

# MOLECULAR FRONTIERS SYMPOSIUM IN HONG KONG

DATE

**15-17.11.2024**

VENUE

SHAW AUDITORIUM,  
THE HONG KONG UNIVERSITY OF  
SCIENCE AND TECHNOLOGY

ORGANIZERS



HOST



CO-HOST







# ABOUT US

## Organizers:



## Host:



## Co-Host:



## Molecular Frontiers Symposium in Hong Kong

The globally renowned Molecular Frontiers Foundation will hold the historic international scientific conference, the **Molecular Frontiers Symposium** in Hong Kong on Friday– Sunday, November 15-17, 2024.

The Molecular Frontiers Foundation is one of the most influential scientific organizations in the world, bringing together numerous Nobel Prize laureates and top molecular scientists from around the globe. The Molecular Frontiers Symposium aims to advance cutting-edge molecular science research and facilitate interaction between leading scientists and the general public. Traditionally held in Europe, America, and certain Asian countries including Japan, Singapore and South Korea, the 2024 symposium will be held in Hong Kong for the first time in the organization's history at The Hong Kong University of Science and Technology. The theme of the symposium is "**Frontiers of New Knowledge in Science**" and it gathers close to forty world-class scientists, including four Nobel Prize laureates. Hundreds of students from high schools and junior high schools in Hong Kong will be invited to participate in the symposium, to stimulate and spark their interests in science, technology, and artificial intelligence.

The symposium will be a significant milestone in the history of Hong Kong's scientific and technological innovation, positively enhancing the city's international impact on science and technology and showcasing its leading position in scientific research and high-tech innovation. It will promote academic exchanges between Hong Kong's scientific community and world-class scientists and attract global innovation resources and talent to Hong Kong. It will also inspire young local students' enthusiasm to pursue scientific research and innovation technology industry, conducive to cultivating talent in technological innovation.

With active coordination and sponsorship from Ausvic Capital Limited, the Government of Hong Kong Special Administrative Region intends to give strong support to the event in Hong Kong.



# Program



**FRIDAY**  
**15 NOVEMBER**

08:00 - 09:00	<b>Registration</b>
09:00 - 09:10	<b>Opening Remarks</b>  Nancy Y. Ip President, The Hong Kong University of Science and Technology Hong Kong  Bengt Nordén Founding Chairman, Molecular Frontiers Foundation The Royal Swedish Academy of Sciences Gothenburg, Sweden  Zhang Shuguang Board Member, Molecular Frontiers Foundation MIT Media Lab Cambridge, MA, USA  <b>Session Chair:</b> Karin Markides Chair Chairman, Molecular Frontiers Foundation
09:10 - 09:50	<b>The Thrill of Antibodies and Their Applications</b>  Greg Winter University of Cambridge Cambridge, UK
09:50 - 10:30	<b>From covalent transition states in chemistry to noncovalent in biology: from Brønsted <math>\beta</math>- to <math>\Phi</math>-value analysis</b>  Alan Fersht University of Cambridge Cambridge, UK
10:30 - 10:50	<b>Tea Break</b>
10:50 - 11:30	<b>Protein Folding is the Basis of Life and Death</b>  Pernilla Wittung-Stafshede Chalmers University of Technology Gothenburg, Sweden
11:30 - 12:10	<b>De Novo Protein Design</b>  William DeGrado University of California, San Francisco CA, USA
12:10 - 13:30	<b>Lunch on Campus</b>





**Session Chair:** Lorie Karnath  
Chair  
President, Molecular Frontiers Foundation

13:30 - 14:10 **Molecular Resolution and Dynamics in Fluorescence Microscopy**

Stefan Hell  
Max Planck Institute  
Gottingen, Germany

14:10 - 14:50 **Snail Coiling: CRISPR Editing of A Single Gene Turns Righties Into Lefties**

Reiko Kuroda  
Chubu University  
Kasugai, Japan

14:50 - 15:30 **Advances in Genome Editing for Human Health**

Zhang Feng  
Broad Institute & MIT  
Cambridge, MA, USA

15:30 - 15:50 **Tea Break**

15:50 - 16:30 **Recent Excitement in Designer Materials and Sustained Release**

Robert Langer  
MIT  
Cambridge, MA, USA

16:30 - 17:10 **The Opioid Crisis and How to Overcome It**

Josiah "Jody" Rich  
Brown University  
Providence, RI, USA

17:10 - 18:30 **Panel Discussions and Questions from Students**

19:00 - 21:00 **Reception and Banquet (SPECIAL INVITATION ONLY)**

21:00 - 21:40 **After-Dinner Speech**

**Session Chair:** Mikael Akke  
Molecular Frontiers Foundation & Lund University  
Lund, Sweden

**The History of the Nobel Prizes**

Erling Norrby  
The Royal Swedish Academy of Sciences  
Stockholm, Sweden



# Program

**SATURDAY**  
**16 NOVEMBER**

08:00 - 09:00	<b>Registration</b>
09:00 - 09:10	<b>Opening Remarks</b>  Karin Markides Chairman, Molecular Frontiers Foundation
<b>Session Chair:</b>	Lorie Karnath Chair President, Molecular Frontiers Foundation
09:10 - 09:50	<b>Lessons from a Life in Science</b>  Tim Hunt The Francis Crick Institute London, UK
09:50 - 10:30	<b>Induced Fit? Studying Protein–Ligand Binding by NMR Relaxation Dispersion</b>  Mikael Akke Molecular Frontiers Foundation & Lund University Lund, Sweden
10:30 - 10:50	<b>Tea Break</b>
10:50 - 11:30	<b>Structures of Nucleosome and Telomerase</b>  Daniela Rhodes MRC- Laboratory of Molecular Biology Cambridge, UK
11:30 - 12:10	<b>What Can We Learn from a Million Human Genomes?</b>  Yang Huanming Founder & Chairman, BGI and Chinese Academy of Sciences Shenzhen, China
12:10 - 13:30	<b>Lunch on Campus</b>
<b>Session Chair:</b>	Bengt Nordén Founding Chairman, Molecular Frontiers Foundation The Royal Swedish Academy of Sciences Gothenburg, Sweden
13:30 - 14:10	<b>The Click Chemistry</b> K. Barry Sharpless The Scripps Research Institute La Jolla, CA, USA





- 14:10 - 14:50      **Making Single Handed Molecules Far from Equilibrium**
- Christina Moberg  
KTH Royal Institute of Technology  
Stockholm, Sweden
- 14:50 - 15:30      **How Life Works**
- Philip Ball  
Science Author  
London, UK
- 15:30 - 15:50      **Tea Break**
- 15:50 - 16:30      **Metabolic Engineering**
- Jens Nielsen  
BioInnovation Institute  
Copenhagen, Denmark
- 16:30 - 17:10      **Understanding and Combating Alzheimer Disease**
- Nancy Y. Ip  
President, The Hong Kong University of Science and Technology  
Hong Kong
- 17:10 - 18:30      **Panel Discussions and Questions from Students**
- 19:00 - 21:00      **Reception and Banquet (SPECIAL INVITATION ONLY)**
- 21:00 - 21:40      **After-Dinner Speech**
- Session Chair:**      Mikael Akke  
Molecular Frontiers Foundation & Lund University  
Lund, Sweden
- Climate Change and How to Mitigate It**
- Bengt Nordén  
Founding Chairman, Molecular Frontiers Foundation  
The Royal Swedish Academy of Sciences  
Gothenburg, Sweden





# Program

**SUNDAY**  
**17 NOVEMBER**

08:00 - 09:00	<b>Registration</b>
09:00 - 09:10	<b>Opening Remarks</b>  Lorie Karnath President Molecular Frontiers Foundation  Magdalena Eriksson Molecular Frontiers Foundation Gothenburg, Sweden
<b>Session Chair:</b>	Astrid Gräslund Stockholm University and The Royal Swedish Academy of Sciences Stockholm, Sweden
09:10 - 09:50	<b>The QTY Code, Always Ask Unusual Questions</b>  Zhang Shuguang MIT Media Lab Cambridge, MA, USA
09:50 - 10:30	<b>The Practice of the Change</b>  Joi Ito President, Chiba Institute of Technology Narashino, Japan
10:30 - 10:50	<b>Tea Break</b>
10:50 - 11:30	<b>Human Microbiome: Our Second Genome</b>  Zhao Bowen Founder & CEO, Quantihealth Beijing, China
11:30 - 12:10	<b>Panel Discussions and Questions from Students</b>
12:10 - 13:50	<b>Lunch on Campus</b>
<b>Session Chair:</b>	Zhang Shuguang MIT Media Lab Cambridge, MA, USA
14:00 - 14:40	<b>Designer Chiral Self-assembling Peptides for Medical Applications and Beyond</b>  Luo Zhongli Chongqing Medical University Chongqing, China







14:40 - 15:30	<b>Announcement of 2024 Winners of Molecular Frontiers Inquiry Prizes</b>  Per Thorén and Magdalena Eriksson Education Board and Editorial Board Molecular Frontiers Foundation Gothenburg, Sweden
15:30 - 16:00	<b>Presentation of Souvenirs by HKUST</b>
16:00 - 16:30	<b>A Few Farewell Words</b>  Bengt Nordén Nancy Y. Ip Pernilla Wittung-Stafshede Karin Markides Luo Zhongli Zhang Shuguang
16:30	<b>Symposium Adjourns</b>
18:00 - 21:00	<b>Reception and Banquet (SPECIAL INVITATION ONLY)</b>
21:00 - 21:40	<b>After-Dinner Speech</b>
<b>Session Chair:</b>	Zhang Shuguang MIT Media Lab Cambridge, MA, USA





# *Acknowledgement*

We would like to express our sincere gratitude to the following individuals and organizations for their support and contributions:

People from Ausvic Capital:

- Chen Ping
- Chrank Chen Taiheng
- Alan Li Ka Lun
- Ray Li Zhixi
- Savannah Xian Zhiping
- Lareina Lin Zhiqiu

The following units from The Hong Kong University of Science and Technology (HKUST):

- Global Engagement and Communications Office
- HKUST Jockey Club Institute for Advanced Study
- Media Technology and Publishing Center
- Office of the President
- Office of the Vice-President for Institutional Advancement
- School of Engineering
- School of Science
- Shaw Auditorium Unit

Their generous support and valuable contributions have been instrumental to the success of this symposium. We extend our deepest appreciation to all of them.





## *Brief bio and abstracts of speakers*

### **Mikael Akke, Ph.D.**

Department of Chemistry,  
Lund University, Lund, Sweden

<https://www.molecularfrontiers.org/people/223>

<https://www.cmps.lu.se/bpc/research/akke/>

<https://www.kva.se/en/contact/mikael-akke-2/>



Mikael Akke obtained his PhD in Physical Chemistry from Lund University, Sweden, with Sture Forsén as his thesis advisor. His thesis was based on protein NMR research conducted at The Scripps Research Institute, La Jolla, with Walter J. Chazin as project advisor during 1988–1993. Mikael then pursued postdoctoral research with Arthur G. Palmer III at Columbia University, New York, where he focused on developing NMR relaxation methods to study protein dynamics. In 1997, he was awarded status as Senior Researcher by the Swedish Research Council and returned to Lund University to head the protein NMR laboratory. In 2005 he was promoted to full Professor in Physical Chemistry at Lund University, and in 2006 he was elected Professeur Invité, Department of Chemistry, École Normale Supérieure, Paris, on the recommendation of Professor Geoffrey Bodenhausen. Since 2019, he is also Affiliated Professor at the Department of Biology, University of Copenhagen, Denmark. In 2013, he was elected to be a member of Class for Chemistry, the Royal Swedish Academy of Sciences, class for Chemistry, where he now serves as vice chairman. Mikael is currently the assistant head of the Department of Chemistry, Lund University, who has many faculty leadership roles there. Prior to that, he was the chairman of the board of the Swedish NMR Center hosted by the University of Gothenburg.

At present, he is heading two research projects funded by the Knut and Alice Wallenberg Foundation and the European Research Council. The first aims at understanding fundamental aspects of the dynamics and energetics of allosteric signaling within proteins, while the other focuses on the dynamics of protein–ligand binding.





## **Piero Baglioni, Ph.D.**

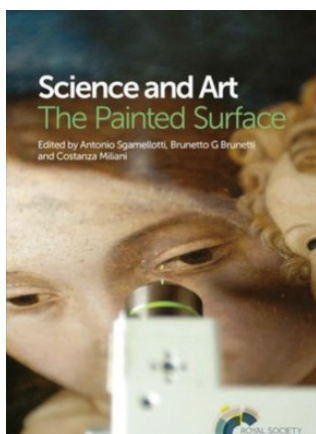
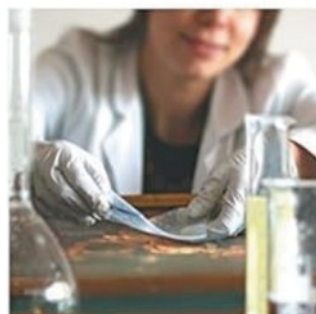
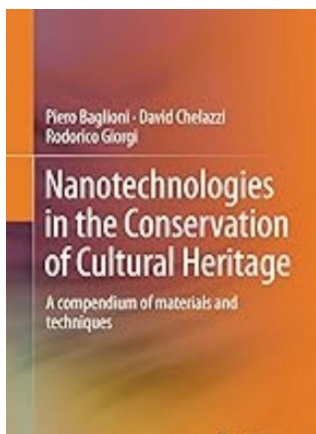
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Prof. Piero Baglioni is a physical chemist working in the field of soft matter physics and chemistry. Many of his studies are devoted to the application of scattering methodologies to several unexplored areas as: 1) cement hydration; 2) phospholipo-nucleosides; 3) water dynamics in several systems as proteins, cement, DNA, and RNA. From the beginning of his scientific career, he contributed to the application of Colloid and Material Science to the conservators of Cultural Heritage. He pioneered modern Conservation Science, generating new materials and methods that are nowadays available and employed worldwide by Conservators. In particular, using scattering techniques to tailor the properties of nanoparticles and soft matter systems he developed methods for mural paintings consolidation, paper and canvas conservation, polymers removal from artefacts, waterlogged wood deacidification, oil and easel paintings cleaning with innovative hydro- and organogels. He published over 570 scientific papers. He is also an expert consultant for ancient art conservation in museums around the world.

Prof. Piero Baglioni is a member of Scientific Advisory Board of Molecular Foundation. He has received many accolades for his scientific achievements, including: the Lectureship Award of the Division of Colloid and Surface Chemistry, The Chemical Society of Japan; Overbeek Prize; Medaglia Bonino; Catedra de Fisica, University of San Luis Potosi, Mexico; Lifetime Achievement for Contribution to Colloids and Interface Science; Caballero Aguila (One of the most prestigious recognitions from National Agency for Conservation of Mexico) ; European Gran Prix for Innovation Award; Rhodia (Solway) European Colloids and Interface Society award. He is a member of several national and international academies and societies and advisor or editor of several international journals.





