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Cornelia Bargmann and Gerald Rubin Share \$500,000 Gruber Neuroscience Prize for Pioneering Work in Circuitry of Behavior



Cornelia Bargmann



Gerald Rubin

May 8, 2024, New Haven, CT — The 2024 Gruber Neuroscience Prize is being awarded to Cornelia “Cori” Bargmann, PhD, of The Rockefeller University, and Gerald “Gerry” Rubin, PhD, of the Howard Hughes Medical Institute’s Janelia Research Campus for their pioneering work in elucidating the organization of circuits in behavior, and for their work in developing new genetics tools, which have advanced the entire field of neuroscience.

Their work, which was carried out in the model invertebrate organisms *Caenorhabditis elegans* and *Drosophila melanogaster*, has offered insight into the circuitry of behavior. Tool development has included P-elements, which offered a way to genetically modify flies; the sequencing of the *Drosophila* genome; and the mapping of the *Drosophila* connectome, which offered a map of the neurons in the fly brain, and the ways in which these neurons are connected.

Insights into the circuitry of behavior have included identifying the first odorant receptor, and connecting this receptor with the specific behavior of either being attracted to or repelled by the diacetyl odor, as well as experiments that have offered insight into the genetic basis of context-specific behaviors.

“The work performed by Bargmann and Rubin has advanced the field of neuroscience in multiple ways,” says Frances Jensen, Professor and Chair Department of Neurology, Perelman School of Medicine, University of Pennsylvania, and chair of the Selection Advisory Board to the Prize. “This includes the work they have done that has offered insight into the question of the link between biology and behavior, as well as their generosity in creating and sharing tools that have helped move the field forward, by offering new capabilities for carrying out research accessible to a wide range of institutions. Their impact on the field cannot be understated.”

The Gruber Neuroscience Prize, which includes a \$500,000 award, will be presented to Bargmann and Rubin on October 6 at the Annual Meeting of the Society for Neuroscience in Chicago.

Bargmann is being recognized for her role in linking genetics with behavior, which includes identifying the first odorant receptor, and linking this receptor to a specific innate behavior. These early discoveries were then followed up with experiments looking at the link between environmental cues, genetic variation, and flexible behaviors that have provided insights into the genetic basis of behavior.

Rubin is being recognized for his role in developing a number of tools and resources that have advanced the field of *Drosophila* neuroscience, including P-element mediated genetic engineering; leading the effort to sequence the *Drosophila* genome; and undertaking the massive venture of mapping the fly brain, which included identifying the constituent neurons and their connections to each other, all of which have enriched the field in a number of invaluable ways.

Additional Information

In addition to the cash award, the recipients will receive a gold laureate pin and a citation that reads:

*The Gruber Foundation proudly presents the 2024 Gruber Neuroscience Prize to Cornelia I. Bargmann and Gerald M. Rubin for their fundamental research and leadership in the use of the invertebrate genetic model organisms, *Caenorhabditis elegans* (Bargmann) and *Drosophila melanogaster* (Rubin) in neuroscience. Both investigators have done rigorous and important fundamental studies relevant to gene function and the organization of circuits in behavior. Both investigators have developed new genetic tools, methods, lines, and reagents, which are today used by the entire field. Thus, Bargmann and Rubin have facilitated, accelerated, and democratized scientific research, and have created vibrant international communities and educational opportunities using these genetic model invertebrates.*

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The Neuroscience Prize honors scientists for major discoveries that have advanced the understanding of the nervous system.

Laureates of the Gruber Neuroscience Prize:

- **2023: Huda Akil**, for contributions to identification of neural circuitry and molecular mechanisms that underlie neuropsychiatric conditions
- **2022: Larry Abbott, Emery Neal Brown, Terrence Sejnowski, and Haim Sompolinsky**, computational and theoretical neuroscience contributions
- **2021: Christine Petit and Christopher A. Walsh**, for elucidating the genetic and molecular mechanisms that underlie human neurodevelopmental hereditary disorders
- **2020: Friedrich Bonhoeffer, Corey Goodman, and Marc Tessier-Lavigne**, for elucidating developmental mechanisms that guide axons to their targets
- **2019: Joseph S. Takahashi**, for pioneering work on the molecular and genetic basis of circadian rhythms in mammals

- **2018: Ann M. Graybiel, Okihide Hikosaka and Wolfram Schultz**, for pioneering work in the study of the structure, organization and functions of the basal ganglia
- **2017: Joshua Sanes**, for groundbreaking discoveries about synapses, transforming our understanding of how the human brain functions
- **2016: Mu-Ming Poo**, for pioneering and inspiring work on synaptic plasticity
- **2015: Carla Shatz and Michael Greenberg**, for elucidation of the molecular mechanisms through which neural activity controls wiring and plasticity of the brain
- **2014: Thomas Jessell**, for pioneering work on the differentiation of spinal cord neurons and their wiring into networks
- **2013: Eve Marder**, for contributions to understanding how circuit dynamics and behavior arise from the properties of component neurons and their synaptic connections
- **2012: Lily and Yuh Nung Jan**, for fundamental contributions to molecular neurobiology
- **2011: Huda Y. Zoghbi**, for pioneering work on revealing the genetic underpinnings of neurological disorders
- **2010: Robert H. Wurtz**, for pioneering work on neural bases of visual processing in primates
- **2009: Jeffrey C. Hall, Michael Rosbash, and Michael Young**, for revealing the gene-driven mechanism that controls rhythm in the nervous system
- **2008: John O'Keefe**, for discovering place cells, which led to important findings in cognitive neuroscience
- **2007: Shigetada Nakanishi**, for pioneering research into communication between nerve cells in the brain
- **2006: Masao Ito and Roger Nicoll**, for work on the molecular and cellular bases of memory and learning
- **2005: Masakazu Konishi and Eric Knudsen**, for work on the neural basis of sound localization
- **2004: Seymour Benzer**, for applying the tools of molecular biology and genetics to the fruit fly, *Drosophila*, and linking individual genes to their behavioral phenotypes

The Society for Neuroscience partners with the Foundation on the Prize and nominates the members of the Selection Advisory Board that chooses the Prize recipients. Its members are:

Joanne Berger-Sweeney, Trinity College; **Frances Jensen**, University of Pennsylvania (Chair); **Pierre Magistretti**, King Abdullah University of Science and Technology; **Eve Marder**, Brandeis University; **John H.R. Maunsell**, The University of Chicago; **Ikue Mori**, Nagoya University; **Christine Petit**, Collège de France and the Institut Pasteur.

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The Gruber International Prize Program honors individuals in the fields of Cosmology, Genetics and Neuroscience, whose groundbreaking work provides new models that inspire and enable fundamental shifts in knowledge and culture. The Selection Advisory Boards choose individuals whose contributions in their respective fields advance our knowledge and potentially have a profound impact on our lives.

The Gruber Foundation was established in 1993 by the late Peter Gruber and his wife Patricia Gruber. The Foundation began its International Prize Program in 2000, with the inaugural Cosmology Prize.

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For more information on the Gruber Prizes, visit www.gruber.yale.edu, e-mail info@gruber.yale.edu or contact A. Sarah Hreha at +1 (203) 432-6231. By mail: The Gruber Foundation, Yale University, Office of International Affairs, PO Box 208320, New Haven, CT 06520.

Media materials and additional background information on the Gruber Prizes are in our online newsroom: www.gruber.yale.edu/news-media

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