



## GENOMICS OF NEURAL AND BEHAVIORAL PLASTICITY

### PROBLEM

How does the genome help orchestrate complex forms of behavior? There are two master control systems, the brain and the genome. The role of the brain in behavior is immediately obvious to most people, but the role of the genome is less so — or in some cases, even controversial (e.g., “nature vs. nurture”).

### RESEARCH

The Genomics of Neural and Behavioral Plasticity Research Theme will draw together a team of researchers from neuroscience, animal behavior, ecology and evolutionary biology, and physics to examine four interrelated domains of neuroscience, behavior, and genomic biology:

- how the nervous system responds to environmental stimuli, including social stimuli involved in auditory and olfactory communication
- how some types of stimuli are able to affect the genome by altering gene expression in the brain
- how changes in brain gene expression result in changes in brain and behavior
- how genetic diversity among species contributes to the diversity or conservation of behavioral responses to common environmental stimuli

The theme will address these issues by studying various “neurogenomic decision-making systems” in a diverse array of animals, both in the lab and in the field. Theoretical approaches from physics will be used to help search for deep generalizations.

### BENEFITS

By building synthesis across these systems, researchers hope to gain a fuller appreciation of how the genome and the brain control behavior. Findings in this area may have practical application in the development of medical therapeutics for mental health, aging, and developmental disorders.

### THEME LEADER

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### FACULTY

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