## Philip Ball, Ph.D.

Science writer, London, UK

<https://philipball.co.uk/biography/>

<https://philipball.co.uk/books/>

<https://molecularfrontiers.org/people/156>



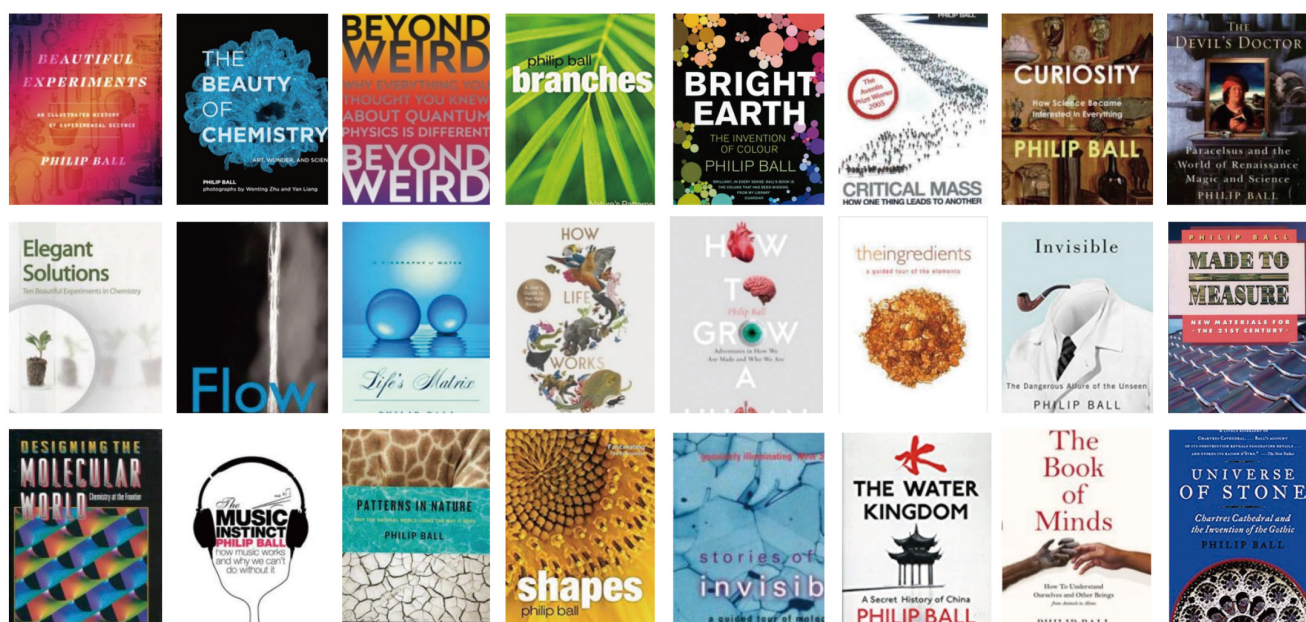
### How Life Works: The New Biology

Over the past several decades, biology has been undergoing a quiet revolution. As the molecular mechanisms in between the notion of an organism's "genetic blueprint" and the organism itself have come ever more into focus, it has become increasingly clear that the blueprint metaphor is the wrong one anyway. We are not mere readouts of some genetically encoded instructions. Rather, every level of the biological hierarchy, from genes to proteins to cells and tissues, has its own set of operational rules, and there is a constant flow of information between all the levels. In this talk I will discuss this new view of life, which appears to be more dynamic, adaptive, and innovative than the old view of a DNA-based program implies. It embraces the idea that the agency of living organisms is what truly distinguishes them from non-living matter.

### Brief Bio

Philip Ball is a freelance writer and broadcaster. He is also an Education Board member of the Molecular Frontiers Foundation. He worked for over 20 years as an editor for Nature. He writes regularly in the scientific and popular media. He has authored many books on the interactions of the sciences, the arts, and the wider culture, including *H2O: A Biography of Water*, *Bright Earth: The Invention of Colour*, *The Music Instinct*, *Curiosity: How Science Became Interested in Everything*, and *The Water Kingdom: A Secret History of China*. His book *Critical Mass* *How Life Works: A User's Guide to the New Biology* won the 2005 Aventis Prize for Science Books. Philip is a presenter of Science Stories, the BBC Radio 4 series on the history of science, and is the 2022 recipient of the Royal Society's Wilkins-Bernal-Medawar Medal for contributions to the history, philosophy or social functions of science. His latest book is *How Life Works: A User's Guide to the New Biology* (2023).

Here are some examples of his books.





## Ed Boyden, Ph.D.

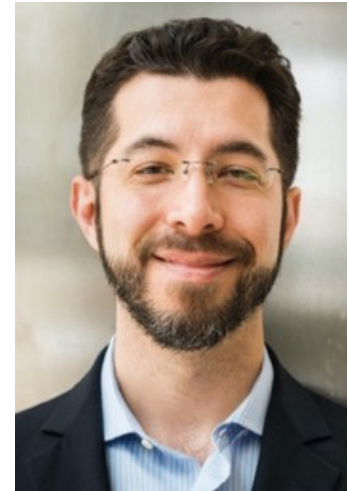
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[Piatkevich KD, Boyden ES. Optogenetic control of neural activity: The biophysics of microbial rhodopsins in neuroscience. Q Rev Biophys. 2023 Oct 13;57:e1. PMID: 37831008.](#)



### Abstract

Analyzing, repairing, and simulating complex biological systems, such as the brain, require tools for systematically mapping, dynamically observing, and dynamically controlling these systems. We are discovering new molecular principles to enable such technologies. For example, we discovered that one can physically magnify biological specimens by synthesizing dense networks of swellable polymer throughout them, and then chemically processing the specimens to isotropically swell them. This method, which we call expansion microscopy, enables ordinary microscopes to do nanoimaging – important for mapping molecules throughout cells, tissues, and organs. As a second example, we serendipitously discovered that microbial rhodopsins, genetically expressed in neurons, could enable their electrical activity to be precisely controlled in response to light. These molecules, now called optogenetic tools, enable causal assessment of how neurons contribute to behaviors and pathological states, and are yielding new candidate treatment strategies for brain diseases. Finally, in order to reveal relationships between different molecular signals within a cell, we are developing spatial and temporal multiplexing strategies that enable many such signals to be imaged at once in the same living cell. Scientifically, we are focusing on the integrated application of these tools to collect ground truth-oriented data for the worm *C. elegans* and the larval zebrafish, with the goal of creating biologically accurate computer simulations of entire brains.

### Brief Bio

Ed Boyden is the Y. Eva Tan Professor in Neurotechnology at MIT, an investigator of the Howard Hughes Medical Institute and the MIT McGovern Institute, and professor of Brain and Cognitive Sciences, Media Arts and Sciences, and Biological Engineering at MIT. He leads the Synthetic Neurobiology Group, which develops ground truth-oriented tools for analyzing and repairing the brain, and applies them systematically to reveal fundamental mechanisms underlying brain functions, as well as to repair the brain. He co-directs the MIT Center for Neurobiological Engineering and the K. Lisa Yang Center for Bionics. Amongst other recognitions, he has received the Wilhelm Exner Medal (2020), the Croonian Medal (2019), the Canada Gairdner International Award (2018), the Breakthrough Prize in Life Sciences (2016), the Jacob Heskell Gabbay Award (2013), and the Grete Lundbeck Brain Prize (2013). He is an elected member of the National Academy of Sciences (2019), the American Academy of Arts and Sciences (2017), and the National Academy of Inventors (2017). Ed received his Ph.D. in neurosciences from Stanford University as a Hertz Fellow, working in the labs of Jennifer Raymond and Richard Tsien, where he discovered that the molecular mechanisms used to store a memory are determined by the content to be learned. In parallel to his PhD, as an independent side project, he co-invented optogenetic control of neurons, which is now used throughout neuroscience.





## **William DeGrado, Ph.D.**

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Korendovych IV, DeGrado WF. (2020) De novo protein design, a retrospective. [Quarterly Review of Biophysics. 53:e3. doi:](#)

[10.1017/S0033583519000131](https://doi.org/10.1017/S0033583519000131). PMID: 32041676



### **Title: De novo protein design of functional proteins**

Not too long ago, the design of proteins from scratch that fold into predictable structures was considered an impossible task, but with advances in machine learning and artificial intelligence it is now increasingly routine. Given our ability to design protein structures the next challenge has been to design function. The success or failures of the designs informs our understanding of the principles underlying the desired function and additionally provides the first step towards the design of proteins with useful functions not available to natural proteins. This talk will describe the design of proteins for the recognition and delivery of small molecule drugs, nucleotide sequencing, and environmentally friendly chemical processes.

### **Brief Bio**

William (Bill) DeGrado's work focuses on the design of small molecule drugs, peptides, and proteins to address biological and mechanistic questions. Since 2011, Bill has been a professor in the Department of Pharmaceutical Chemistry at the University of California San Francisco. Prior to UCSF, he was a member of DuPont Central Research and DuPont Merck Pharmaceutical Company from 1981 to 1996, and then the Raiziss Professor in the Department of Biochemistry and Biophysics at the University of Pennsylvania (1996 – 2011). He graduated from Kalamazoo College in 1978, received his Ph.D. in organic chemistry from the University of Chicago (1981), and joined DuPont Central Research without an intervening postdoctoral position.





## **Magdalena Eriksson, Ph.D.**

West Sweden Nexus for Sustainable Development

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Magdalena Eriksson promotes scientific knowledge and global exchange initiatives for sustainable development. She combines her background in scientific research, academic development and institution building with international experience to address urgent developmental challenges, primarily in the Global South.

Magdalena Eriksson received her Ph.D. in physical chemistry from Chalmers University of Technology, where she focused on biophysical studies of nucleic acids structure and dynamics with Prof. Bengt Nordén as her thesis advisor. Her Ph.D. studies were followed by post-doc and extended research visits in New York City, USA, at Columbia University and Memorial Sloan Kettering Cancer Center.

She also held faculty research positions in Denmark and Sweden. She became a docent at Chalmers in 1997 and later associate professor at University of Cape Coast, Ghana, where she was the founding head of the Department of Medical Biochemistry. In 2012, she was appointed the first President of African Institute for Mathematical Sciences (AIMS) Ghana, from where she moved on to AIMS Global Director of Academic Development. She contributed to the start of new educational and research AIMS centres in Cameroon, Tanzania, Rwanda and Senegal.

Magdalena also holds a MSc in journalism from Columbia University. Magdalena contributed to the inception of Molecular Frontiers. She served as the first Executive Vice President of the organisation and, since many years, as a member of its board of directors.







## Alan Fersht, Ph.D.

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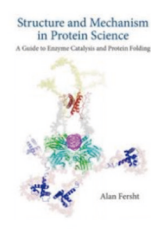
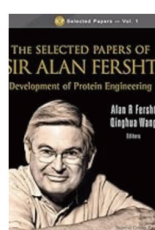
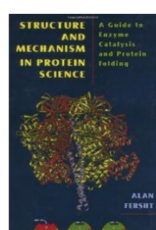
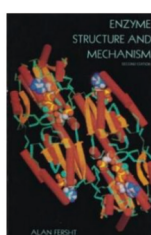
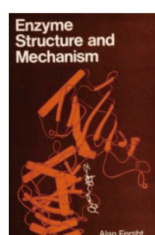
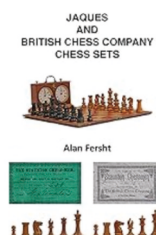
Fersht, A. R. (2024) From covalent transition states in chemistry to noncovalent in biology: from Brønsted  $\beta$ -to  $\Phi$ -value analysis of protein folding. *Quarterly Reviews of Biophysics*, Volume 57, 2024, e4DOI:

<https://doi.org/10.1017/S0033583523000045>



### From covalent transition states in chemistry to noncovalent in biology: from Brønsted $\beta$ - to $\Phi$ -value analysis

Solving the mechanism of a chemical reaction requires determining the structures of all the ground states on the pathway and the elusive transition states linking them. 2024 is the centenary of Brønsted's landmark paper that introduced the  $\beta$ -value and structure-activity studies as the only experimental means to infer the structures of transition states. It involves making systematic small changes in the covalent structure of the reactants and analysing changes in activation and equilibrium free energies. Protein engineering was introduced 60 years later for an analogous procedure,  $\Phi$ -value analysis, to analyse the noncovalent interactions in proteins central to biological chemistry: from the use of binding energy in enzymatic catalysis; specificity; and the pathway of protein folding. I give a personal account on how a background in organic and physical chemistry in particular has guided me throughout working at the interface of chemistry, biology and physics for problem solving and discovery.



### Brief Bio

Alan Fersht is an emeritus professor of Chemistry and group leader at the MRC Laboratory of Molecular Biology and former Director of the MRC Cambridge Centre for Protein Engineering. He enjoys combining methods and ideas of molecular and structural biology with those from biophysics and chemistry to study the structure, activity, stability and folding of proteins, and the role of protein misfolding and instability in cancer and disease. He has won many international awards, the latest of which is the Copley Medal (for Biological Sciences) of the Royal Society, 2020, the world's oldest scientific prize. Others include: Royal Medal (for Physical Sciences) of the Royal Society, 2008; the FEBS Anniversary Prize, Jerusalem, 1980; Novo Biotechnology Award, 1986; Charmian Medal of the Royal Society of Chemistry, 1986 (for Enzymology); The Gabor Medal of the Royal Society, 1991 (for Molecular Biology); Max Tishler Lecture and Prize, Harvard University, 1992; FEBS Datta Lecture and Medal, 1993; Jubilee Lecture and Harden Medal of the Biochemical Society, 1993; the Feldberg Foundation Prize 1996; Distinguished Service Award (for Protein Engineering), Miami Nature Biotechnology Winter Symposium, 1997; the Davy Medal of the Royal Society 1998 (for Chemistry); the Chaire Bruylants, 1999; and Natural Products Award of the Royal Society of Chemistry, 1999. He is a fellow of the Royal Society, international member of the National Academy of Sciences (USA), honorary foreign member of the American Academy of Arts and Sciences and of Accademia Nazionale dei Lincei, member of EMBO and of Academia Europaea.





## **Astrid Gräslund, Ph.D.**

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<https://www.su.se/english/research/research-groups/astrid-graslund-s-research-group>

<https://www.lindau-nobel.org/member/astrid-graslund/>



Astrid Gräslund earned her Master of Science in Engineering (Applied Physics) at the Royal Institute of Technology, Stockholm, Sweden in 1967 and Doctor of Philosophy in Biophysics at Stockholm University in 1974. She was a research assistant in the Department of Biophysics, Stockholm University, assistant, and associate professor in the Department of Biophysics at Stockholm University. She then became a professor of Medical Biophysics at University of Umeå. She later returned to Stockholm University and became a professor of Biophysics. She was a visiting scientist at University of Nijmegen, the Netherlands, and at Southern Illinois University, Carbondale, IL in 1987-88; and at The Scripps Research Foundation, La Jolla, CA in 2003. She was the Chairman of the Department of Biochemistry & Biophysics at Stockholm University between 2006 and 2011.

