

Application Form:
Deadline: April 15, 2005

Mail the following form with (1) a copy of your high school transcripts and (2) a letter of recommendation from a high school teacher to:

Dr. Mary Constant Byrne
Muhlenberg College
Department of Biology
2400 Chew St
Allentown, PA 18104

Name _____

Address _____

Phone _____

School _____

Expected Year of Graduation _____

Research project: Please rank your top 3 choices by writing the corresponding project letter below!

1. _____

2. _____

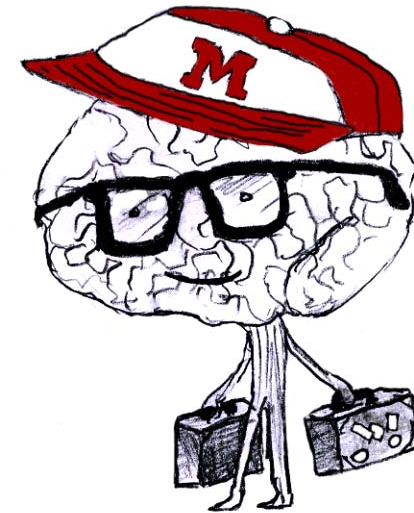
3. _____

For more information about Brain Camp visit our website at
www.muhlenberg.edu/depts/biology

Any questions? Contact Dr. Mary Constant Byrne (Brain Camp Director) at byrne@muhlenberg.edu

BRAIN CAMP

MUHLENBERG COLLEGE
JULY 10-15, 2005



Brain Camp is a science camp for high school students interested in the biology of the brain. Over the course of one week, students will explore the inner workings of the nervous system and direct their own research project.

Brain Camp, 2005

Brain Camp is a residential science camp for motivated, energetic students who are interested in the wonders of the brain. Through hands-on laboratory experiences, students will explore the anatomy, physiology, and development of the brain.

Brain Camp is a one-week summer experience for high school students who will be beginning their junior or senior year in fall, 2005. Participation in Brain Camp is free, pending acceptance (see application on reverse). All expenses, including housing, meals, and social activities are included. This camp is funded by a generous grant from the federal government (FIPSE).

During Brain Camp, participants will live in supervised student housing on the Muhlenberg College campus, attend interactive classes on brain function, and pioneer independent research in a neuroscience laboratory.

Each day at Brain Camp includes:

- Morning sessions that demonstrate **hot topics** in neuroscience through hands-on activities:
 - A. Like da Vinci — Exploring Brain Anatomy
 - B. The Beginning of the Brain
 - C. Fight or Flight? What's really going on in Fear Factor Contestants?
 - D. The Gap Between Sensation and Perception: What you see is not what you Perceive!
 - E. This is your Brain on Drugs
 - F. How to Make a Brain
- Afternoon **research projects** that let students design their own experiments. Projects are directed by faculty from the biology, neuroscience and psychology departments at Muhlenberg College.
- Evening **social activities** including Dorney Park, outdoor movies, and more!

Research Projects. Please indicate your **top three** choices on the application form.

A. The Effects of Toxins on the Development of the Salamander Nervous System. Students will design an experiment investigating the toxic effects of caffeine, nicotine or a pesticide on the development of the nervous system in salamander (axolotl) embryos. The students will take digital pictures of the embryos as they develop with and without the toxin, recoding the differences and similarities between the treatments. **Dr. Elizabeth McCain**

B. The Role of Serotonin in the Aggressive Behavior of Crayfish. Students will design experiments to understand the role of serotonin in the aggressive behavior of crayfish. Students will learn how to administer drug treatments to an animal as well as the methods used to record animal behavior. **Dr. Paul Meier**

C. Autonomic Responses during Poker. Students will examine galvanic skin responses (a measurement of perspiration) and other autonomic changes during the game of poker. The larger goal of this research is to determine if physiological responses can be observed during bluffing, winning and overtaking opponents. **Dr. Jeffery Rudski**

D. Aroma "Therapy". Research indicates that certain odors influence arousal (peppermint raises arousal and lavender lowers arousal). Are there optimal levels of arousal for basic cognitive and perceptual tasks? We will experiment with different odors to manipulate arousal and then investigate how differences in arousal influence cognition and perception. **Dr. Laura Snodgrass**

E. The Stroop Effect. The Stroop Effect is a cognitive/perceptual phenomenon in which people have trouble naming the ink color of words when the words are color names that do not match the ink color. For example when the word is blue but is written in red ink, people have trouble saying "red" for the ink color.. We will design experiments to investigate this effect. **Dr. Laura Snodgrass**

F. Hemispheric Asymmetry. Recent research indicates that the right and left hemisphere of the brain process different information. A tachistoscope is often used to present visual stimuli separately to the right and left hemisphere of the brain. Using a tachistoscope, we will design experiments to assess processing differences between the two hemispheres of the brain. **Dr. Laura Snodgrass**

G. Behavioral Genetics of the Nematode. Students will work in an active research lab to understand how neurons develop and grow in *C. elegans*, a small nematode. **Dr. Bruce Wightman**

H. What's in a Latte? Students will examine the effect of caffeine on neurotransmitter receptor signaling. These experiments will allow students to learn cell culture techniques, biochemical assays, and the use of fluorescent probes. **Dr. Jeremy Teissère**

