

Save the Date | Conference March 11–13, Stockholm, KI

Protein Folding in Real Time: From Molecules to Disease



We are delighted to announce an international conference on Protein Folding, Misfolding, and Proteostasis, marking the official launch of a new Swedish Research Council–funded initiative to measure and predict protein folding dynamics at single-molecule resolution. This three-day meeting will bring together leading scientists across physics, biology, medicine, and AI to address one of the central challenges in modern life science: *How do proteins fold and misfold in real time — and how can we intervene when this process goes wrong?*

Why this conference matters

- Protein misfolding underlies diseases such as Alzheimer's, Parkinson's, ALS, cancer, and genetic disorders
- Current methods capture static structures, but disease begins during dynamic folding processes
- This conference connects single-molecule experiments, simulations, AI, and clinical translation in one integrated forum

Sessions span:

- Single-molecule technologies
- Advanced simulations and AI
- Pre-clinical models of misfolding
- Clinical biomarkers and translation
- Instrumentation and microscopy
- Humanities, ethics, and societal perspectives

* Strong international and interdisciplinary focus, with participation from academia, industry, policy, and global research partners.

Who should attend:

- Protein scientists & structural biologists
- Biophysicists and method developers
- Computational and AI researchers
- Clinicians and biomarker experts
- Early-career researchers and students
- Industry partners in biotech and pharma

Registration:

Please confirm your participation as early as possible by filling out the form:

<https://forms.gle/eJ4GK9ePCHkgW2y76>

Questions?

If you have any questions regarding the conference please feel free to contact Dr. Agnese Callegari (agnese.callegari@physics.gu.se).

Organizers:

Joana B. Pereira (Karolinska Institute), Juliette Griffié (Stockholm University, SciLifeLab), Sviatlana Shashkova (Gothenburg University), Julia Fernandez Rodriguez (Gothenburg University), Simon Olsson (Chalmers), Fredrik Westerlund (Chalmers), Markus Wilhelmsson (Chalmers), Augusto Marcelli (Italian Embassy), Giovanni Volpe (Gothenburg University).



Preliminary Conference Program

- Day 1 – 11th March

Location: Aula Medica, Karolinska Institute, Solna	
08:30 – 09:00	Registration Coffee
09:00 – 09:15	Foreword Professor Giovanni Volpe
09:15 – 09:35	Overview of Ongoing European Research Clusters of Excellence and Success <i>TBD</i>
Session 1: International Collaboration and Engagement with Strategic Partners	
09:35 – 09:40	Introduction Dr Julia Fernandez Rodriguez
09:40 – 09:45	Italian Embassy Ambassador Michele Pala
09:45 – 09:50	Japanese Embassy <i>TBD</i>
09:50 – 09:55	Spanish Embassy Ambassador Luis Manuel Cuesta Civís
09:55 – 10:00	UNESCO African Representative <i>TBD</i>
10:00 – 10:30	Coffee Break
10:30 – 11:00	International representative(s) from Italy: Speaker: Dr Giovanna Fragneto , Scientific Director of European Spallation Source Lund, Sweden
11:00 – 11:30	International representative(s) from Japan <i>TBD</i>
11:30 – 12:00	International representative(s) from Spain Speaker: Professor Javier de Felipe , Director of the Cajal Laboratory of Cortical Circuits, Polytechnic University of Madrid, Spain
12:00 – 12:30	International representative(s) from African countries <i>TBD</i>
12:30 – 13:50	Lunch Break
Session 2: Pre-clinical models	
13:50 – 13:55	Introduction Dr Sviatlana Shashkova