Gräslund won the 1982 Lindbom Prize, awarded by the Royal Swedish Academy of Sciences; the 1995 Arrhenius Plaque, awarded by the Swedish Chemical Society; the 2007 Björkén prize, awarded by Uppsala University, the 2018 Bror Holmberg Medal, awarded by the Swedish Chemical Society. She was elected to Class for Chemistry, the Royal Swedish Academy of Sciences in 1993, to the International Society of Magnetic Resonance in 2009, and to the American Biophysical Society in 2018.

Astrid Gräslund has been the Chairman of the Board of The Magn. Bergvall Foundation since 2014. She was a member of the Board of the Swedish Natural Science Research Council, 1995-2000 and 2004-2006, the Second Vice President of the Royal Swedish Academy of Sciences, 2000–2003, Secretary and Deputy Member of the Nobel Committee for Chemistry, 1996-2014, and Deputy Member of the Board of the Nobel Foundation, 2006-2015. She was Chairman of the Class of Chemistry at the Royal Swedish Academy of Sciences 2010-2015, Member of the Scientific Advisory Board of the Max Planck Institute of Multidisciplinary Sciences of Biophysical Chemistry, since 2017, and Member of an ERC Consolidator Grant Evaluation panel in 2022. Gräslund published over 380 scientific papers. She is also co-founder and owner of two start-up companies: AmyloiDia Sweden AB for Alzheimer's disease diagnostics and CellPept AB for Alzheimer's disease therapy.





## Saul Griffith, Ph.D.

<https://www.saulgriffith.com/>

<https://www.macfound.org/fellows/class-of-2007/saul-griffith>

New South Wales, Australia

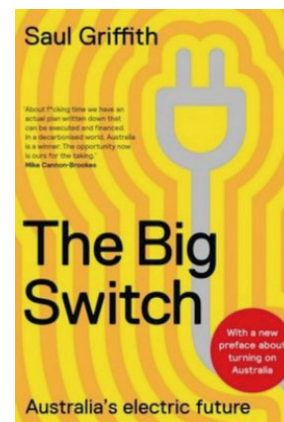
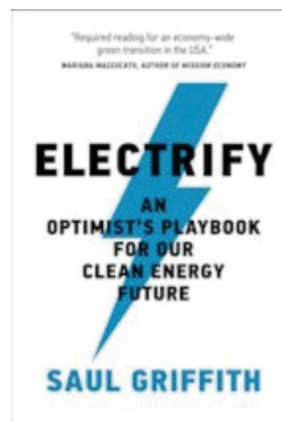
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### Abstract

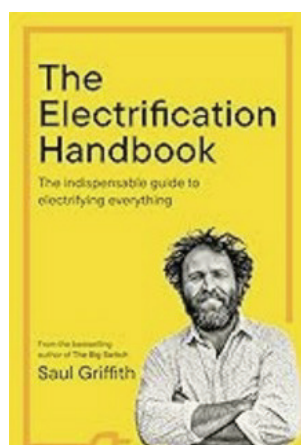
Saul is founder and chief scientist at [Otherlab](#), an independent R&D lab. Otherlab has led projects for DARPA, NSF, NASA, NIH, DOE, EERE, ARPA-e and SOCOM, in a broad array of technologies in climate, energy, materials, manufacturing and robotics. Otherlab has led to the founding and co-founding of more than one dozen companies in Silicon Valley. These include Treau (now Gradient), Sunfolding, Roam Robotics, Fablight, Wattzon, Canvas Construction, Makani Power (acquired by Google), Instructables.com (acquired by Autodesk), Howtoons, Stow Energy, Channing Street Copper, and Aikido Technologies. Saul's work on climate solutions through Otherlab has led to his recent work as co-founder and chief scientist at [Rewiring America](#); [Rewiring Australia](#) and [Rewiring Aotearoa](#). These nonprofits are dedicated to widespread electrification as a means of fighting climate change, with work encompassing policy, regulatory, technology and community. Rewiring America was instrumental in the policy victories encompassed by the Biden Administrations "Inflation Reduction Act"-the world's largest commitment to climate action at scale to date.



### Brief Bio

Saul received his Ph.D. at MIT in 2004 at the junction between materials science and information theory including a theory of self-replicating machines and mathematical proof of the 3d-completeness of origami type folding. Prior to MIT, he studied in Sydney, Australia and at UC Berkeley in metallurgical engineering. In the renewable energy space, Saul's analysis on energy flows is used to understand where governments and industry can focus decarbonising efforts for the maximum impact over the short term. Saul is the author of three books including [Electrify](#), [The Big Switch](#) and [The Wires that Bind: Quarterly Essay](#), which are used as policy blueprints, drawing on empirical data that make the case for rapid whole of economy electrification as a means to cut domestic emissions and meet global emissions reduction targets.

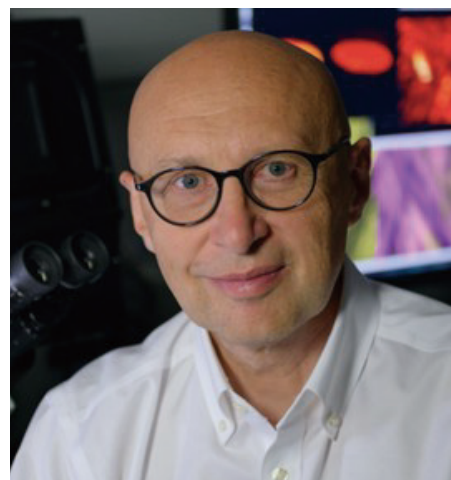
Saul was named a Macarthur Fellow in 2007 and a World Economic Forum Young Global Leader in 2011.





## **Stefan W. Hell, Ph.D.**

Max Planck Institute for Multidisciplinary  
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Göttingen & Max Planck Institute for Medical  
Research  
Heidelberg Germany  
[https://www.nobelprize.org/prizes/chemistry/  
2014/hell/facts/](https://www.nobelprize.org/prizes/chemistry/2014/hell/facts/)



### **Molecular resolution and dynamics in fluorescence microscopy**

I will show how a deep understanding of the principles of diffraction-unlimited fluorescence microscopy has given rise to MINFLUX, a newer super-resolution method that reaches the Angstrom range, i.e. >200 times below the diffraction resolution limit. MINFLUX is currently being used for a variety of applications in the biomedical sciences. A unique advantage of MINFLUX is the direct measurement of dynamic processes and conformational changes of individual proteins in cells, such as the stepping of the motor proteins kinesin-1 and dynein on microtubules. In contrast to all super-resolution methods known to date, MINFLUX does not fundamentally require an ON/OFF process, meaning that it can also separate constantly emitting fluorophores in the nanometer range. The ability to separate constantly emitting fluorophores at nanometer distances has the potential to directly measure the inner workings of individual proteins.

### **Brief Bio**

Stefan W. Hell is a scientific member of the Max Planck Society and a director at both the Max Planck Institute for Medical Research and the Max Planck Institute for Multidisciplinary Sciences in Göttingen, where he currently leads the Department of NanoBiophotonics. He is an honorary professor of experimental physics at the University of Göttingen and adjunct professor of physics at the University of Heidelberg. He is a member of the board of directors of the Göttingen Laser Laboratory as well as a member of the Academy of Sciences of Göttingen and Heidelberg. Stefan W. Hell received his diploma (1987) and doctorate (1990) in physics from the University of Heidelberg. From 1991 to 1993 he worked at the European Molecular Biology Laboratory, also in Heidelberg, and followed with stays as a senior researcher at the University of Turku, Finland, between 1993 and 1996, and as a visiting scientist at the University of Oxford, England, in 1994. In 1997 he was appointed to the Max Planck Institute for Biophysical Chemistry in Göttingen, where he has built up his current research group dedicated to sub-diffraction- resolution microscopy. In 2002, following his appointment as a director, he established the department of Nanobiophotonics. From 2003 to 2017 he also led a research group at the German Cancer Research Center (DKFZ) in Heidelberg. Stefan W. Hell is credited with having conceived, validated and applied the first viable concept for breaking Abbe's diffraction-limited resolution barrier in a light-focusing microscope. He has published about 300 original publications and has received several awards, including the Leibniz Prize (2008), the Otto-Hahn-Prize in Physics (2009), the Körber European Science Prize (2011) and in 2014 the Kavli Prize in Nanoscience and the Nobel Prize in Chemistry. In 2022 Hell was admitted to the "Order Pour le Mérite". In 2023 he received the honorary medal "In Publica Commoda" of the University of Göttingen and was awarded the Werner-von- Siemens-Ring.





## **Tim Hunt, Ph.D.**

2002 Nobel laureate in Medicine

The Francis Crick Institute, London, UK

<https://www.nobelprize.org/prizes/medicine/2001/hunt/biographical/>



### **Lessons from a life in science**

I always wanted to be a scientist. I loved gadgets and melting lead pipes and electrolyzing solutions of salt to make hydrogen and chlorine. Luckily, I had excellent teachers who channeled these enthusiasms into a deeper and more formal understanding of chemistry and biology so that it was possible to study Natural Sciences at Cambridge and carry on there with a Ph.D. in biochemistry, about the control of haemoglobin synthesis. It took ten years, some interesting side roads, a lot of travel and a devastating fire to solve the problem of how the synthesis of haem was coordinated with the synthesis of globin. Along the way, I discovered (quite by accident) that double-stranded RNA (dsRNA) was a potent inhibitor of protein synthesis. Thanks to the fire, we moved close to the famous MRC Laboratory of Molecular Biology, where the canteen was a great place to arrange collaborations and learn about science from elder statesmen like Francis Crick, Sydney Brenner, Max Perutz and Fred Sanger and also from one's peers, several of whom would later win Nobel prizes. The discussions were very open and free-flowing. They were fun and helped a lot. The fire also had a kind of purifying effect, destroying accumulated confusing data and allowing the purchase of new equipment. Fairly soon we discovered that both lack of haem and the presence of dsRNA activated protein kinases that phosphorylated the initiation factor eIF-2, reducing its activity. Having solved our problem; what to do next? I remembered a talk I'd heard as a student about sea urchin eggs, how they activated protein synthesis after fertilization. When the chance came to spend a summer at the MBL Woods Hole I jumped at it, and during my fifth summer there discovered cyclin, the disappearing protein that turned out to be a "key regulator of the cell cycle". That was fun too.

### **Brief Bio**

Tim Hunt grew up in Oxford, where he became fascinated by science at the Dragon School. At 14, he entered Magdalen College School, where his interest in biology grew. Tim entered Clare College, Cambridge in 1961 to read Natural Sciences. He joined the Department of Biochemistry in 1964 as a graduate student working on the control of haemoglobin synthesis. In 1968 he moved to the Albert Einstein College of Medicine in New York as a postdoctoral Fellow with Irving London. Tim returned to the Department of Biochemistry in Cambridge in 1971 where he continued to work on translational control throughout the 1970s. He taught summer courses at the Marine Biological Laboratory, Woods Hole, Massachusetts from 1977 to 1983, looking at changes in protein synthesis in sea urchin and clam eggs after fertilisation. In 1979, he helped Joan Ruderman and Eric Rosenthal with experiments on the translational control of maternal mRNA in clam eggs, where two of the major mRNAs concerned later turned out to be the A and B-type cyclins. By 1982, Tim had almost exhausted the potential of sea urchin eggs, but it was then that he performed the experiment that led to the discovery of cyclins and subsequent research on the control of the cell cycle. In 1990, Tim joined ICRF (subsequently Cancer Research UK) in London. He became a fellow of the Royal Society in 1991, a foreign associate of the US National Academy of Sciences in 1999 and shared the Nobel Prize for Physiology or Medicine with Lee Hartwell and Paul Nurse in 2001. He enjoys cooking, photography and making up problems for Molecular Biology of the Cell with his friend John Wilson. In 2016, he and his wife Mary Collins moved to Okinawa, where Mary was the Provost of OIST (Okinawa Institute of Science and Technology). In 2022, Mary was appointed Director of the Blizard Institute of QMUL and they returned to London, where Tim holds an emeritus position at the Francis Crick Institute.





## **Nancy Y. Ip, Ph.D.**

The Hong Kong University of Science and Technology

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### **Understand and Combat Alzheimer's Disease**

Alzheimer's disease (AD), the most common form of dementia, is a leading cause of mortality in the elderly. At present, there are only two very recently approved disease-modifying drugs, which target patients with early AD. However, most patients are clinically diagnosed when the disease is already at a moderate to advanced stage. Thus, we aim to understand and combat the disease using innovative approaches. Through basic research investigations, we elucidated molecular mechanisms underlying disease pathology, identified therapeutic targets, and developed potential drug leads. Through pioneering human genetic studies, we identified novel AD-associated genetic factors and biomarkers, established the first omics database for ethnic Chinese, and developed a novel diagnostic test for AD risk prediction and early diagnosis. We also leveraged the cutting edge CRISPR-Cas9 technology to develop a gene therapy treatment for familial AD. In this talk, I would like to share our recent findings in elucidating the roles of innate immunity in the pathogenesis of AD. Microglia, the resident immune cells in the brain, play a crucial role in the clearance of amyloid-beta ( $A\beta$ ), a key pathological hallmark of AD. We demonstrated how stimulation of an immune protein signaling enhances the microglial clearance of  $A\beta$ , leading to decreased AD pathology and alleviated memory impairment in a transgenic mouse model of AD. We also elucidated how this immune signaling is inhibited in patients with AD. These exciting findings highlight immune modulation as a potential AD therapeutic strategy.

### **Brief Bio**

Nancy Ip is the President of The Hong Kong University of Science and Technology (HKUST) and the Morningside Professor of Life Science. Taking office in October 2022, she is the first female President of a publicly funded university in Hong Kong. After receiving her PhD degree in Pharmacology from Harvard University, Ip became a Senior Staff Scientist at Regeneron Pharmaceuticals Inc. in New York. Since joining HKUST in 1993, she has served as the Head of the Department of Biochemistry, Dean of Science, Vice-President for Research and Development before taking office. Ip is world-renowned for her significant contributions to the field of neuroscience in understanding the complex mechanisms that underlie normal brain functions, as well as drug discovery for neurodegenerative diseases. Her outstanding research has resulted in over 330 scientific papers and 70 patents. As a distinguished neuroscientist, Ip has been elected to various academies, including the Chinese Academy of Sciences, the US National Academy of Sciences, the American Academy of Arts and Sciences, the World Academy of Sciences, the Chinese Academy of Medical Sciences, and the Hong Kong Academy of Sciences. She is a recipient of numerous awards and honors including the National Natural Science Awards, the L'OREAL-UNESCO for Women in Science Award, and the 10 Science Stars of China by Nature. Ip has contributed to shaping of global research policy through her membership at various strategic initiatives such as the Leadership Group of the Davos Alzheimer's Collaborative. She also actively serves on local committees, such as the Chief Executive's Council of Advisers, to help steer the strategic development of Hong Kong. Moreover, as the Council Chair and founding member of the Greater Bay Area Association of Academicians, she fosters cooperation among academics in Hong Kong and the Mainland to help advance science and technology in the Greater Bay Area.





