Science &
SciLifeLab

PRIZE

For Young Scientists

2025

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About the Prize

The *Science* & SciLifeLab Prize for Young Scientists is aimed at young scientists at the very start of their careers. The categories for this year's prize are: Cell and Molecular Biology; Genomics, Proteomics and Systems Biology Approaches; Ecology and Environment; and Molecular Medicine.

Each of the candidates submitted a thousand-word essay describing their PhD thesis work. The essays were judged by an independent editorial team organized by *Science*, the world's leading outlet for scientific news, commentary, and cutting-edge research.

The total prize money of USD 60,000 recognizes the brightest and the best new ideas in science. The grand prize-winning essay has recently been published in an issue of the journal *Science* and the essays of the three category winners have been published in *Science* online.

Shaping the Future of Science: Celebrating Young Researchers

"The *Science* & SciLifeLab Prize for Young Scientists not only honors exceptional talent, but also underscores the importance of curiosity and the pursuit of new knowledge in driving ground breaking discoveries.

Paired with their ability to communicate new concepts with clarity and enthusiasm, these young researchers give inspiring examples of how progress in science is rooted in a commitment to venture into the unknown by generating new facts, use logical reasoning and collaborate.

We are proud to support them as they take the next steps in their careers, and we look forward to seeing how their work will develop and inspire future generations".

– Jan Ellenberg, SciLifeLab Director

Grand Prize winner

Uche Medoh

Category: Molecular Medicine

Essay title: *The missing piece – solving the 50-year puzzle of BMP synthesis in neurodegeneration*

Biography

Uche Medoh received an undergraduate degree from Yale University and conducted his PhD and postdoctoral research at Stanford University. He started his laboratory at the Arc Institute in 2024, where his research focuses on discovering and characterizing protein-metabolite interactions that can be leveraged to modulate aging and age-related diseases.

Abstract

Neurodegenerative diseases often result from lysosomal dysfunction, where cells fail to properly degrade lipids. The lysosomal lipid bis(monoacylglycero)phosphate (BMP) promotes this breakdown and prevents toxic lipid accumulation, but how BMP is made has been unknown for over half a century. I identified that CLN5—a gene mutated in Batten disease—encodes the long-sought BMP synthase. Through lipidomic, biochemical, and cellular analyses, I demonstrated that CLN5 catalyzes the condensation of two lysophosphatidylglycerol molecules to generate BMP within lysosomes, revealing an unexpected biosynthetic capacity of lysosomes. Furthermore, I found that CLN5 deficiency causes severe BMP depletion, lipid accumulation, and neuronal dysfunction characteristic of Batten disease. My work opens therapeutic avenues for restoring BMP levels to treat Batten disease and potentially other neurodegenerative disorders linked to lysosomal dysfunction.

Category winner

Liam Lachs

Category: Ecology & Environment

Essay title: *Balancing between evolutionary rescue and extinction – the adaptive potential of reef-building corals in a warming world*

Biography

Liam Lachs received an undergraduate degree from the University of Galway, a master's from Vrije Universiteit Brussel, and a PhD from Newcastle University. Since helping to conceptualize the CORALADAPT project, Liam is now a postdoctoral research fellow in the Marine Spatial Ecology Lab at the University of Queensland. His research focuses on how coral reef management can leverage spatial variations in heat wave exposure and the adaptive potential of corals to support reefs in a warming world.

Abstract

Marine heatwaves are causing unprecedented declines across the world's coral reefs. Losses owing to mass coral bleaching and mortality events have been particularly severe for fast-growing yet heat-sensitive corals such as many Acropora species. It remains uncertain whether such corals may undergo evolutionary rescue or are facing an extinction vortex. I addressed this knowledge gap using a combination of field and lab experiments, historic environmental and ecological data, and evolutionary metapopulation modelling of corymbose Acropora corals in Palau. Together, this work uncovers new insights into the adaptive capacity of corals, suggesting that reefs may already be adjusting to ocean warming. Both rapid emissions reductions and strategic reef management will be essential to maintain conditions in which evolution can help corals persist in our warming world.

Category winner

Nitzan Tal

Category: Genomics, Proteomics & Systems Biology

Essay title: *Nucleotides on the frontline – nucleotide-centric defense systems reveal a core principle in bacterial antiviral immunity*

Biography

Nitzan Tal received an undergraduate degree from the Hebrew University of Jerusalem and a PhD from Weizmann Institute of Science. She is currently a postdoctoral fellow at the European Molecular Biology Laboratory (EMBL Heidelberg), where she explores how bacteria respond to threats in their environment.

Abstract

Viruses that infect bacteria, known as phages, are major drivers of microbial evolution. Bacteria have evolved diverse molecular defenses, yet the underlying principles of how they combat viral infection are still emerging. This work explores how bacteria use their own nucleotide metabolism as a weapon against phages. Through a combination of genomic mining, biochemical characterization, and structural analysis, multiple bacterial defense systems were uncovered that manipulate or corrupt cellular nucleotides to block phage replication. These include enzymes that deplete essential nucleotides, produce cyclic nucleotide signals, or convert canonical bases into potentially toxic forms. Together, these findings reveal that targeting free nucleotides is a central strategy in bacterial immunity, shedding light on a hidden layer of defense and offering new insights into microbial survival tactics.

