

## **Grammer Research Interests**

I am interested in the behavior of simple organisms as a means of understanding how they get about in their native environments. Thus, work in my research groups has focused on stimulus-response mechanisms in microscopic organisms. The more highly developed line of research is the investigation of the olfactory response in the nematode, *Caenorhabditis elegans*. This worm, ca. 1 mm in length, detects a wide variety of odorants, some it likes and some it does not. *C. elegans* has many characteristics which make it ideal for undergraduate research, including the availability of mutants affecting its nervous system and behavior.

A more recent line of work is the study of responses of a single-celled plant to light. We are working on the development of a quantitative assay for phototaxis in the freshwater algae, *Chlamydomonas reinhardtii*. This single cell exhibits both attraction and aversion to light, depending upon its intensity, and, like *C. elegans*, many mutants are available for the study of its light detector, the eyespot, and its means of movement, the flagella.

## **Published Abstracts**

*[Students listed from 2006 until present also presented their research on campus as part of their senior research experience. This includes a poster presentation at the School of Sciences Undergraduate Research Symposium (SURS) in the fall and an oral presentation at the Belmont Undergraduate Research Symposium (BURS) in the spring.]*

Gabrielle Facey. "Examination of Chemotaxis Assays that Quantify Repulsion and Attraction in the Olfactory Response of *C. elegans*".

2010. *Tennessee Academy of Science Fall 2010 120<sup>th</sup> Meeting*. Cookeville, Tennessee. (Student poster presentation)

2011. *Tennessee Academy of Science Spring 2011 Middle Tennessee Collegiate Division*. Nashville, Tennessee. (Student oral presentation)

Lynette C. Rives. "Phototaxis in Wild-Type and Mutant *Chlamydomonas reinhardtii*"

2009. *Tennessee Academy of Science Spring 2009 Middle Tennessee Collegiate Division*. Nashville, Tennessee. (Student oral presentation)

2008. *Tennessee Academy of Science Fall 2008 118<sup>th</sup> Meeting*. Nashville, Tennessee. (Student poster presentation)

Sachin Amin. "Biphasic Olfactory Response of *C. elegans* to Benzaldehyde via Capillary Assay" 2009. *Tennessee Academy of Science Spring 2009 Middle Tennessee Collegiate Division*. Nashville, Tennessee. (Student oral presentation)

2008. Faculty for Undergraduate Neuroscience Symposium – Society for Neuroscience. Washington D.C. (Student poster presentation)

M. Christina Inman. "Investigating a Possible Connection between Pathogenic Avoidance and Reproductive Output of *Caenorhabditis elegans*".

2009. *Tennessee Academy of Science Spring 2009 Middle Tennessee Collegiate Division*. Nashville, Tennessee. (Student oral presentation)

2008. Faculty for Undergraduate Neuroscience Symposium – Society for Neuroscience. Washington D.C. (Student poster presentation)

Katie F. Saba. "Effects of *tax-4* Mutation on Chemosensation in *C. elegans*".

2005. Belmont Undergraduate Research Symposium

Burgandy Moss. "Chemotaxis in *Caenorhabditis elegans*".

2005. Belmont Undergraduate Research Symposium

Kristin M. Giardina. "*Caenorhabditis elegans*: A Model for Study of Chemotaxis".

2004. Belmont Undergraduate Research Symposium

Jessica E. Wenzler. "Chemotactic Responses of C-Fern Sperm".

2004. Belmont Undergraduate Research Symposium

Allison Mills. "Effects of Caffeine on Anaerobic Threshold Workouts and 5K Racing".

2002. Belmont Undergraduate Research Symposium

Baley F. Allred IV. "Effects of High and Low Intensity Exercise on Blood Pressure".

2001. Belmont Undergraduate Research Symposium

Allison L. Turner. "The Effects of Oral Creatine Supplementation on Activity in Rats".

2000. Belmont Undergraduate Research Symposium

B. K. Parsley. "The Effects of Garlic on Hypertension in the Spontaneously Hypertensive Rat Model".

2000. Belmont Undergraduate Research Symposium

Halina Onishko "The Influence of Ethyl Alcohol on the Progress of Fermentation in Yeast".

1999. Belmont Undergraduate Research Symposium

Deborah G. W. Bulla "A Blood Analysis for Persons in Retail and Service Occupations Exposed to Lead-Based Vinyl Mini-Blinds".

1997. Belmont Undergraduate Research Symposium

Lee P. Young "An Analysis of Antibiotic Resistant Coliform Bacteria in Locally Purchased Ground Beef".

1997. Belmont Undergraduate Research Symposium

Clark A Rose II "Effect of Length of Treatment on Growth Rate for Human Growth Hormone Therapy".

1995. Belmont Undergraduate Research Symposium

Thomas H. Rhodes "The Effects of Bacterial Attachment with Varying Temperatures, pH, and Ion Concentrations".

1995. Belmont Undergraduate Research Symposium

Tonja Johnson "Drinking Water Analysis for Lead Content and the Presence of Coliform Bacteria *Escherichia coli*".

1995. Belmont Undergraduate Research Symposium

### **Honors Theses**

Ananta Bhatt "Neural Pathways Involved in Olfactory Imprinting in *C. elegans*".

2006. Faculty for Undergraduate Neuroscience Symposium – Society for Neuroscience (Washington DC)

Eric McLaughlin. "Detection of *Borrelia lonestari* in *Amblyomma americanum* Ticks of Sumner County, Tennessee".

2002. Tennessee Academy of Science Collegiate Division

2002. Belmont Undergraduate Research Symposium

Angela Korrekt. "Physician-Patient Communication and Its Relationship to Patient Satisfaction".

2000. Belmont Undergraduate Research Symposium

C. Ryan Beck. "Binding of R17 RNA Phage to the F-pili of *E. coli*".

1998. Belmont Undergraduate Research Symposium

Cory Barnett. "Purification and Capsid Assembly of R17 Phage by Gel Filtration Column Chromatography".

1998. Belmont Undergraduate Research Symposium

Katie A. Powell. "Does Training Environment Influence Incidence of Exercise-Induced Asthma for Belmont's Soccer and Basketball Teams?"

1997. Belmont Undergraduate Research Symposium

Deanna M. Smith. "Tobacco Eradication in the Pediatric Environment".

1996. Belmont Undergraduate Research Symposium

Christopher M. Griffith. "The Effects of Plasma Glucose Levels on Anaerobic and Short-Term Aerobic Performance".

1994. Belmont Undergraduate Research Symposium