## Joi Ito, Ph.D.

President, Chiba Institute of Technology  
Chiba Japan

<https://www.it-chiba.ac.jp/english/about/message/>

<https://www.nae.edu/173612/Joichi-Ito>

<https://www.amacad.org/person/joichi-ito>



He served as Director of the MIT Media Lab from 2011 to 2019. Ito was Chairman of the Board of PureTech Health and was previously the Board Chair and Chief Executive of Creative Commons. He has served on other boards, including at The New York Times Company, Sony Corporation, the John S. and James L. Knight Foundation, the John D. and Catherine T. MacArthur Foundation, The Internet Corporation for Assigned Names and Numbers (ICANN), The Mozilla Foundation, The Open Source Initiative, and The Electronic Privacy Information Center (EPIC).

Joi Ito earned a doctor of philosophy degree from Keio University Graduate School of Media and Governance in 2018 for his thesis, [The Practice of Change](#). He serves as a distinguished researcher at Keio University. Ito is the co-author with Jeff Howe of *Whiplash: How to Survive Our Faster Future* (Grand Central Publishing, December 2016). He was elected to US National Academy of Engineering and the American Academy of Arts and Sciences.

Ito is the President of the Chiba Institute of Technology (CIT), the Chief Architect, Co-Founder and Board Member of Digital Garage and serves on several for-profit and non-profit boards. He is a director of GMJP, an early-stage WEB3 fund. He is the Director of the Center for Radical Transformation at CIT and Associate Director of the Health Data Architecture Lab, and Visiting Professor at the Fujita Medical University. He is a member of The Digital Society Council of the Digital Agency of Japan and an Advisory Board Member of the Ministry of Economy, Trade and Industry's Demonstration Project for the Construction of Digital Public Goods Using Web 3.0 and Blockchain. He advises numerous companies including Kodansha, Suntory Holdings, MUFG and Deloitte Tohmatsu Group. He is also the co-founder of Neurodiversity School in Tokyo.



In 2011, he received a Lifetime Achievement Award from the Oxford Internet Institute for his work as one of the world's leading Internet activists. He received an honorary Doctor of Letters degree from The New School in New York City in 2013 and an honorary Doctor of Humane Letters from Tufts University two years later. In 2013, he was inducted into the SXSW Interactive Hall of Fame. In 2017, he received the IRI Medal and was elected to the American Academy of Arts and Sciences. The following year, the [Frederick Douglass Family Initiatives and the Antiracist Research & Policy Center](#) named Ito to the FD200, a list of 200 people whose work and activism on behalf of equality and freedom reflects the spirit of Frederick Douglass. Ito was awarded a Lifetime Achievement Award from EPIC in 2019. Joichi Joi Ito is a venture capitalist, entrepreneur, writer and scholar focusing on the ethics and governance of technology. As an activist, he works to tackle complex problems such as climate change and societal inequity and redesign the systems of scholarship and science. Ito was an early investor in many startup companies including Flickr, littleBits, Optimus Ride, FormLabs, Kickstarter, and Twitter.





## Lorie Karnath, Ph.D.

President, Molecular Frontiers Foundation

<https://www.molecularfrontiers.org>

<https://www.molecularfrontiers.org/people/108>

[https://en.wikipedia.org/wiki/The\\_Explorers\\_Club](https://en.wikipedia.org/wiki/The_Explorers_Club)



Lorie Karnath is President of the Molecular Frontiers Foundation. She is also the co-founder of The Explorers Museum. Lorie also served as the 37th president of the renowned Explorers Club, the second woman to hold this position in the club's 108-year-old history. Lorie served for 3 terms (2009-2012) and during her tenure conceived and spearheaded the Club's development campaigns, raising significant funding for the organization. During this period, Ms. Karnath also executed and oversaw the completion of a substantial restoration of the Club's historic headquarters. Lorie participates on a number of international scientific and educational boards and has conceived and spearheaded scientific and educational symposia around the world. A lifelong explorer Lorie was a fellow of the Royal Geographical Society and founding member of the RGS Hong Kong. She was also elected a fellow of the Canadian Royal Geographical Society. Lorie has helped to establish a sanctuary for the White Stork in Northern Germany and has also been involved in the creation of a number of schools in Asia. Prior to her current activities within the scientific, educational and other non-profit realm, Lorie worked for a number of years in international finance and investment banking. She has lived and worked around the world and is the author of many books on science, exploration and the arts and is a contributor to numerous international publications. She received her MBA from INSEAD and received an honorary Ph.D. from Shenandoah University.







### **Reiko Kuroda, Ph.D.**

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<https://groups.oist.jp/po/event/presidential-lecture-1>

Kuroda, R., B. Endo, M. Abe and M. Shimizu (2009) Chiral blastomere arrangement dictates zygotic left-right asymmetry pathway in snails. [\*Nature\*, 462, 790-794.](#)

Kuroda, R. (2015) A twisting story: How a single gene twists a snail - Mechanogenetics, [\*Quarterly Reviews of Biophysics, Discovery\*, 48\(4\), 445-452.](#)

Kuroda et al (2016) Diaphanous gene mutation affects spiral cleavage and chirality in snails, *Scientific Reports*, 6, 34809.

M. Abe and R. Kuroda (2019) The development of CRISPR for a mollusc establishes the formin *Lsdia1* to be the long-sought gene for snail dextral/sinistral coiling. *Development*, 146(9) Dev175976.

Kuroda, R. (2024) Using Chiroptical Spectroscopy to Gain Unique Information about the Solid State, Chapter 30, in "Chiral Luminescence: From Molecules to Materials and Devices", Edited by K. Akagi, Wiley-VCH, Inc. pp.1-36. Kuroda, R., T. Harada, and Takahashi (2024) Fast and artifact-free circular dichroism measurement of solid-state structural change, [\*Chirality\*: e3622, doi:10.1002/chir.23622.](#)

Kuroda, R. (2024) Left-Right asymmetry in invertebrates: From molecules to organisms, [\*Annual Review of Cell and Developmental Biology\*, 40, 15:1-21.](#)

### **Snail Coiling: CRISPR Editing of A Single Gene Turns Righties Into Lefties**

Reiko Kuroda is a scientist known for her seminal contributions to left-and-right asymmetry in chemistry, spectroscopy, crystallography, molecular and developmental biology. In the material domain, Reiko has developed chiroptical spectrophotometers that can measure samples of non-randomly oriented molecules such as crystals and has revealed unique molecular behaviours in the solid phase in terms of chiral recognition/discrimination/transfer. In the biology field, she has discovered that a single gene, *Lsdia1*, and mechanogenetics determine the chirality in snails. The CRISPR/Cas9 knockout of this gene altered the entire chirality of snails from dextral to sinistral, for generations to come. This gene controls the elongation of actin filaments and is ubiquitous in eukaryotes, and thus, her research provides insights into chiro-morphogenesis not only in invertebrates but vertebrates as well.

#### **Brief Bio**

Reiko Kuroda is a Distinguished Professor at Chubu University and Professor Emerita at The University of Tokyo. She was appointed Visiting Professor and a consultant at the International Institute for Sustainability with Knotted Chiral Meta Matter (WPI- SKCM2), Hiroshima University in 2024. She has published over 350 original research papers including articles in *Nature* and *Angewandte Chemie* and has given many invited lectures at international meetings. Her scientific achievements have been recognized through many prizes/awards. She is a L'Oréal UNESCO Women in Science laureate and one of 175 past/current chemists featured by the Royal Society of Chemistry UK for its 175th anniversary. Reiko is a foreign member of the Royal Swedish Academy of Sciences.

In parallel, Reiko has been active on issues related to science policy, education, women in science, science communication and the environment, both nationally and internationally. Her experience includes Scientific Advisory Board member to the UN Secretary General on SDGs, Vice President of ICSU (International Council for Science), and G7 GEAC (Gender Equality Advisory Council) member for the UK (2021), Germany (2022) and Japan (2023). Currently she is a Fellow of TWAS (The World Academy of Sciences), member of the Club of Rome, Steering Committee member of ICEF (Innovation for Cool Earth Forum), board member of INGSA (International Network for Government Science Advice) -Asia and ISC (International Science Council) fellow.





## Robert Langer, Sc.D.

Office of the Institute Professors (MIT)

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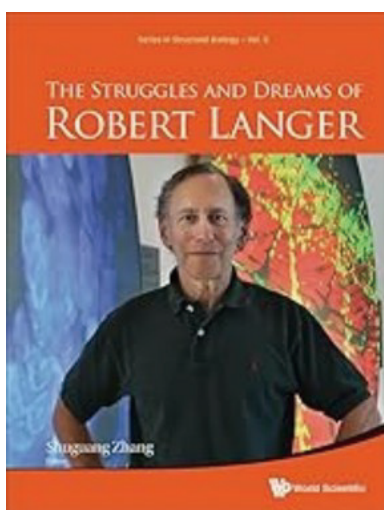
<https://molecularfrontiers.org/people/139>

[Langer R. \(2019\) Control the movement of molecules. Quarterly Reviews of Biophysics, 52, E5-21.](#)



### Recent Excitement in Designer Materials and Sustained Release

Advanced chemical delivery systems are having an enormous impact on human health. We start by discussing our early research on developing the first controlled release systems for macromolecules and the isolation of angiogenesis inhibitors and how these led to numerous new therapies. This early research then led to new drug delivery technologies including chemical nanoparticles and nanotechnology that are now being used for treating cancer, other illnesses and in vaccine delivery including COVID vaccines. In addition, by combining mammalian cells, including stem cells, with synthetic polymers, new approaches for engineering tissues are being developed that may someday help in various diseases. Examples in the areas of cartilage, skin, blood vessels, and heart tissue are discussed.



### Brief Bio

Robert Langer is one of 9 Institute Professors at the Massachusetts Institute of Technology (MIT); being an Institute Professor is the highest honor that can be awarded to a faculty member. He has written over 1,600 articles, which have been cited over [433,000 times](#); [his h-index of 327](#) is the highest of any engineer in history and the 6th highest of any individual in any field. His patents have licensed or sublicensed to over 400 companies; he is a cofounder of a number of companies including Moderna. Dr Langer served as Chairman of the FDA's Science Board (its highest advisory board) from 1999-2002. His over 220 awards include both the United States National Medal of Science and the United States National Medal of Technology and Innovation (he is one of 3 living individuals to have received both these honors), the Charles Stark Draper Prize (often called the Engineering Nobel Prize), Queen Elizabeth Prize for Engineering, Albany Medical Center Prize, Breakthrough Prize in Life Sciences, Kyoto Prize, Wolf Prize for Chemistry, Millennium Technology Prize, Priestley Medal (highest award of the American Chemical Society), Gairdner Prize, Hoover Medal, Dreyfus Prize in Chemical Sciences, BBVA Frontiers of Knowledge Award in Biomedicine, Balzan Prize, the Dr. Paul Janssen Award, and Kavli Prize in Nanoscience. He holds 42 honorary doctorates, including Harvard, Yale, Columbia, and Northwestern, and has been elected to the National Academy of Medicine, the National Academy of Engineering, the National Academy of Sciences and the National Academy of Inventors.





## **Karin Markides, Ph.D.**

President and CEO,  
Okinawa Institute of Science and Technology, Japan

<https://www.oist.jp>

<https://www.oist.jp/about/president>

<https://molecularfrontiers.org/people/119>

<https://www.kva.se/en/contact/karin-markides-2/>



Dr. Karin Markides earned her doctorate degree in analytical chemistry from University of Stockholm in Sweden and had a research career in USA and Sweden. She became Chair Professor of Analytical Chemistry Science and Engineering, Uppsala University, Sweden 1989, and was active Dean of Chemistry and Chemical Engineering 1996-2002. During 2003-2004 she was a Visiting Professor at Stanford University at the Chemistry Department. She became a member of the Royal Swedish Academy of Engineering Sciences, IVA, in 1992, and the Royal Swedish Academy of Sciences, KVA, in 1999. After serving as Deputy Director General of the State Agency for Innovation Systems in Sweden (2004-2006), she was elected President and CEO of Chalmers University of Technology in Sweden 2006-2015. Dr. Markides has also been deeply involved in policy development, serving as Development Leader and Chairman of The Swedish Scientific Council for Sustainable Development (2015-2019) and President of CESAER (Conference of European Schools for Advanced Engineering Education and Research) (2009-2011). In 2019-2022 she was elected President and CEO of American University of Armenia, and 2021-2024 elected Chairman for the Danish Technical University, DTU. In February 2023, she was elected President and CEO of Okinawa Institute of Science and Technology to assume the post on June 1, 2023.





## Christina Moberg, Ph.D.

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Margarita, C. et al, ChemSystemsChem 2024, 6, e202300045.

<https://chemistry>

[-europe.onlinelibrary.wiley.com/doi/full/10.1002/syst.202300045](https://chemistry-europe.onlinelibrary.wiley.com/doi/full/10.1002/syst.202300045)



### **Making single handed molecules far from equilibrium**

Access to enantiomerically pure, or “one-handed”, chiral compounds is vital for applications within both life-sciences and material sciences. Such compounds can be obtained either via separation of mixtures of the two hands or by synthesis of the pure compound. Minor amounts of the unwanted hand are, however, usually obtained along with the desired compound. In the lecture, I will describe how the “wrong” hand during the reaction can be recycled by feeding the system with chemical energy, and thereby be given new chances to undergo a successful transformation.

### **Brief Bio**

Christina Moberg is an emeritus professor of organic chemistry at KTH Royal Institute of Technology in Stockholm. Her research interests are devoted to the development of organic synthetic methodology employing homogenous catalysis. Special interests have been devoted to the role of symmetry in asymmetric reactions, the design of self-adaptable ligands and the use of interelement compounds as synthetic tools. Her present interests are focused on recycling dissipative networks. She has supervised the work of 25 PhD students and published her work in about 200 scientific papers.

Christina Moberg is a member of the Royal Swedish Academy of Sciences, the Royal Swedish Academy of Engineering Sciences, the European Academy of Sciences and Academia Europea, and an external member of the Cyprus Academy of Sciences, Letters and Arts. She was the President of the Royal Swedish Academy of Sciences 2016–2018, she served as the President of the European Academies' Science Advisory Council, EASAC, 2020–2023 and she has been vice President and the vice Dean of KTH. She is an honorary doctor at Lund University, Sweden, honorary professor at Tianjin University, China, fellow of Chemistry Europe, and honorary fellow of the Royal Society of Chemistry. She has received several awards, such as the Göran Gustafsson prize from the Royal Swedish Academy of Sciences, the Rosalyn Franklin Lecture tour in Britain, and Chevalier de l'Ordre National du Mérite from the French President.