Category winner

King Hung

Category: Cell & Molecular Biology

Essay title: *Oncogenes out of context – cancer genes break free from the regulatory constraints of chromosomes*

Biography

King L. Hung received an undergraduate degree from the University of Washington and a PhD from Stanford University. He started his postdoctoral fellowship at Scripps Research Institute in September 2024. His research focuses on the basic principles of how cells dynamically regulate genomic and signaling processes in cancer and tissue homeostasis.

Abstract

Genes that promote cell growth are often amplified in cancer via increased DNA copy numbers outside chromosomes, driving tumor formation. How this extrachromosomal DNA is regulated and inherited by dividing cancer cells was poorly understood. We used fluorescence imaging, genomics and computational modeling to study the DNA sequences, physical interactions, and activities of extrachromosomal DNA in cancer cells. We found that these extrachromosomal DNA molecules dynamically rearrange in sequence, physically activate one another in space and are inherited together by dividing cancer cells. These properties defy the normal constraints of chromosomes and allow cancer cells to become hyperactive. Studying the dynamic DNA of cancer will ultimately help us understand how cancer cells grow and evolve, and design better treatments to target them.

Scientific symposium 2025

December 11, Auditorium Stockholm, Grand Hôtel

Program

Moderators: Mariana Braga, DDLS Fellow at Swedish University of Agricultural Sciences & Simon Koplev, SciLifeLab Fellow at KTH Royal Institute of Technology

12:30 *Coffee and registration*

13:00 **Welcoming words**
Jan Ellenberg, Director of SciLifeLab

13:15 **Keynote lecture: Neurotransmission under the electron microscope**
Andrija Sente, Grand Prize Winner 2024

13:45 **Nucleotides on the frontline – nucleotide-centric defense systems reveal a core principle in bacterial antiviral immunity**
Nitzan Tal, Category winner, Genomics, Proteomics & Systems Biology

14:05 *Coffee break*

14:40 **Balancing between evolutionary rescue and extinction – the adaptive potential of reef-building corals in a warming world**
Liam Lachs, Category winner, Ecology & Environment

15:00 **The missing piece – solving the 50-year puzzle of BMP synthesis in neurodegeneration**
Uche Medoh, Grand Prize winner, Molecular medicine

15:20 **Interview with the winners**

15:45 **Closing words**
Mia Phillipson, Co-Director of SciLifeLab

15:55 *Mingle and refreshments*

Organizers

SciLifeLab

SciLifeLab is a national research infrastructure, dedicated to the advancement of life sciences and providing access to cutting-edge technologies and scientific expertise.

SciLifeLab's capabilities combine technological expertise from our infrastructures with a focus on pandemic laboratory preparedness; precision medicine; and planetary biology. The infrastructure and data resources are developed and supported by a closely intertwined research community. These facilities are leveraged by thousands of researchers every year, providing the tools to become internationally competitive and enable groundbreaking research otherwise not possible. Life science is data-dependent and the amount and complexity of data is increasing. The SciLifeLab & Wallenberg National Program for Data-Driven Life Science (DDLS) is one step to meet these challenges.

SciLifeLab fosters collaborations with industry; health care; public research organizations and international partners, recruits and trains the next generation of young scientists and plays an important role as the first line of defence against current and future pandemics.

Founded by four universities: Karolinska Institutet, KTH Royal Institute of Technology, Stockholm University, and Uppsala University, SciLifeLab began its journey in 2010. Today, SciLifeLab is a national resource supporting research at all major Swedish universities.

The AAAS and the *Science* family of journals

The AAAS and the Science family of journals The American Association for the Advancement of Science (AAAS) is the world's largest general scientific society and publisher of the journal Science (www.sciencemag.org) as well as Science Translational Medicine, Science Signaling, a digital, open-access journal, Science Advances, Science Immunology, and Science Robotics.

AAAS was founded in 1848 and includes nearly 250 affiliated societies and academies of science, serving 10 million individuals. Science has the largest paid circulation of any peer-reviewed general science journal in the world. The non-profit AAAS (aaas.org) is open to all and fulfills its mission to "advance science and serve society" through initiatives in science policy, international programs, science education, public engagement, and more.

Knut and Alice Wallenberg Foundation

The Knut and Alice Wallenberg Foundation is the largest private financier of research in Sweden and also one of Europe's largest. The Foundation primarily grants funding in natural sciences, technology and medicine. During the past five years the Foundation has granted a total of over SEK 9 billion for various projects, mainly at Swedish universities.

Thank you

We would like to say a special thank you to the independent scientific panel of judges for this year's prize. We would like to acknowledge the judges for their time, expertise and efforts in identifying this year's prize-winners.

- Dr. Kate Fitzgerald of UMass Chan Medical School
- Dr. Ian Boyd of University of St. Andrews
- Dr. Chelsea Wood of University of Washington
- Dr. Valda Vinson of Science
- Dr. Ruixue Wan of Westlake University, China
- Dr. Jay Shedure of University of Washington
- Dr. Jason Tylianakis of University of Canterbury, New Zealand
- Dr. Scott Edwards of Harvard University
- Dr. Toren Finkel of University of Pittsburgh
- Dr. Longzhi Tan of Stanford University
- Dr. Melike Lakadamyali of Penn State University
- Dr. Jonathan Kipnis of Washington University in St. Louis


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