnitine in treatment.
- In collaboration with the KetoGator Team, they conduct studies using piglet models and pediatric patients to study the potential use of carnitine in the treatment of seizures.

Operation

- Leadership**
 - Each team has one to three captains to keep the group organized and directed.
- Weekly Meetings**
 - All InvestiGators with the advisor for training (bloodborne pathogens, etc.), sharing of information among teams, and to practice for national presentations.
 - Each team without the faculty advisor to evaluate progress of the past week and plan the following week.
 - Each team with the faculty advisor to discuss current work and plan future projects.
 - The Gator Team and the KetoGator Team separately with the faculty advisor to discuss the patients coming to their respective clinics that week.
 - The Carnitine team with the faculty advisor for the discussion of a relevant journal article.
 - Individual meetings with the faculty advisor as needed.
- Communication**
 - Each student prepares a daily laboratory work report to facilitate communication with the faculty advisor.
 - Faculty advisor reads the work report, adds comments as appropriate and returns it to the member.
 - Online discussion boards are used to encourage rapid and constant communication between members.

Conclusion

- These carefully-selected undergraduate students might require more individual guidance than graduate students, but are capable of doing first class research.
 - Three KetoGator, two Gator, and two Carnitine members are presenting their results at EB 2008.¹
- IG is often their first experience of responsibly dealing with real world issues.
- They learn at an early stage what the professional world is really like while leaving significant footprints in translational science and clinical care.
- Students often leave IG with greater maturity and an increased awareness of the fields of research and medicine.
- Graduating seniors often go on to medical, dental, graduate, and pharmacy schools.
- They are accustomed to academic success, but hungry for continuing challenges and thirsty for a taste of the professional world that they are approaching with a mixture of idealism, wonder, and uncertainty.

1. Abstracts 1088.9, 1088.10, 1088.11, 1088.7, 1088.12, and Late Breaking Abstracts