## **Jens Nielsen, Ph.D.**

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### **New insight into cellular metabolism from the use of mathematical models**

Cells' metabolism is central to their ability to grow and divide. It ensures that nutrients are converted into energy and building blocks, e.g. amino acids, which can be used to synthesize proteins, DNA, lipids and the many other components that make up a living cell. The metabolism of cells has been mapped by detailed biochemical studies over the last 100 years, where the individual chemical reactions have been identified together with the enzymes that catalyze the individual reactions. We thus have an overview of all the many chemical reactions that take place in a cell, and in a yeast cell there are more than 4,000 chemical reactions associated with more than 1,100 proteins, while in human cells there are close to 13,000 identified reactions associated with close to 3,000 proteins. By using mathematical models, it is possible to collect all information about the metabolism of cells and thus study how the many different reactions affect each other. In the presentation, I will present how these models not only can be used in basic studies of cell metabolism, but also they can also be used within biotechnology and human medicine.

### **Brief Bio**

Jens Nielsen has an MSc degree in Chemical Engineering and a PhD degree (1989) in Biochemical Engineering from the Danish Technical University (DTU), and after that established his independent research group and was appointed full Professor there in 1998. He was Fulbright visiting professor at MIT in 1995-1996. At DTU he founded and directed Center for Microbial Biotechnology. In 2008 he was recruited as Professor and Director to Chalmers University of Technology, Sweden, where he was directing a research group of more than 60 people. At Chalmers he established the Area of Advance Life Science Engineering, a cross departmental strategic research initiative and was founding Head of the Department of Biology and Biological Engineering, which encompassed more than 200 people. Jens Nielsen was a co-founder of the Novo Nordisk Foundation Center for Biosustainability that now has more than 300 people affiliated, for which he served as Chief Science Officer in the period 2013-2018. In 2019 Jens Nielsen was appointed as CEO of the BiInnovation Institute in Denmark, which is an institute financed with more than 500 MEUR from the Novo Nordisk Foundation with the objective to foster translational research and support new spin-out companies in life sciences. Jens Nielsen has supervised more than 160 PhD students and more than 110 post-doctoral researchers. He has published so far more than 850 publications that have been cited more than [130,000 times with H-factor 165](#), and co-authored more than 40 books. He was identified as a highly cited researcher in 2015-2024. He is inventor of more than 50 patents and he has founded several biotech companies. He has received numerous Danish and international awards including the Nature Mentor Award, the ENI Award, the Eric and Sheila Samson Prime Minister Prize, the Novozymes Prize, and the Gold Medal from the Royal Swedish Academy of Engineering Sciences. He is member of several academies, including the National Academy of Engineering, the National Academy of Medicine and the National Academy of Science in USA, the Chinese Academy of Engineering, the Royal Swedish Academy of Science, the Royal Danish Academy of Science and Letters, the Royal Swedish Academy of Engineering Sciences and the American Academy of Microbiology. He was a founding president of the International Metabolic Engineering Society and served as president in the period 2012-2021.





## Bengt Nordén, Ph.D.

Founding Chairman, Molecular Frontiers Foundation Chalmers University of Technology, Gothenburg, Sweden

<https://www.molecularfrontiers.org>

<https://www.molecularfrontiers.org/people/102>

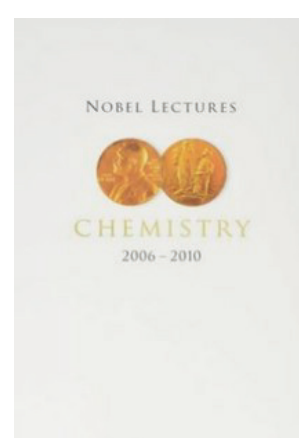
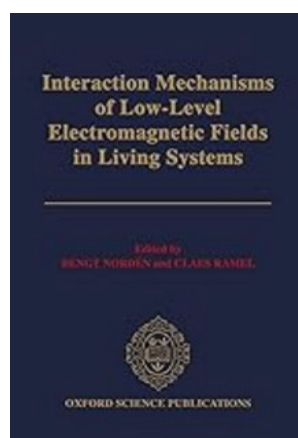
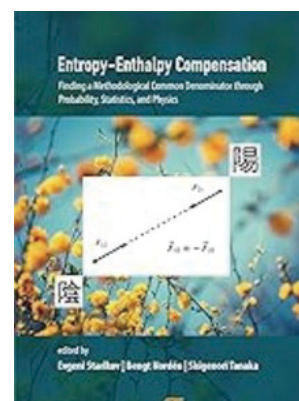
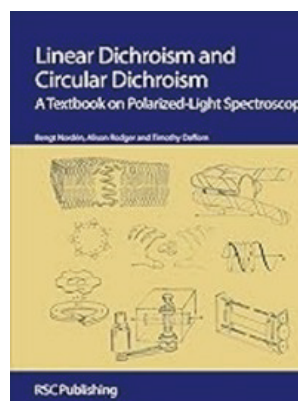
<https://www.kva.se/en/contact/bengt-norden-2/>



Bengt Nordén, after graduation in chemistry, theoretical physics and mathematics at Lund University, earned a PhD there in 1971. In 1979 he was appointed Chair Professor of Physical [Chemistry of Chalmers University of Technology](#), still a part-time appointment. Nordén's research deals with chirality and optical anisotropy, especially linear dichroism of oriented molecules. He has contributed new methods for studying molecular conformation in systems not amenable to crystallography in solution or in membranes. He has developed new DNA-binding compounds including bis-intercalating ones and peptide nucleic acids (PNA). His group discovered reorganisation between different DNA binding modes with extreme activation energies and recognition due to kinetic (in contrast to thermodynamic) selection mechanism. Using "Site Specific Linear Dichroism by Molecular Replacement", complexes of RecA and Rad51 recombinase proteins with DNA, and recombination mechanisms, were studied. Related to homologous genetic recombination reactions, hydrophobic effects on stabilization and destabilization of nucleic base stacking are studied using laser-tweezer singlemolecule pulling force measurements.

In commissions of trust Nordén has served as chair of chemistry/physics sections of the Swedish Research Council, the European Science Foundation, the Science Europe and the European Research Council. Since 2008 he is Chair of the [Nanyang Technological University](#) Research Council (Singapore) and since 2005 Chair of the board of editors of [Quarterly Reviews of Biophysics](#). Nordén is a member of the [Royal Swedish Academy of Sciences](#) where he was member of the [Nobel Committee for Chemistry](#) (2000-2003 its chairman). He is a member of several international academies including the German National Academy of Sciences (Leopoldina), [The Norwegian Academy of Science](#), [The Finnish Society of Science and Letters](#), as well as The [World Academy of Sciences](#).

Nordén is the founder of the [Molecular Frontiers](#) ([www.molecularfrontiers.com](http://www.molecularfrontiers.com)), a global organization with objective to early identify breakthroughs in science and to stimulate young people's interests in science. Molecular Frontiers has in its Advisory Board many still very research active Nobel laureates. The following awards that Nordén has received are worth to be mentioned: The Goran Gustafsson's Prize for Chemistry (1992), The King Abdullah University of Science and Technology Award (2008), The Svante Arrhenius Gold Medal (2009) and the Chalmers Gold Medal (2017). He wrote and edited the 4 books.





## Erling Norrby, M.D. and Ph.D.

The Royal Swedish Academy of Sciences  
Stockholm, Sweden

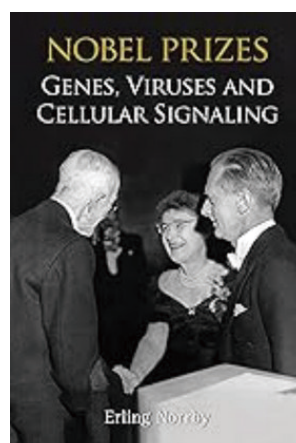
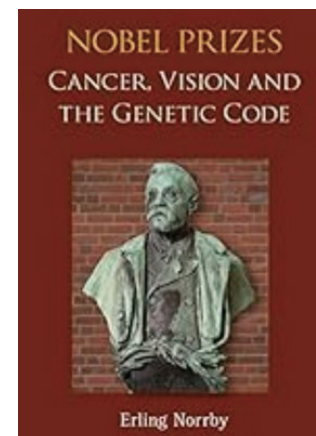
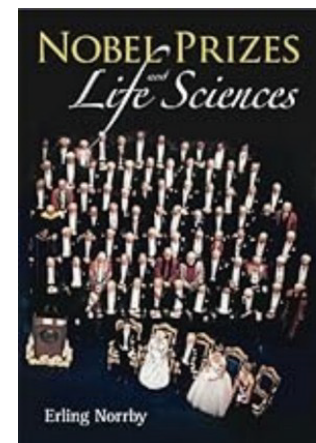
<https://molecularfrontiers.org/people/192>

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[https://en.wikipedia.org/wiki/Royal\\_Swedish\\_Academy\\_of\\_Sciences](https://en.wikipedia.org/wiki/Royal_Swedish_Academy_of_Sciences)



Erling Norrby has an MD and PhD from the Karolinska Institute, the School of Medicine, Stockholm. He was the professor of virology and chairman at the Institute for 25 years. During that time, he also served as Dean of the Faculty of Medicine for 6 years and was deeply involved in the work on Nobel prizes in physiology or medicine for 20 years. After leaving the Institute he became Permanent Secretary of the Royal Swedish Academy of Sciences for six years. During this time, he had overriding responsibility for the Nobel Prizes in physics and chemistry and was a member of the Board of the Nobel Foundation. Presently he is at the Center for the History of Sciences at the Academy. In 2010 he published the book [\*Nobel Prizes and Life Sciences\*](#), in 2013 a second book [\*Nobel Prizes and Nature's Surprises\*](#), in 2016 a third book [\*Nobel Prizes and Notable Discoveries\*](#), in 2019 a fourth book entitled [\*Nobel Prizes—Cancer, Vision and the Genetic Code\*](#) and finally in 2022 a fifth book with the title [\*Nobel Prizes – Genes, Viruses and Cellular Signaling\*](#). He has had one of the leading functions at the Royal Swedish Court as Lord Chamberlain-in-Waiting.





## **Daniela Rhodes, Ph.D.**

MRC Laboratory of Molecular Biology

<https://www2.mrc-lmb.cam.ac.uk/group-leaders/emeritus/daniela-rhodes/>

[https://www.thewlaprize.org/Laureates/2023/Daniela\\_Rhodes/](https://www.thewlaprize.org/Laureates/2023/Daniela_Rhodes/)



Daniela Rhodes is a structural biologist who studies the nature and function of chromosomes, as well as their interactions with a variety of proteins. Her research highlights include the crystallisation of the nucleosome core — the basic unit of DNA packaging — along with determining the structures of important protein–DNA complexes that are involved in transcription, such as nuclear hormone receptors and zinc-fingers. More recently, she has focused on revealing the structure of telomeres, the tips of our chromosomes, which are composed of repetitive DNA sequences and help to protect against their deterioration. Her group discovered the first protein that promotes and binds to G-quadruplex DNA. Her work in this area is contributing to our further understanding of the molecular mechanisms behind ageing and cancer propagation. Daniela has received many accolades for her scientific achievements, including the 2011 Ponte d'Oro (Golden Bridge) Prize of her birthplace in Italy, and even the naming of a minor planet, '80008DanielaRhodes', in her honour. She was elected Member of EMBO in 1996, Fellow of the Society in 2007 and Member of the Academia Europe in 2011.

Prof. Daniela Rhodes (né Bargellini) was born near Florence in Tuscany, Italy. She grew up in Sweden where she studied chemical engineering. She first joined the MRC Laboratory of Molecular Biology in Cambridge, UK in 1969, as a research assistant working on the crystal structure of tRNA and subsequently went on to do a Ph.D. with Sir Aaron Klug. Developing a novel technique, she could show that the helical periodicity of DNA changes from solution to packing into nucleosomes resolving the so-called "linking number paradox." The first breakthrough came in 1976 when she obtained crystals of the nucleosome core particle (NCP), previously characterized by Prof. Jean Thomas and Prof. Roger Kornberg. She also succeeded in reconstituting NCPs with DNA of homogeneous sequence and length that was essential for obtaining better diffracting crystals. This led to the 7Å resolution structure of the NCP in 1984 together with Prof. Timothy J. Richmond, revealing the fundamental architecture of the NCP. Prof. Rhodes remained at the MRC Laboratory of Molecular Biology as an independent group leader obtaining tenure in 1987, focusing her research on the nature and function of chromosomes. Her group determined the structures of important protein–DNA complexes involved in transcription, such as nuclear hormone receptors and zinc-fingers. Studying the structure of telomeres, the tips of chromosomes that are involved in both aging and cancer, her group made the unexpected discovery of proteins that bind and promote G-quadruplex formation as well as providing the first in vivo evidence for the role of such structures in biology. In 2011 Prof. Rhodes moved to Singapore taking up a professorship at the Nanyang Technological University (NTU). She was the founding director of the NTU Institute of Structural Biology.







## **Josiah “Jody” Rich, MD, MPH**

Department of Medicine

Brown University

Providence, Rhode Island, USA

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[https://nam.edu/member/?member\\_id=SvQB2YasImlmUTyUlboT7Q%3D%3D](https://nam.edu/member/?member_id=SvQB2YasImlmUTyUlboT7Q%3D%3D)



### **The Opioid Crisis and How to Overcome it**

The United States is currently in the midst of an overdose crisis that is driven by opioids and is the deadliest outbreak in over 100 years, with more than a million Americans dead and over 100,000 deaths a year for the past 3 years. How did this happen? What is the disease? What can be done about it and what is the relevance for the rest of the world? The answers to these questions are quite complex, as is the problem. This presentation will attempt to review critical aspects of the answers to these questions, from historical, clinical, social, political and scientific perspectives.

### **Brief Bio**

Josiah D. Rich, MD, MPH is Professor of Medicine and Epidemiology at Brown University, and a practicing Infectious Disease and Addiction specialist. He has worked at the Miriam and Rhode Island Hospitals and as a consultant to the Rhode Island Department of Corrections on a weekly basis since 1994. He is an active researcher with continuous federal research funding since 1995 and is Principal or Co-Investigator on numerous ongoing grants. His primary field and area of specialization and expertise is in the overlap between infectious diseases and illicit substance use, the treatment and prevention of HIV infection, and the care and prevention of disease in addicted and incarcerated individuals. He is the Senior Medical Advisor and Co-founder of The Center for Health and Justice Transformation (HealthandJustice.org). Dr. Rich has advocated for public health policy changes to improve the health of people with addiction, including improving legal access to sterile syringes and increasing drug treatment for the incarcerated and formerly incarcerated populations. Much of his focus currently is on addressing the overdose crisis. Dr Rich is an elected member of the National Academy of Medicine.





