

# Pioneering work on molecular mechanisms of brain development and plasticity awarded with the world's top prize in neuroscience – The Brain Prize 2023

PRESS RELEASE

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Professors Michael Greenberg, Christine Holt and Erin Schuman have revolutionized our understanding of how neurons regulate the thousands of different proteins – the building blocks of life, that are needed to support brain development, plasticity and maintenance. They have revealed crucial molecular mechanisms that sustain the development and function of the healthy brain and also provided key insights into the causes of neurodevelopmental and neurodegenerative diseases.

Copenhagen, Denmark - The Lundbeck Foundation has announced the recipients of The Brain Prize 2023, the world's largest award for outstanding contributions to neuroscience. This year's award recognizes the pioneering work of three leading neuroscientists - Professor Michael Greenberg at Harvard Medical School, Professor Christine Holt at University of Cambridge, and Professor Erin Schuman at the Max Planck Institute for Brain Research.

The Brain Prize 2023 worth DKK 10 million (€1.3 million) is awarded to: Michael Greenberg (USA), Christine Holt (UK) & Erin Schuman (Germany)

A profound aspect of our nervous system is that during development and adulthood our brains are subject to extensive change, known as neural plasticity. Such plasticity requires that the complement of neural proteins - the neural proteome, be dynamically regulated in space and time. An international group of three neuroscientists, Michael Greenberg, Christine Holt, and Erin Schuman have each revealed the fundamental principles of how this is mediated at the molecular level – from activity-dependent gene transcription to the local translation of mRNA into new proteins in dendrites and growing axons.

Their findings have provided spectacular new insights into the cellular and molecular mechanisms that guide growing axons during brain development, and that enable the developing and adult brain to be shaped by experience. Theirs is a beautiful discovery story in fundamental neuroscience that also provides clues to the aetiology of neurodevelopmental and neurodegenerative diseases of the brain. For their work, the three neuroscientists are awarded the world's largest prize for brain research – The Brain Prize.

Professor Richard Morris, Chair of The Brain Prize Selection Committee explains the reasoning behind this year's award.

*“In order to establish appropriate neural connections during development or to adapt to new challenges in adulthood through learning and memory, brain circuits must be remodeled, and the new patterns of connectivity maintained; processes that require the synthesis of new proteins for those connections. The Brain Prize winners of 2023, Michael*

*Greenberg, Christine Holt, and Erin Schuman have revealed the fundamental principles of how this enigmatic feature of brain function is mediated at the molecular level. Together, the Brain Prize 2023 winners have made ground-breaking discoveries by showing how the synthesis of new proteins is triggered in different neuronal compartments, thereby guiding brain development and plasticity in ways that impact our behavior for a lifetime.”*

*“On behalf of the Lundbeck Foundation, I am delighted that The Brain Prize 2023 is awarded to these three outstanding neurobiologists,” said Lene Skole, CEO of the Lundbeck Foundation.*

*“Their pioneering research has broken new ground and provided deep insights into the molecular mechanisms of neural development and plasticity. Their work also provides vital new insights into the causes and mechanisms of some of the most devastating disorders of the brain. The awarding of this year’s Brain Prize is thoroughly well-deserved.”*

Find out more – see the information pack of The Brain Prize 2023:  
[www.thebrainprize.com](http://www.thebrainprize.com)

## About the Brain Prize

The Brain Prize is the world’s largest neuroscience research prize, and it is awarded each year by the Lundbeck Foundation. The Brain Prize recognises highly original and influential advances in any area of brain research, from basic neuroscience to applied clinical research. Recipients of The Brain Prize may be of any nationality and work in any country in the world. Since it was first awarded in 2011 The Brain Prize has been awarded to 44 scientists from 9 different countries.

Brain Prize recipients are presented with their award by His Royal Highness, The Crown Prince of Denmark, at a ceremony in the Danish capital, Copenhagen.

## About the Lundbeck Foundation

The Lundbeck Foundation is an enterprise foundation encompassing a comprehensive range of commercial and philanthropic activities – all united by its strong purpose; Bringing Discoveries to Lives. The Foundation is the long-term and engaged owner of several international healthcare companies – Lundbeck, Falck, ALK, and Ferrosan Medical Devices – and an active investor in business, science and people through its commercial investments in the financial markets; in biotech companies based on Danish research and through philanthropic grants to science talents and programmes in Danish universities. The Foundation’s philanthropic grants amount to more than DKK 500m annually primarily focusing on the brain – including the world’s largest personal prize awarded in neuroscience, The Brain Prize.

## Press contact:

For media enquiries and more information please contact:

Jesper Sloth Møller | Head of Media Relations | Lundbeck Foundation  
[jsm@lundbeckfonden.com](mailto:jsm@lundbeckfonden.com) | +45 2233 8601

Martin Meyer | Director of the Brain Prize | Lundbeck Foundation  
[mm@lundbeckfonden.com](mailto:mm@lundbeckfonden.com)