13:55 – 14:25	Topic: Collapse of protein homeostasis during cellular aging as driver of degenerative protein aggregation disease Speaker: Professor Harm Kampinga (University of Groningen, The Netherlands)
14:25 – 14:55	Topic: Protein aggregation, aging, and cellular quality control Speaker: Professor Thomas Nystrom (University of Gothenburg, Sweden)
14:55 – 15:25	Topic: Neurodegeneration and brain network changes Speaker: Dr Petronella Kettunen (University of Gothenburg, Sweden)
15:25 – 16:00	Coffee Break
Session 3: Instrumentation	
16:00 – 16:05	Introduction Dr Juliette Griffie
16:05 – 16:35	Topic: Advanced fluorescence spectroscopy and imaging Speaker: Professor Dom Lamb (Ludwig Maximilian University of Munich, Germany)
16:35 – 17:05	Title: Developing single molecule biophysics technology to explore the role of molecular twist in protein unfolding Speaker: Professor Mark Leake (University of York, United Kingdom)
17:05 – 17:35	Topic: High-precision optical microscopy Speaker: Professor Sebastian Deindl (Uppsala University, Sweden)
17:35 – 18:15	Conference activity <i>TBD</i>
18:15 – 20:30	Poster session Finger food

- Day 2 – 12th March

Location: Aula Medica, Karolinska Institute, Solna	
08:30 – 09:00	Registration Coffee
Session 4: Simulations and Proteins	
09:00 – 09:05	Introduction <i>Dr Simon Olsson</i>
09:05 – 09:35	Title: Flow-Induced Crystallisation of Silk Proteins Speaker: <i>Dr Charley Schaefer</i> (University of Leeds, United Kingdom)
09:35 – 10:05	Topic: Enhanced sampling, rare events, and machine-learning approaches to protein folding Speaker: <i>Professor Pratyush Tiwary</i> (University of Maryland, USA)
10:05 – 10:35	Topic: Molecular dynamics simulations of protein folding Speaker: <i>Professor Erik Lindahl</i> (Stockholm University, Sweden)
10:35 – 11:05	Coffee Break
11:05 – 12:30	Company booths
12:30 – 13:50	Lunch Break
Session 5: Clinical Methods and Translation	
13:50 – 13:55	Introduction <i>Dr Joana B. Pereira</i>
13:55 – 14:25	Title: Consequences of protein aggregation in patients Speaker: <i>Dr Betty Tijms</i> (VUMC, Netherlands)
14:25 – 14:55	Topic: Mechanisms of protein aggregation Speaker: TBD
14:55 – 15:25	Title: Biomarkers in ALS: current perspectives and future directions Speaker: <i>Professor Nicola Ticozzi</i> (IRCCS Istituto Auxologico Italiano, Italy)
15:25 – 16:00	Coffee Break
Session 6: Experimental technologies	
16:00 – 16:05	Introduction <i>Professor Fredrik Westerlund</i>
16:05 – 16:35	Topic: Optical tweezers and single-molecule views of protein folding and misfolding Speaker: <i>Professor Carlos Bustamante</i> (University of California, Berkeley, USA)

16:35 – 17:05	Topic: Mechanical manipulation of proteins and folding landscapes at the single-molecule level Speaker: <i>Dr Kasia Tych</i> (University of Cambridge, United Kingdom)
17:05 – 17:35	Topic: Force spectroscopy of proteins Speaker: <i>Professor Mathias Rief</i> (Technical University of Munich, Germany)
17:35 – 19:00	Conference activity: <i>TBD</i>

- Day 3 – 13th March

Location: Aula Medica, Karolinska Institute, Solna	
09:00 – 09:30	Registration Coffee
Activities running in parallel	
09:30 – 12:30	Activity 1
09:30 – 12:30	Activity 2
09:30 – 12:30	Activity 3
09:30 – 12:30	Activity 4
12:30 – 13:50	Lunch Break
Session 7: Humanities	
13:50 – 13:55	Introduction <i>Dr Karl Palmås</i>
13:55 – 14:25	Topic: TBD Speaker: TBD
14:25 – 14:55	Topic: TBD Speaker: TBD
14:55 – 15:25	Topic: TBD Speaker: TBD
Farewell	
15:25 – 15:40	Announcement of Poster Prize Winners <i>Giovanni Volpe</i>
15:40 – 15:55	Artistic output presentation <i>Jacopo Saquegno</i>
15:55 – 16:00	Concluding remarks <i>Giovanni Volpe</i>
16:00 – 17:00	Coffee and networking