## **K. Barry Sharpless, Ph.D.**

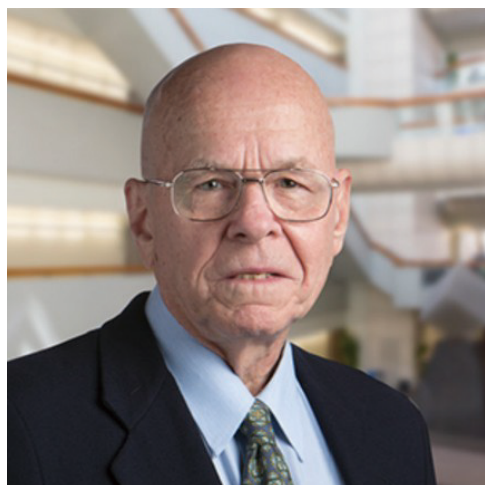
The Scripps Research Institute  
La Jolla, California, USA

<https://sharpless.scripps.edu>

<https://www.nobelprize.org/prizes/chemistry/2001/sharpless/facts/>

<https://www.nobelprize.org/prizes/chemistry/2022/sharpless/facts/>

<https://www.nasonline.org/directory-entry/k-barry-sharpless-mna0kn/>



### **Click Chemistry**

Click chemistry is a modular approach that denotes the development of a set of powerful, highly reliable, and selective reactions for the rapid synthesis of useful new compounds in search of function. This strategy depends largely on using spring-loaded reactants to construct carbon-heteroatom bonds. Click chemistry has many important applications, such as in the fields of chemical synthesis, materials science, chemical biology, and drug development.

### **Accelerating Discovery, Optimization, and Delivery**

Click chemistry was introduced in 1998 as a conceptual framework for functional molecular assembly, emphasizing the importance of carbon-heteroatom linkages in joining modular building blocks with a few nearly perfect reactions. Click reactions were identified as processes that work under operationally simple, oxygen- and water-tolerant conditions, not influenced by pH, temperature, presence of other functional groups and generate products in high yields with minimal requirements for product purification. The goal was to accelerate the process of discovery, optimization, and delivery, especially those in drug discovery, through practical synthesis.

### **Brief bio**

Sharpless received a Ph.D. from Stanford University in 1968. After postdoctoral work, he joined the MIT in 1970. In 1990 he became W.M. Keck Professor of Chemistry at the Scripps Research Institute in La Jolla, California. Sharpless was awarded half of the 2001 Nobel Prize in Chemistry "[for his work on chirally catalyzed oxidation reactions](#)", and one third of the 2022 Nobel Prize in Chemistry "[for the development of click chemistry and bioorthogonal chemistry](#)". Sharpless is the fifth person in addition to two organizations to have twice been awarded a Nobel Prize.





## **Per Thorén, Ph.D.**

Chalmers University of Technology

Gothenburg, Sweden

Molecular Frontiers Foundation

<https://research.chalmers.se/person/thoren>

<https://molecularfrontiers.org/people/94>



Per Thorén earned his PhD in Physical Chemistry at Chalmers University of Technology in 2003. His primary research area is in cellular delivery of macromolecules, but he has also worked on surfactants for solubilization of poorly soluble drugs.

Per Thorén has been a part of Molecular Frontiers since it was formed in 2006, serving for many years as chief operating officer, initiating and managing various outreach projects, including production of educational videos, scientific computer games, science festival activities, and more. Over the years, he has been co-organizer of several Molecular Frontiers Symposia, and part of the team organizing the Molecular Frontiers Inquiry Prize. Between 2010 and 2020, he also worked as communications officer for Chalmers Area of Advance Materials Science.

Since 2022, he is Director of Studies for Chalmers' educational programs in physics.





## **Gregory Winter, Ph.D.**

MRC Laboratory of Molecular Biology and  
Trinity College Cambridge

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<https://www2.mrc-lmb.cam.ac.uk/group-leaders/emeritus/greg-winter/>

<https://www.nobelprize.org/prizes/chemistry/2018/winter/facts/>

[https://en.wikipedia.org/wiki/Gregory\\_Winter](https://en.wikipedia.org/wiki/Gregory_Winter)



### **The thrill of antibodies and their applications**

In recent years monoclonal antibodies (mAbs) have become major pharmaceutical drugs and topped the sales charts. I will explain the origins of the antibody revolution, and the technological innovations that propelled it, including my own work on “humanising” mouse mAbs and making fully human mAbs by phage display technology. I will also explain how I came to be positioned at the origins of this revolution, and the forces that propelled me there, including my work on protein and DNA sequencing, and attempts to understand the origins of enzyme catalysis.

As well describing my career in science, I shall describe how this expanded into other areas as I sought to apply my discoveries, including the patenting of inventions and shaping the licencing policies for their application, and working with clinicians to demonstrate the utility of the inventions and with venture capitalists to found start-up companies based on the inventions. But it all started in academic research—a great springboard for many other careers.

### **Brief Bio**

My career was founded on my expertise in protein chemistry and recombinant DNA technology, and was best known for my research on the development of technologies to make both humanized and human therapeutic antibodies. These technologies helped spawn the field of antibody therapeutics, and were harnessed in the development of the blockbuster drugs Humira, Keytruda, Avastin, and Herceptin among others. I have received several international prizes for my work, including the Prince of Asturias Prize (Spain), the Prince Mahidol Award (Thailand), the Gairdner International Award (Canada) and the Royal and the Copley Medals of the Royal Society (UK). For my application of phage display technology to making human antibodies, including the first human antibody (Humira) approved by the FDA for human therapy, I shared the Nobel Prize in Chemistry in 2018.

I was an undergraduate and postgraduate student at Trinity College, University of Cambridge and my research career has almost entirely been based at the Medical Research Council's Laboratory of Molecular Biology (LMB) in Cambridge, where I became Deputy Director, leaving only in 2012 to become Master of Trinity College, Cambridge. In parallel with my research, I founded three successful start-up companies based on my inventions - Cambridge Antibody Technology (floated in LSE and sold to AstraZeneca), Domantis (sold to GSK) and Bicycle Therapeutics (NASDAQ: BCYC). Retired since 2019, I continue to take an interest in the applications and commercialisation of biotechnology. I am a non-executive Director of Bicycle Therapeutics (NASDAQ: BCYC), which I founded for the development of small bicyclic peptides as antibody mimics; I am also a scientific partner of Ahren Innovation Capital and Trustee of the Hong Kong-based Croucher Foundation.





## **Pernilla Wittung-Stafshede, Ph.D.**

Department of Life Sciences, Chalmers University of Technology,  
Gothenburg, Sweden

<https://www.lindau-nobel.org/member/pernilla-wittung-stafshede/>

<https://www.kva.se/en/contact/pernilla-wittung-stafshede-2/>

<https://molecularfrontiers.org/people/203>



### **Protein folding is the basis of life and death**

Proteins are the workhorses of all living organisms and thus essential for survival. Dysfunction or inactivity of specific proteins is the basis of most human diseases. Proteins are synthesized on ribosomes as long chains of amino acids. To become active, most of these chains need to adopt unique folded three-dimensional structures. All the information for folding is incorporated within the linear chain of amino acids and most proteins fold spontaneously in test tubes. We have thousands of proteins in our cells with different amino acid chains and thereby different folded shapes. Studies during the last decades have provided a lot of knowledge of individual protein folding reactions in test tubes. However, when considering protein folding in the cells of living organisms, additional aspects (such as the crowded environment, metal ion cofactors) need to be considered. After explaining the basics of protein folding and how we study it in the laboratory, I will describe some recent findings from my research group that showcase the importance of studying protein interactions when exploring both cancer and neurodegeneration mechanisms.

### **Brief Bio**

Pernilla Wittung-Stafshede obtained a PhD in Physical Chemistry in 1996 at Chalmers University of Technology, Gothenburg, Sweden. During 1997–1998 she did a postdoc at California Institute of Technology, Pasadena, California. In 1999 she started her independent career as an assistant professor in Chemistry at Tulane University, New Orleans, Louisiana. She received tenure and was promoted to associate professor in 2002. In 2004 she moved to Rice University, Houston, Texas, as associate professor with tenure in the Biochemistry and Cell Biology department. After 5 years, in 2008, Wittung-Stafshede returned to Sweden and became full professor in Chemistry at Umeå University in the north of Sweden. She spent 7 years there before moving to Chalmers in Gothenburg in 2015 to the then newly founded Life Sciences department; there acting as head of the Chemical Biology division for the first three years. Overall, her research is dominated by protein folding/misfolding biophysical studies using an array of biophysical tools. She has made pioneering discoveries around the role of metals in protein folding, macromolecular crowding effects on folding reactions, as well as on mechanisms of copper-transport proteins. Her current focus is directed towards roles of copper transport proteins in cancer and cross-reactivity as a modulator of amyloid formation in neurodegenerative diseases. Wittung-Stafshede has published over 270 peer-reviewed scientific articles and over 50 popular texts.

Wittung-Stafshede was elected to the Royal Swedish Academy of the Sciences in 2016 and to the Royal Swedish Academy of Engineering Sciences in 2020. In 2024, she became an Honorary Fellow of the Royal Society of Chemistry and was elected to the European Academy of Sciences. She has received numerous awards during her career, for example the Arrhenius medal, the IUPAC Distinguished Women in Chemistry and Chemical Engineering Award, and Biophysical Society Fellow. In 2020 she joined the Nobel Prize in Chemistry committee and, 2021, became a member of the scientific council for the Lindau Nobel Laureate meetings. Wittung-Stafshede has trained many young scientists including numerous women and minorities. In 2019, she launched the 10-year gender equality program Genie (Gender Initiative for Excellence) at Chalmers ([www.chalmers.se/genie](http://www.chalmers.se/genie)) which aims to increase research excellence via faculty recruitments and academic cultural/system changes. She was the leader for Genie during the first four years, 2019 to 2022. Today she is a spokesperson for gender equality, in Sweden and internationally, and she often gives seminars on this topic.





## **Yang Huanming, Ph.D.**

BGI-Shenzhen/University of Chinese  
Academy of Sciences

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ORCID: 0000-0002-0858-3410



### **Brief Bio**

Yang Huanming, a member of the [Chinese Academy of Sciences](#) (CAS) and [Chinese Academy of Medical Science](#) (CAMS). He is also a professor at the University of Chinese Academy of Sciences (UCAS) and Peking Union Medical College (PUMC), teaching in many other universities. Furthermore, Yang is former vice-President of the Genetics Society of China and Chinese Society of Biotechnology, President of the Chinese Society for Urban Science Research, and one of co-founders of [Beijing Institute of Genomics](#), CAS (2007), and [BGI-genomics](#) (2002).

Yang has been working on genetics/genomics and relevant fields for many years, and has been engaged in both research and teaching for nearly half a century. Yang and his BGI team, together with collaborators all over the world, have made a significant contribution to the International Human Genome Project (HGP, 1999-2003), the International HapMap Project (HapMap, 2002-2006), International 1000 Genomes Project (G1K, 2008-2012), the International Cancer Genome Project (ICGP, 2008-2010), the international collaborations on Yeast Genome Redesign and Synthesis (Sc2.0, 2011-2017), the Earth Biogenome Project (EBP, 2017-), and other human omics research, as well as sequencing and analyzing genomes of many other animals, plants, and microorganisms, with more than 660 publications in the internationally prestigious journals, including more than 200 in Cell, Science, Nature and its series, and many others, with an H-index=130.

Yang has been elected as a member of European Molecular Biology Organization (EMBO), The World Academy of Sciences (TWAS), and The African Academy of Sciences (AAS), an international/foreign member of the National Academy of Sciences of Germany, India, Ukraine, the United States and the Royal Danish Academy of Sciences and Letters.





## **Zhang Feng, Ph.D.**

Investigator, Howard Hughes Medical Institute

Core Member, [Broad Institute of MIT and Harvard](#)

Investigator, [McGovern Institute for Brain Research](#), MIT

James and Patricia Poitras Professor in Neuroscience, MIT

Departments of Brain and Cognitive Sciences and Biological Engineering, MIT  
Cambridge, Massachusetts

[Cong, L. et al. \(2013\). Multiplex genome engineering using CRISPR/Cas systems. Science. 339\(6121\):819-23.](#)

[Strecker, J. et al. \(2019\) RNA-guided DNA insertion with CRISPR-associated transposases. Science. 365\(6448\):48-53.](#)

[Zhang F. Development of CRISPR-Cas systems for genome editing and beyond. Quarterly Reviews of Biophysics \(2019\).](#)



### **Exploration of Biological Diversity**

Many powerful molecular biology tools have their origin in nature, and, often, microbial life. From restriction enzymes to CRISPR-Cas9, microbes utilize a diverse array of systems to get ahead evolutionarily. We are interested in exploring this natural diversity through bioinformatics, biochemical, and molecular work to better understand the fundamental ways in which living organisms sense and respond to their environment and ultimately to harness these systems to improve human health. Building on our demonstration that Cas9 can be repurposed for precision genome editing in mammalian cells, we began looking for novel CRISPR-Cas systems that may have other useful properties. This led to the discovery of several new CRISPR systems, including the CRISPR-Cas13 family that target RNA, rather than DNA. We developed a toolbox for RNA modulation based on Cas13, including methods for precision base editing. We are expanding our biodiscovery efforts to search for new microbial proteins that may be adapted for applications beyond genome and transcriptome modulation, capitalizing on the growing volume of microbial genomic sequences and building on our bioengineering expertise. We are particularly interested in identifying new therapeutic modalities and vehicles for delivering cellular and molecular cargo. We hope that this combination of tools and delivery modes will accelerate basic research into human disease and open up new therapeutic possibilities.

### **Brief Bio**

Dr. Zhang is a molecular biologist focused on improving human health. Current research in the Zhang laboratory is centered on discovering and characterizing novel biological systems and developing them into molecular tools and therapies to study and treat human diseases. Zhang is a core member of the Broad Institute, an Investigator at the McGovern Institute for Brain Research, the James and Patricia Poitras Professor of Neuroscience at MIT, and a Howard Hughes Medical Investigator.





## Zhao Bowen

Founder and CEO of QuantiHealth

<https://quantibio.com/us/en/about/>

<https://www.technologyreview.com/innovator/bow-en-zhao/>

<https://www.youtube.com/watch?v=etJVSup8tQI>

<https://www.nature.com/articles/s41587-021-00941-4>

<https://time.com/collection/next-generation-leaders/3270901/zhao-bowen-next-gen-leaders/>

<https://www.forbes.com/30-under-30-asia-2016/healthcare-science/#4edbae4425f9>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5756770/>



### Brief Bio

Zhao Bowen is the founder and CEO of **QuantiHealth Co., Ltd.**, a Beijing based company focusing on microbiome research and development of live biotherapeutic products (LBPs), which provided sequencing and bioinformatics analyses for more than 100 research organizations, participated in 300+ research projects, trained 100+ disease models, constructed and hosting the largest human microbial seed bank with 100,000+ nonredundant strains, with 200+ novel species discovered in the past 10 years. QuantiHealth is also a decent provider of high quality next-generation probiotics, providing OEM/ODM service for the industry.

Zhao started his career as a high school drop-out working for **Beijing Genomics Institute (BGI)**, Shenzhen in 2009. He led a team of researchers trying to unveil the genetic basis of human cognitive ability variance, founded and directed **Cognitive Genomics Laboratory**, a key laboratory in Shenzhen, China in 2010. He moved to the field of microbiome research in 2013, before founding his own company in 2014.

Zhao is by far the youngest TR35 nominee (2013 Innovators under 35 by **MIT Technology review**). He was also awarded with “Next Generation Leaders” by **TIMES**, “40 under 40” by Fortune, “30 under 30” by **Forbes**, and “Biotech Leaders” by **Nature Biotechnology**, etc.

