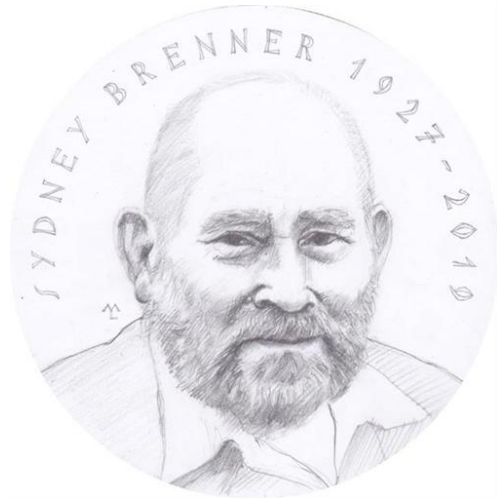




The 2025 Sydney Brenner Prize of the Academia Europaea



The Academia Europaea are pleased to award **A SYDNEY BRENNER** Medal for achievements in the Life Sciences, to

Professor MARKUS RALSER MAE

Einstein Professor of Biochemistry, Charite Universitätsmedizin Berlin.

The medal is given to honour the best in scholarship and personal achievements within a period of not more than 20 years after obtaining the PhD degree (with allowance for career breaks). The award is given to an individual scholar in the field of molecular biology and related disciplines. The Medal is awarded at the Annual Conference of the Academy and on that occasion the recipient will deliver a 'Sydney Brenner' lecture

The Academia Europaea Sydney Brenner Medal was established in 2022 to commemorate Sydney Brenner, one of the greatest scientists of the 20th century and one of the founding members of the Academia Europaea.

Professor Ralser will receive the medal and will deliver the accompanying lecture at the annual conference of the Academia Europaea, Munich, on October 16th, 2025.

Lecture title: ***"The Dynamic Nature of Cellular Metabolism "***

Abstract: Cellular metabolism comprises hundreds of biochemical reactions running concurrently, many of which interact and interfere with each other. This situation constrains function and dynamics of cellular metabolism, which constantly adapts, for maintaining cellular and organismal viability and growth. Increasing evidence indicates that evolution has harnessed these

metabolic fluctuations to facilitate cellular sensing, signaling, and the management of stress responses.

In this lecture, I will outline our research aimed at identifying the mechanistic principles underlying metabolic organization in and between cells. First, I will briefly discuss our studies on the non-enzymatic origins of metabolism on the early Earth, and highlight the persistence of these ancient metabolic traces within modern metabolism. Next, I will present findings from systematic perturbation experiments, primarily conducted in yeast, designed to elucidate general principles governing metabolic functions, such as those that give us answers on why reactions can co-function despite interfering with each other, and those that allow cells to share metabolites, despite the risk of losing exported metabolites to cheating cells. Finally, I will conclude by going into details of a recent research, where by employing experimentally determined and deep learning predicted enzyme structures, we investigated how metabolic constraints have influenced protein structural evolution across hundreds of millions of years.

Brenner Medal Citation

Professor Dr Markus Raiser has been awarded the 2025 Brenner medal in recognition of his transformative contributions to the field of biochemistry, contributions that profoundly embody the pioneering spirit and scientific vision of Sydney Brenner.

Professor Raiser is internationally regarded as one of the leading scientists in the field of cellular metabolism. He currently leads the Department of Biochemistry at Europe's largest Medical University and acts as Chief Scientific Officer of the Start Up company Eliptica. Ltd. His work has led to fundamental discoveries that have reshaped our understanding of how metabolic networks function, evolve, and regulate life at the molecular level. In the finest tradition of Brenner's legacy, Raiser's research combines conceptual clarity with technological innovation, producing insights of both theoretical depth and practical relevance.

Among his most seminal achievements is the discovery of self-regulating metabolic pathways - a mechanism through which cells rapidly respond to stress via direct chemical modification of enzymes, bypassing slower signalling cascades. This paradigm-shifting insight has profound implications for understanding cellular adaptation, microbial resistance, and cancer biology. Equally remarkable is Raiser's work on evolution of metabolism. This work not only advances the field of evolutionary biochemistry but also reopens foundational questions about the origins of life - a subject of enduring fascination for Sydney Brenner. Many of Raiser's achievements stem from his pioneering the integration of biological data science, functional metabolomics and proteomics with systems biology. His ability to unite high-throughput experimentation with mechanistic insight has enabled a new generation of clinical tools and diagnostic approaches, reflecting a commitment to both discovery and application.

In every respect, Prof. Markus Raiser exemplifies the values that defined Sydney Brenner's legacy: bold inquiry, methodological rigor, cross-disciplinary synthesis, and a relentless drive to answer biology's most fundamental questions. For these reasons, and for his outstanding contributions to biochemistry, molecular biology, and evolutionary science, the Board of trustees of the Academia Europaea are pleased to record Markus Raiser as a most deserving recipient of the Sydney Brenner Medal.

General biography

See: https://biochemie.charite.de/en/metas/person/person/address_detail/prof_dr_markus_raiser

Short synopsis

- 2018 Einstein Professor of Biochemistry, Head of Department, Charité University Medicine, Berlin, Germany

- 2015 Group leader, Francis Crick Institute, London, UK
- 2013 Group leader, Medical Research Council National Institute for Medical Research, London, UK
- 2011 Group leader, Department of Biochemistry, University of Cambridge, UK
- 2007 Junior group leader, Max Planck Institute for Molecular Genetics, Germany
- 2006 PhD in Genetics and Molecular Biology, University of Salzburg Austria, and Max Planck Institute for Molecular Genetics, Germany

Markus was born in South Tyrol (Italy), he studied Genetics and Molecular Biology in Salzburg (Austria), and completed a PhD in neurodegenerative disorders at the Max Planck Institute for Molecular Genetics in Berlin (Germany). After being trained in mass spectrometry at VU Amsterdam (Netherlands), he started a Junior group at the Max Planck Institute for Molecular Genetics, which he eventually moved to the University of Cambridge (UK) in 2011. Markus then has been a group leader at the Francis Crick Institute, London since 2013. In 2018, he became Einstein Professor of Biochemistry, and is a Head of Biochemistry here at the Charité University Medicine (the joint medical faculty of Humboldt and Free state Universities in Berlin, Germany). Laudator

Professor Kathryn S Lilley MAE (University of Cambridge) will give the laudation at the award ceremony. [see: https://www.ae-info.org/ae/Member/Lilley_Kathryn]

Press enquiries to The Executive Secretary at AE HQ, Munich

The Sydney Brenner Medal recognises an individual's substantial life-long scholarly achievement in the fields of Life Sciences, especially molecular and related sciences. The prize carries no financial benefit and is open to nominations of candidates who are members and non-members. Non-members also receive the honour of election to the Academy.

The Medal was established in 2022 and the first prize was awarded in 2023.

Information about the Brenner medal and a list of awardees can be found on our website at www.ae-info.org (specific URL at https://www.ae-info.org/ae/Acad_Main/News/News2/Inaugural%20Award%20of%20the%20Sydney%20Brenner%20Medal)