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Neuroscientists Christine Petit and Christopher A. Walsh Share $500,000 Gruber Neuroscience Prize for Pioneering Discoveries Regarding the Genetic and Molecular Mechanisms Behind Neurodevelopmental Hereditary Disorders

Christine Petit

Christopher A. Walsh

May 5, 2021, New Haven, CT – The 2021 Gruber Neuroscience Prize is being awarded to neuroscientists Christine Petit, MD, PhD, of Institut Pasteur and Collège de France, and Christopher A. Walsh, MD, PhD, of Harvard Medical School, Boston Children's Hospital and the Howard Hughes Medical Institute, for their groundbreaking work in revealing the genetic and molecular mechanisms behind the development of inherited neurodevelopmental disorders. Petit is receiving the award for her seminal contributions to the understanding of the mechanisms involved with hearing and hearing loss. Walsh is receiving the award for his novel and fundamental insights into the development of the cerebral cortex and genetic brain disorders, including inherited forms of epilepsy and autism spectrum disorder.

The Gruber Neuroscience Prize, which includes a $500,000 award, will be presented to Petit and Walsh in November at the annual meeting of the Society for Neuroscience.

"These remarkable scientists have had a profound impact on our understanding of how the brain functions, both in health and disease," says Frances Jensen, Professor and Chair Department of Neurology, Co-Director Penn Medicine Translational Neuroscience Center, Perelman School of Medicine, University of Pennsylvania, and chair of the Selection Advisory Board to the Prize. "Their research has also led to the development of exciting and promising new genetic therapies for neurodevelopmental disorders."

While working separately in the 1990s, Petit and Walsh pioneered an innovative approach to identifying the genes responsible for hereditary hearing loss and disorders of the cerebral cortex: They studied the genomes of geographically isolated consanguineous families with multi-generational histories of such conditions. Then, using animal models and laboratory

techniques created in their own laboratories, they went on to describe how the expression of these genes affect either the brain's processing of sound or the development of the cerebral cortex.

"Drs. Petit and Walsh's visionary genetic studies of inherited brain disorders have illuminated how the human brain develops," says Carla Shatz, the Sapp Family Provostial Professor of Neurobiology and Biology and the Catherine Holman Johnson Director of Stanford Bio-X and member of the Selection Advisory Board to the Prize. "It is wonderful to recognize their contributions with this prestigious award."

Additional Information

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

The Gruber Foundation proudly presents the 2021 Neuroscience Prize to Christine Petit and Christopher A. Walsh for their use of genetic and molecular methods to elucidate fundamental mechanisms underlying hereditary diseases of the human nervous system. Their innovative and pioneering use of consanguineous families led to the identification of numerous genes mutated in disorders of hearing loss and cerebral cortical development. These discoveries were then dissected at the mechanistic level in model organisms, leading to new understanding of how the cochlea functions and how the cerebral cortex forms.

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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:

- **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 his pioneering and inspiring work on synaptic plasticity
- **2015: Carla Shatz and Michael Greenberg,** for their elucidation of the molecular mechanisms through which neural activity controls wiring and plasticity of the brain
- **2014: Thomas Jessell,** for his pioneering work on the differentiation of spinal cord neurons and their wiring into networks
- **2013: Eve Marder,** for her 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 their fundamental contributions to molecular neurobiology
- **2011: Huda Y. Zoghbi,** for her 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:

Frances Jensen, University of Pennsylvania (Chair); **Pierre Magistretti**, King Abdullah University of Science and Technology; **Eric Nestler**, Icahn School of Medicine at Mount Sinai; **Anthony Phillips,** University of British Columbia; **Angela Roberts,** University of Cambridge; **Joshua Sanes,** Harvard University; and **Carla Shatz**, Stanford University.

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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 Development, PO Box 2038, New Haven, CT 06521.

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