<https://www.nature.com/articles/s41587-021-00941-4>

Zhao and his team have published more than 40 articles in the field of microbiome research, and he still works as the chief scientist of QuantiHealth until now.







## Zhang Shuguang, Ph.D.

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<https://molecularfrontiers.org/people/114>

Zhang S. et al. (2018) QTY code enables design of detergentfree chemokine receptors that retain ligand-binding activities. [Proc. Natl. Acad. Sci. USA 115 \(37\) E8652-E8659. PMID: 30154163](#)

Zhang S. & Egli M. (2022) Hiding in plain sight: three chemically distinct  $\alpha$ -helix types. [Quarterly Review of Biophysics \(QRB\) 55, e7. PMID:35722863](#)

Qing R. et al (2023) Scalable biomimetic sensing system with membrane receptor dual-monolayer probe and graphene transistor arrays. [Science Advances 9\(29\):eadf1402. doi: 10.1126/sciadv.adf1402. PMID: 37478177.](#)

Li M. et al (2024) Design of a water-soluble transmembrane receptor kinase with intact molecular function by QTY code. [Nature Communications 15\(1\), 4293. PMID: 38858360.](#)



### The QTY code for membrane protein engineering

Zhang Shuguang in 2011 conceived a simple [QTY code](#) to design water-soluble membrane proteins. There are ~26% genes that code for membrane proteins in human genome which are crucial for both internal and external cellular communications. The simple molecular [QTY code](#) is based on two key molecular structural facts: 1) all 20 amino acids are found in naturally occurring alpha-helices regardless of their distinct chemical properties: (i) hydrophilic, (ii) hydrophobic and (iii) amphiphilic; 2) several amino acids share striking structural similarities despite their different chemical properties; for example, Leucine (L) vs glutamine (Q); Valine (V) and Isoleucine (I) vs Threonine (T); and Phenylalanine (F) vs Tyrosine (Y). Using the simple QTY code, we replace ~50% hydrophobic amino acids L, I, V, F in transmembrane alpha-helices with hydrophilic amino acids Q, T, Y. The water-soluble QTY variants still maintain the stable structures and ligand-binding activities in the chemokine receptors, and 4 enzymatic functions of bacterial histidine kinase. The [AphlaFold2](#) predictions proved the [QTY code](#) validity. The simple QTY code is a likely useful tool and has big impact on designs of watersoluble variants of previously water-insoluble GPCRs, glucose transporters, solute carrier transporters, ABC transporters, potassium ion channels, beta-barrel outer membrane proteins and monoclonal antibodies. The [AphlaFold2](#) and [AlphaFold3](#) predictions proved the QTY code usefulness. The simple [QTY code](#) is a likely useful tool for designs of water-soluble variants for diverse applications.

### Brief Bio

Zhang Shuguang is at MIT Media Lab, Massachusetts Institute of Technology. His current research focuses on designs of biological molecules, particularly proteins and peptides. He received his B.S from Sichuan University, China and Ph.D. in Biochemistry & Molecular Biology from University of California at Santa Barbara, USA. He was an American Cancer Society Postdoctoral Fellow and a Whitaker Foundation Investigator at MIT. He won a 2006 Guggenheim Fellowship and spent academic sabbatical in University of Cambridge, Cambridge, UK. He won 2006 Wilhelm Exner Medal of Austria. He was elected to Austrian Academy of Sciences in 2010, elected to US National Academy of Inventors in 2013, and to the European Academy of Science and Arts in 2021. He won the 2020 Emil Thomas Kaiser Award from the Protein Society. He received the 2024 Eva and George Klein Medal of the Karolinska Institute, Stockholm, Sweden. He has published over 200 scientific papers that have been cited over 40,300 times with a h-index 96. He is also a board member of Molecular Frontiers Foundation.





## *Molecular Frontiers Symposium Sponsors*

### **Chen Ping**

Founding Partner of Ausvic Capital

<https://ausviccapital.com/en/>

<https://ausviccapital.com/en/about/>



#### **Profile:**

Mr. Chen is the founder of Ausvic Capital. He graduated from Cheung Kong Graduate School of Business in 2006 and immigrated to Hong Kong in 2009. Since 2013, Mr. Chen has focused on investments in the technology sector, particularly in the U.S. and European markets. He has identified and backed high-tech companies with disruptive potential globally, driving the development of frontier deep tech.

#### **Investment Scope:**

Mr. Chen's investment areas cover a wide range of high-tech fields, including the digital economy, artificial intelligence, biotechnology, robotics, and space technology. His deep understanding of these areas and extensive investment experience have enabled him to play an important role in driving technological advancement and innovation. His portfolio includes several companies that have achieved remarkable success in their respective fields. Many of these early-stage investments have successfully advanced to unicorn status or IPOs, including CertiK, Dfinity, Circle, MicroConnect, and Navitas.

#### **International Relations:**

Mr. Chen holds events and sponsors student-run ventures at many of the world's top universities (e.g., MIT, Stanford, UC Berkeley) and maintains extensive connections with leading U.S. business families (e.g., the Bezos family in the U.S., the Noble family in Europe, and the Lin family of Taiwan's Quanta Group). These relationships not only provide him with solid support and invaluable resources for international technology investments and collaborations but also enable him to participate



at the forefront of global technology innovation. He is frequently invited to share his insights and experiences at international academic and business forums.

Recently, Mr. Chen's family has established companies with the Noble family in California, Boston, and New York, and has founded a talent membership club for individuals with an IQ of 140 or above to support the rapid growth of gifted youngsters and to build a better future for mankind. For more details, please visit the website: <https://www.nobeldao.com>.

Mr. Ping Chen is a member of the Hong Kong Jockey Club and the initiator of BIOHK, one of the most authoritative biotech conferences in Asia (the exhibition is co-founded by Ausvic Capital, the Hong Kong Biotechnology Organization, and The BayHelix Group). He also serves as the Permanent Honorary Chairman of the Hong Kong Biotechnology Association.





## **Jun Chen, Ph.D.**

Founder and CEO of Goldport Capital

CEO of Synsea Biopha

<http://www.goldportcap.com/>

### **Profile:**

Dr. Jun Chen is the Founder and CEO of Goldport Capital, the CEO of Zhejiang Synsea Biopha, and the Founder of the Capital Market Research Center of Zhejiang University. He is a senior well-recognized investor in the high-tech field in China, and also has rich experiences in business incubation and management. Dr. Chen received his Ph. D. in Economics from Wuhan University, MBA from MIT Sloan School of Management, master in Management Engineering and bachelor in Chemical Engineering from Zhejiang University. He has won numerous honors in venture capital field in China including "Top 30 China's Best Angel Investors" by the VC Foundation, "Top 50 China's Outstanding Innovative Investors" and "Top 20 Chinese Healthcare Investment Figures" by Financing China.



### **Investment Scope:**

Dr. Chen has long-term in-depth research and tracking of global value chains including health care, new energy, and information technology. He led and participated in the investment of over 100 companies. His portfolios incubated and connected a lot innovation and entrepreneurs around very innovative centers especially Singapore, Toronto, Boston, Shenzhen and Tokyo. He believes that health is the ultimate pursuit of humanity and especially focuses on health care investment including innovative drugs, drug delivery, medical apparatus and instruments, etc. His representative projects include HRYZ Bio., Sciencare Medical, Harbour BioMed, MicroTech Medical, Oryza, Yuanxing Gene, Synsea Biopha, iTaeQ, etc. Many of these early-stage investments have successfully grown up into big companies or IPOs in China.





## **Marina Chan**

Executive Director

MIT Hong Kong Innovation Node

Hong Kong

<https://hkinnovationnode.mit.edu>

<https://hkinnovationnode.mit.edu/about/team/>

<https://hkinnovationnode.mit.edu/programs/mitia/>



Marina Chan oversees educational activities for learners across secondary, tertiary and professional education. Leveraging on innovation best practices developed by MIT, Marina spearheads efforts to foster the entrepreneurial mindset through the venture creation process. Her work includes helping teachers integrate technology to create student-centered, inquiry-based learning environments, and building career-ready skills for young people. Prior to joining MIT Node, Marina worked at Merrill Lynch as vice president of client management in the Asian equity business where she earned her CFA charter. Previous to that, she began her career at Nortel Networks. Marina serves on the board of Hong Kong Red Cross schools and was a member of the Dean's Leadership Council at the Harvard Graduate School of Education. She holds a master's degree in education from Harvard University and a bachelor's degree in finance from McGill University.





## **Wang Yang, Ph.D**

Vice-President for Institutional Advancement  
Chair Professor, Department of Mathematics &  
Department of Industrial Engineering and Decision  
Analytics

The Hong Kong University of Science and Technology

<https://hkust.edu.hk/senior-adm/vice-president-for-institutional-advancement>

Prof. Wang Yang is the Vice-President for Institutional Advancement of The Hong Kong University of Science and Technology (HKUST). He is also a Chair Professor of Mathematics & Industrial Engineering and Decision Analytics. He joined HKUST as the Head of the Department of Mathematics in 2014 and he became the Dean of School of Science in 2016.

Prof. Wang is an internationally respected scholar with wide ranging research interests, having published over 150 research journal papers in both pure and interdisciplinary mathematics, many of which in top journals. During his tenure as Dean of Science and Head of Mathematics, Prof. Wang founded the HKUST Big Data Institute and launched the popular Big Data Technology MSc program.

Prof. Wang received his Bachelor degree in Mathematics from the University of Science and Technology of China in 1983 and obtained his PhD degree in Mathematics from Harvard University in 1990. He started his academic career with the Georgia Institute of Technology in 1989 and then moved on to be the Department Chair and Professor of Mathematics at Michigan State University in 2007. He was also a Program Director at the National Science Foundation in the US between 2006 and 2007.



HKUST is a world-class university that excels in driving innovative education, research excellence, and impactful knowledge transfer. With a holistic and interdisciplinary pedagogy approach, HKUST was ranked 3rd in the Times Higher Education's Young University Rankings 2024, while 12 of its subjects were ranked among the world's top 50 in the QS World University Rankings by Subject 2024, with "Data Science and Artificial Intelligence" being ranked first in Hong Kong and 10th in the world. The graduates are highly competitive, consistently ranking among the world's top 30 most sought-after employees. In terms of research and entrepreneurship, over 80% of our work was rated "Internationally excellent" or "world leading" in the latest Research Assessment Exercise 2020 of Hong Kong's University Grants Committee. As of June 2024, HKUST members have founded 1,747 active start-ups, including 10 Unicorns and 14 exits (IPO or M&A).





## Jay Dong, Ph.D.

Founder and CEO, UltraDx Bio  
Shanghai, China

<https://www.prnewswire.com/news-releases/a-small-step-towards-a-big-mission-worlds-first-ultradx-received-first-clinical-approval-of-single-molecule-analyzer-in-china-302239416.html>

<https://www.biospace.com/press-releases/a-small-step-towards-a-big-mission-worlds-first-ultradx-received-first-clinical-approval-of-single-molecule-analyzer-in-china>

<https://www.biospectrumasia.com/news/48/24846/ultradx-receives-first-clinical-approval-of-single-molecule-analyzer-in-china.html>



Jay Dong is Founder and CEO at UltraDx Bio, an ARCH Venture and GF HK portfolio company with a current focus on Alzheimer's Disease early diagnosis, empowered by single molecule array precision detection technology (QTRX SIMOA) and now with world's first clinical approval certification for commercialization.

He started his career as a researcher and R&D scientist at Tufts University Medical Center and LeukoSite/Millennium Pharmaceuticals in the Boston area. For the last twenty years, Jay successfully transitioned into business, marketing, commercialization as a marketing and business leader with Becton Dickinson (BD) Bioscience in the United States and in Singapore, and then, as the founding General Manager of China/Asia Pacific and Global VP of CST, built the company from scratch to a "golden standard" in the industry.

He earned an M.B.A from MIT, an M.A. from Tufts Fletcher, Master of Medicine from Peking Union Medical College (Tsinghua University Faculty of Medicine). Jay is a recognized business leader in the industry and community leader in Asia, with voluntary social responsibilities including serving as the president of MIT Club of Shanghai and Vice Chairman of BayHelix Group.





## Chris Howard, Ph.D.

MIT Entrepreneurship Psychologist, Multi Exit Startup Founder,  
Casual Investor, Tech-stars,  
The Rattle, NEOM, MassChallenge  
Reading, UK

<https://www.linkedin.com/in/iamanoptimist/>

[https://www.downthegardenpath.xyz/crowdfundin\\_g-review-violet-a-smart-home-dashboard-for-all-your-devices/](https://www.downthegardenpath.xyz/crowdfundin_g-review-violet-a-smart-home-dashboard-for-all-your-devices/)



Chris Howard earned a Ph.D in Computational Physics, and conducted postdoctoral research at MIT in Behavioural Psychology. Chris was the Head Teaching Fellow at Harvard University.

Dr. Howard has become a persistent figure in the startup and entrepreneurial ecosystem across the UK and USA. He specializes in fusing psychology, graph science, and entrepreneurship together to solve complex and 'left field' problems. He has cofounded and led multiple companies, achieved three successful exits, one horrible failure, one Hollywood thriller of a startup, and a handful of "still going very strong" early companies. He has raised over \$100M in startup capital -smallest \$70K, largest \$23M. He also developed and nurtured some pretty cool startup ecosystems - Techstars, The Rattle, MassChallenge - and taught/researched at 3 of the top 10 universities in the world - Harvard, MIT, UCL.

Dr. Howard built one of the world's most celebrated accelerators. He launched one of the largest Web3 projects of 2022 and raised 16 rounds of venture capital totaling \$40M. He has written about 100,000+ lines of code and shipped about 10 unique products. He has made some great investments and had some misfires – 20 in all with his own money. He is very good at fundraising because he takes the time to understand the \*psychology\* of investors. He was a professor once and taught entrepreneurship, until he felt that true entrepreneurship can only be practiced – not taught. He considers himself as one of the OG inventors of the "Venture Builder" phenomena. 'For me, being a founder is both my career path and my lifestyle – allowing me to learn an enormous number of rare skills and help others avoid pitfalls undeserving of their originality.'





## Luo Zhongli Ph.D.

Professor, Chongqing Medical University  
Founder and President, Chengdu Sciobio  
Biotechnology Co.Ltd.

Founder and President, Chengdu Sciobio  
Surgery Institute. Cooperative-partner, ARHC  
Health International (Macau) Co.Ltd.

Cooperative-partner, Guangdong Hengqin  
ARHC Biotechnology Co.Ltd.

Cooperative-partner, Sichuan Bioceutix  
Science Co., Ltd. Cooperative-partner,RSI  
Consultants Suzhou.

E-Mail: [Zhongliluo@163.com](mailto:Zhongliluo@163.com).

