

# Brain and Cognitive Sciences

► Faculty and students within the Department of Brain and Cognitive Sciences (BCS) study how the brain works. They look at how we see and hear, move, learn and remember, and produce and understand language. Their work spans the small—looking at cells in the brain—to the large, ultimately understanding how cells communicate with one another to produce behavior.

BCS programs attract inquisitive, smart undergraduate and graduate students. They become problem solvers and critical thinkers who know how to evaluate data and draw conclusions. Some go to medical school, while others choose graduate school or enter the workforce.

## Out of the Lab, Into the World

BCS research is helping to improve the health and well-being of babies, kids, and adults, and it is driving new educational and medical therapies along the way.

## How We Make Decisions

BCS researchers study our perceived value of objects and ideas, the value of rewards, and restraint. By understanding how the brain makes decisions, new therapies can be developed to address obsessive-compulsive disorders, drug addiction, gambling habits, and much more.

## Adding It All Up

Researchers in Rochester's Kid NeuroLab study numerical cognition and have determined that a primitive math system exists in the brain—a precursor for understanding numerical computations—which helps predict future math IQ performance. This helps them identify potential learning issues and develop educational strategies.

## Brain Training

BCS researchers in the University's Center for Brain Imaging study stroke victims and those with brain damage to better understand dysfunctional parts of the brain and how to encourage the brain to think differently. This

helps patients overcome injury and helps neurosurgeons identify the safest ways to operate.

## More than a Game

The skills needed to play high-level games require our brains to work in advanced ways. BCS researchers have found that some video games can enhance perception, learning, and decision making. Video gaming research could drive the development of educational-oriented games that help close gaps for those with attention deficit disorders or who are on the autism spectrum.

## Music to the Ear

Researchers across BCS, the Eastman School of Music, and the University of Rochester Medical Center are looking at how studying music influences learning. Understanding the connections between music and language opens doors for creating therapies for those with speech processing issues and can even help develop new hearing aid technologies.



*“I thoroughly enjoy research and the challenge of trying to prove something. In BCS, we often work on problems with people from different academic perspectives. This collaborative approach not only informs the process, it generates new ideas and expands our thinking.”*

**Sam Weiller '13**

brain and cognitive sciences and music double major, Bilski-Mayer Fellow

## Points of Pride

### Accomplished Faculty

The BCS faculty and its research programs are a major intellectual force, with national and international reputations in several fields. Faculty members have received numerous honors from the National Academy of Science, the American Association for the Advancement of Science, and elsewhere. BCS has also attracted research funds from the National Institutes of Health and the National Science Foundation.

### Rankings

According to recent National Research Council rankings, the graduate program in brain and cognitive sciences at Rochester is ranked as high as fourth nationally among nearly 250 PhD programs in cognitive science and psychology.

### Undergraduate Achievement

The department prides itself on its hands-on approach to learning. Its undergraduates have many opportunities for research, leading them to publish papers and present at conferences. Many also become Take Five Scholars.

## How You Can Help

Help create academic and research opportunities for students and faculty and contribute to knowledge that will have a profound effect on human health and well-being. Consider any of the following giving opportunities:

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## Transformational Gifts

### The Beverly Petterson Bishop M '46 and Charles W. Bishop PhD '46 Endowed Professorship in Brain and Cognitive

**Sciences:** The Bishops created this professorship to support an outstanding scientist who researches cognitive brain functions and teaches undergraduate and graduate students. In 2008, BCS professor Michael Tanenhaus, an international authority on language production and comprehension, was installed as the first recipient.

**The Bilski-Mayer Fellows Program:** Melissa Bilski and Chris Mayer created an undergraduate fellowship program supporting summer research projects of BCS and neuroscience students. Since the program was established in 2009, 16 students have benefited from the program and have pursued research in numerical cognition, psycholinguistics, brain plasticity, visual perception, and more. This fellowship has become a model for other department-based undergraduate research opportunities.

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### Students

Supporting students is one of the highest priorities at Rochester. Establishing scholarships and fellowships helps undergraduate and graduate students achieve their academic potential while helping the department advance new knowledge. Other areas of need include undergraduate and graduate research grants, conference funds, and support for curriculum development.

### Faculty

Endowed professorships help to attract faculty of exceptional talent and are visible honors recognized across the University and by other top educational institutions. They also help the department target hires in specific areas, grow multidisciplinary partnerships across the University, and

specifically build opportunities with the Medical Center and the Eastman School of Music. Training funds and research grants are also needed for junior faculty.

### Programs

Federal funding is tighter than ever. A faculty member may have a new, ambitious idea but can't develop it without start-up funds to provide proof of concept to the National Institutes of Health and other federal funding sources. Grants of all sizes can help researchers gather evidence to support their work and pay for a graduate student or postdoctoral scholar to work on a project full time. Funds are also needed to help build out or renovate space within Meliora Hall.

Learn, Discover, Heal, Create—And Make the World Ever Better

[www.bcs.rochester.edu](http://www.bcs.rochester.edu)



For more information on giving opportunities, please contact  
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