<https://basic.cqmu.edu.cn/info/1025/1441.htm>



Professor Luo Zhongli is a professor at the College of Basic Medical Sciences & Molecular Medicine and Cancer Research Center at Chongqing Medical University in China. He earned his Ph. D. under the guidance of Zhang Shuguang (MIT) in Biochemistry & Molecular Biology from Sichuan University, Chengdu, China. He published more than 50 papers in energy engineering and nano-biotechnology from designer chiral self-assembling peptides (cSAP). He also pursues membrane protein biochemistry, nanomedicines to clinical applications, and wound healing and tissue engineering in biomedical areas. His studies are supported by the Natural Science Foundation Project of CQ CSTC and National Natural Science Foundation of China (NSFC). He was a postdoctoral fellow under the guidance of Prof. Bengt Nordenf at Chalmers University of Technology, Gothenburg, Sweden.

Luo Zhongli is a cofounder of the Sciobio Surgery Institute of Chengdu. He funded Chengdu Sciobio Biotechnology Co., Ltd., invented numerous technologies including more than 10 patents. He is also Co-partner to ARHC Health International (Macau) Co., Ltd., Guangdong Hengqin ARHC Biotechnology Co.Ltd., Sichuan Bioceutix Science Co., Ltd., and RSI Consultants Suzhou. His broad cross-cultural experience and active involvement in both the academic and business create an extensive international network and contacts in China and other countries. Sciobio Surgery Institute of Chengdu (SSIC) is a non-profit organization established in 2018, which has been authorized to become a chapter of Molecular Frontiers Foundation in 2022. One of his mission is to establish and facilitate a worldwide platform for the world biotech, health and clinical medicine industry, support innovative research projects, promote international collaboration and provide valuable patents to business.

**SCIOOIO** 赛恩贝



**BIOCEUTIX**  
铂修生物

**RSI**  
裕新国际  
RSI International







## **Pan Pengkai, Ph.D.**

Angel Investor and Incubator

<https://www.linkedin.com/in/drpan>

<https://www.alo7.com/en/>

<https://www.intag.cn/en-US/>



Dr. Pan Pengkai is a globally recognized AI expert with a Ph.D. from the MIT Media Lab in 2004. During his doctoral studies, he developed one of the world's first video "collaborative filtering" algorithms, laying the groundwork for modern online video recommendation systems. With extensive entrepreneurial experience in AI education, he has founded multiple companies, raised nearly \$100 million in venture funding, and spearheaded the growth of a multibillion-dollar industry cluster. One of his ventures, ALO7, stands as China's largest provider of AI-driven English learning content and online tutoring, benefiting over 20 million students. Dr. Pan also holds numerous software copyrights and patents. Currently, he serves as an angel investor and incubator for several AI startups, including [Intag Bioscience](#), which has developed the smallest and fastest \$100 PCR machine, and Apply7.ai, an AI-agent-powered college application marketplace.





## Qi Yuan, Ph.D.

Fudan University, Shanghai

<https://www.fudan.edu.cn/en/About/main.htm>

<https://stcsm.sh.gov.cn/news/20240611/bea5175d555c4031ab4b26210d279cde.html>



Qi Yuan is a distinguished AI leader in both academia and industry. He obtained Ph.D. from MIT and was a research fellow of MIT CSAIL and Whitehead Institute. He was tenured associate professor of Purdue University, and visiting professor of Columbia University, Duke University and Brown University. He joined Alibaba in 2014 as VP and then Chief AI Scientist of Ant Group. He developed core AI platforms and products for Alibaba and Ant Group, including Alibaba Cloud's AI training and deployment platform PAI, Ant Group's graph neural network platforms, and the privacy computing platform YINYU with various important applications such as risk management, credit scoring, intelligent insurance claims, recommendation systems, intelligent customer services and digital assistant. In 2021 he joined Fudan University and developed Fuxi weather foundation models; Fuxi 2.0 is the first AI system in the world for sub-seasonal weather forecast. In 2022 he founded INF which develops an open LLM training and deployment platform and trustworthy foundation models and applications in financial areas.

He served as associate editor of *Journal of Machine Learning Research*, area chairs and committee members of top AI and computational biology conferences such as ICML, NeurIPS, UAI, AISTATS, and ISMB. He received Newton Breakthrough Research Award from Microsoft and the US NSF CAREER award. His work has been reported by *MIT Technology review*, *Economist* and Harvard Business School.





**Xu Wei, MD., Ph.D.**

METiS Pharmaceuticals

<https://www.metispharma.com/en>

<https://www.metispharma.com/en/about>



Xu Wei is the chief scientific officer at METiS Pharmaceuticals, where he executes the overall discovery pipeline strategy. He has more than 15 years of experience in the pharma industry focusing on the immunotherapy drug discovery and translational research in multiple therapeutic modalities such as antibody-based therapeutics, cellular, and gene therapy. Prior to joining METiS, he was the chief scientific officer at Numab Therapeutics in Switzerland. Prior to Numab, he was the VP of Innovent Biologics where he headed three functions, namely biology, translational medicine and cell therapy. From 2012 to 2018, he was a group leader of Oncology Discovery at Roche where he delivered 4 new medical entities (NMEs) from lab research to the clinical development. He has contributed to more than 20 high-impact publications and obtained more than 20 patents. He earned his PhD in Immunology from Leiden University, the Netherlands.





## **Albert Cheung Hoi Yu, Ph.D., JP**

Professor, Peking University  
Founder and Chairman, Hong Kong  
Biotechnology Organization  
Founder and President, Guangdong-Hong  
Kong-Macau Great Bay Area  
Biotechnology Alliance  
Biotech Advisory Panel, The Stock  
Exchange of Hong Kong Limited  
Board of Trustees, Gordon Research  
Conference  
Founder and Chairman, Hai Kang Life  
Corporation Limited  
<https://www.hkbio.org.hk/index.php/en/>



Professor Albert Cheung Hoi Yu received his PhD from the University of Saskatchewan, Canada and spent subsequent years in UCSF, Stanford, HKUST and Peking University. Professor Yu is a world-renowned bio-entrepreneur and scientist with over 30 years of experience in the field of neuroscience and molecular diagnostics. He has published over 170 scientific papers and 14 books. He founded HKLife and invented numerous technologies including 76 global patents. Professor Yu created the BioRadar® system, which aims to accelerate the development of precision medicine and guide treatment. His broad cross-cultural experience and active involvement in both the academic and business create an extensive global network and contacts in China. He is now an important facilitator of dialogue regarding the development of biotechnology in Asia, putting Hong Kong onto the global biotechnology map. Recently, he pushes forward a major international biotech convention-BIOHK, so as for all of us to have a global biotech platform in Asia to showcase our accomplishments, exchange ideas, trade our products, fundraising, and more.



The Hong Kong Biotechnology Organization (HKBIO) is a non-profit organization established in 2010 by reputable industry and esteemed academic representatives. Its mission is to establish and facilitate a worldwide platform for the Hong Kong biotech industry, promote awareness, encourage and enable international collaboration and provide technical advice and an informed opinion to government bodies, health care institutions as well as the general public. HKBIO has organized and sponsored several successful events in the past to highlight the potential of Hong Kong's biotechnology industry.

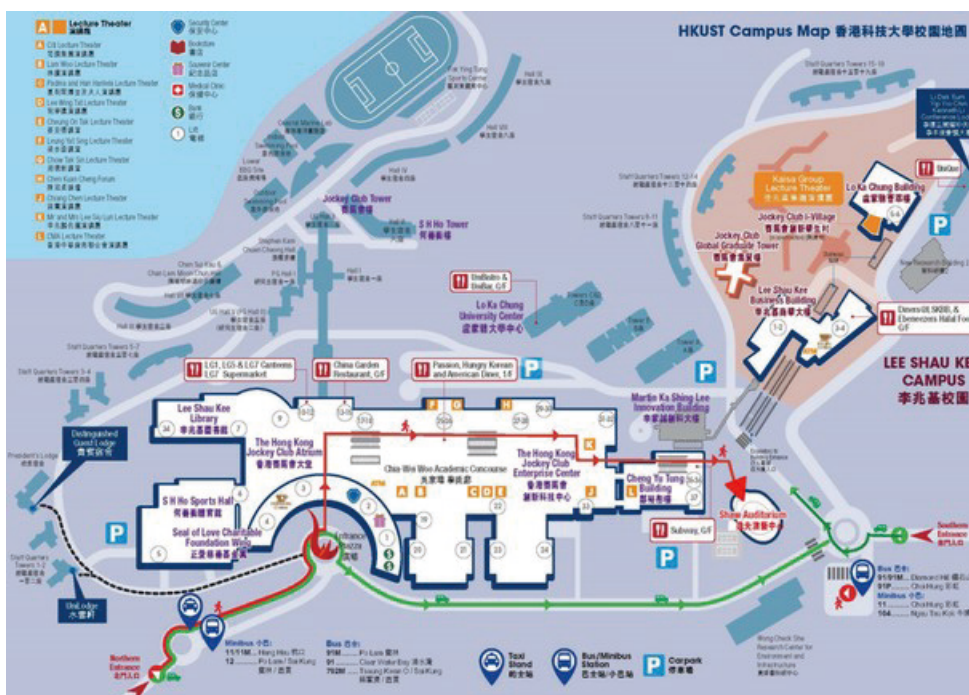




# Venue



The symposium will be held at Main Hall, Shaw Auditorium, The Hong Kong University of Science and Technology.



The complete HKUST map is available at:  
[http://publish.ust.hk/univ/maps/Campus\\_Map\\_Color.pdf](http://publish.ust.hk/univ/maps/Campus_Map_Color.pdf)



# Venue



MTR Route Map:

<https://www.mtr.com.hk/en/customer/jp/index.php>

MTR Stations with bus or green minibus service to HKUST 提供往科大巴士或綠色專線小巴服務的港鐵車站
Diamond Hill 鑽石山:  91, 91M, 91P*
Choi Hung 彩虹:  91, 91M, 91P*  11, 11S#
Ngau Tau Kok 牛頭角:  104
Tiu Keng Leng 調景嶺:  792M
Hang Hau 坑口:  91M  11, 11M, 11S#
Po Lam 寶琳:  91M  12, 11S#
Tseung Kwan O 將軍澳:  792M

#### Transportation from airport to HKUST:

For passengers with bulky luggage, taking a taxi to HKUST direct is recommended. Those with simple luggage may take Airport Bus A22 to Lam Tin MTR station or A29 to Po Lam MTR station, and change for taxi to HKUST.

#### Bus Routes 巴士路線

#### Green Minibus Routes 綠色專線小巴路線

\* Departing from Diamond Hill Station at 07:55 – 08:50 to North Bus Station (HKUST) Monday to Friday (except Public Holidays)  
星期一至星期五 (公眾假期除外), 於07:55至08:50由鑽石山鐵路站前往北門巴士站 (香港科技大學)

# Departing from Po Lam (Public Transport Interchange) at midnight 12:00 to 05:00 to North Bus Station (HKUST)  
午夜12:00至05:00由寶琳 (公共交通交匯處) 前往北門巴士站 (香港科技大學)

## Bus and Minibus Route





# *Accommodation Arrangements*



Guests will stay at the [Li Dak Sum Yip Yio Chin Kenneth Li Conference Lodge](#) of The Hong Kong University of Science and Technology during the symposium.

Address: Li Dak Sum Yip Yio Chin Kenneth Li Conference Lodge, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong  
Tel: +852 3701 8888





## *Additional*

### **Crowne Plaza Hong Kong Kowloon East**

Address: Tower 5, No. 3 Tong Tak Street, Tseung Kwan O

Price: HKD1,800-2,200 per night

### **The Pier Hotel**

Address: No.9 Pak Sha Wan Street, Sai Kung

Price: HKD1,700-1,900 per night

### **Camlux Hotel**

Address: 15 Wang Kwong Road, Kowloon Bay

Price: HKD1,350 per night

### **Holiday Inn Express Hong Kong Kowloon CBD2**

Address: 97 How Ming Street Kwun Tong, Kowloon

Price: HKD1,450-1,500 per night

### **Hotel COZI Harbour Vie**

Address: 163 Wai Yip Street, Kwun Tong

Price: HKD700-800 per night

## *Dining and Banquet Arrangements*

November 15 Banquet: hosted by Ausvic Capital and HKBIO

Location: China Club

November 16 Banquet: hosted by the MIT Alumni

Location: WM Hotel Hong Kong

November 17 Banquet: hosted by Sciobio, ARHC, Bioceutix and RSI

Location: UniQue, Li Dak Sum Yip Yio Chin Kenneth Li Conference Lodge

Breakfast for guests from November 15 to 17 will be arranged by the hotel.

Lunch for guests from November 15 to 17 will be arranged by

The Hong Kong University of Science and Technology and Ausvic Capital.

Participating students will receive meal vouchers on-site from the university, and dinner will be on their own arrangement.

Website: <https://molecularfrontiers.org/>







***Previous symposia and biotech conferences organized by Chen Ping and colleagues***  
***2019 Hong Kong Stock Exchange Biotech Week – Nobel and Turing Laureates Hong Kong Summit***



The HKEx Biotechnology Week 2019 was jointly hosted by HKEx, Greater Bay Area Homeland Investments Limited and Ausvic Capital. The guests included Carrie Lam (Chief Executive of HKSAR), Paul Chan Mo-po (financial Secretary of HKSAR), Charles Li (Chief Executive of HKEx), Chen Ping, (Founding Partner of Ausvic Capital) as well as Nobel Prize winners and Turing prize winners. We have jointly organized international activities with HKEx to fully demonstrate the strength of our fund.





## *2018 Nobel Heroes Day – Hong Kong Summit*



Ausvic has held the “Nobel Heroes Hong Kong Summit” in 2018. It is an annual grand meeting between Nobel laureates and Hong Kong elites from all walks of life, providing a better platform for the economic development, scientific and technological innovation of Hong Kong SAR and Mainland China. As the organizer of the conference, Ausvic Capital has established contacts with world-renowned scholars and institutions from Nobel Foundation, Lindau Nobel Laureate Meetings (LNLN), and Heidelberg Laureate Forum. We have established the popularity of Ausvic Capital, and we will explore in-depth cooperative relationships in the future.





# *Nobel Family Members' Visit to Hong Kong and the Establishment of a Platform for Top-Tier Intellectuals in Hong Kong*





*We gratefully acknowledge these sponsors' generous contributions to the Molecular Frontiers Symposium*



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THE HONG KONG  
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AND TECHNOLOGY



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GOLDPORT CAPITAL



AUSVIC  
Capital



Hong Kong  
Innovation Node



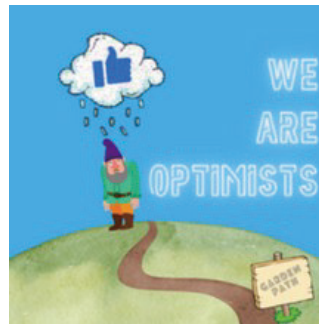
Quanti  
Health



Hong Kong Biotechnology Organization  
香港生物科技協會



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PHARMACEUTICALS



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RSI International



UltraDx Bio  
To Make the World a healthier Planet



上海科学院  
Shanghai Academy of Artificial Intelligence for Science



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