

Conference Report

EFMC-ISCB 2025

International Symposium on Chemical Biology
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Aliénor Jeandin^a, Chiara Disraeli^b, Clara Müller^{c,*},
Jessica Hoang^c, Julia Jakiela^c, and Lukas Schneider^b

*Correspondence: C. Müller, E-mail: clara.muller1@proton.me

^aDepartment of Chemistry, University of Zurich, Winterthurerstrasse 190, CH-8057 Zurich, Switzerland; ^bDepartment of Chemistry, University of Basel, St. Johannis-Ring 19, CH-4056 Basel, Switzerland; ^cPharma Research & Early Development (pRED), F. Hoffmann-La Roche Ltd, Grenzacherstrasse 124, CH-4070 Basel, Switzerland.

General Introduction, Opening Ceremony, WuXi Award

The 2nd edition of the EFMC International Symposium in Chemical Biology (EFMC-ISCB) took place in Basel, Switzerland, from the 29th to the 31st of January 2025, jointly organized by the Division of Medicinal Chemistry and Chemical Biology (DMCCB) of the Swiss Chemical Society (SCS) and the European Federation for Medicinal chemistry and Chemical biology (EFMC). The conference featured over 250 speakers and attendees from multiple countries across Europe, the United States, and India. The program was filled with insightful talks, divided into seven sessions with three plenary lectures. After the opening ceremony by Dr. Uwe Grether (F. Hoffmann-La Roche, CH) and Dr. Luc van Hijfte (Symeres, NL), the EFMC-WuXi AppTec Award for Excellence in Chemical Biology ceremony followed, chaired by Dr. Luc van Hijfte (Symeres, NL) and Dr. Dave Madge (WuXi AppTec, UK) (Fig. 1). The 2025 awardee, **Prof. Peng Chen** (Peking University, CN) (Fig. 2) started the morning with his plenary lecture titled: ‘*Deciphering Spatial-Temporal Biology with Bioorthogonal Cleavage Reactions*’. He described the use of bond-cleavage reactions in living systems, in the context of the exploration of a spatio-temporal organization of the proteome and interactome.



Fig. 1. Opening Ceremony of the EFMC-ISCB 2025 Conference. Picture taken by Bernard Dacier.

Session 1 – Cell Targeted Therapeutics: Mechanistic Insights and Drug Discovery

After the plenary lecture by Prof. Peng Chen, the morning session, chaired by Dr. Amanda Cobos Correa (Novartis, CH), was followed by **Prof. Bernd Wollscheid** (ETHZ, CH) who introduced LUX-MS, an optoproteomic technology developed for the elucidation of protein interactions on the cell surfaceome. This was followed by **Dr. Lucas Bethge** (Silence Therapeutics, DE) who introduced the potential of GalNAc-conjugated siRNAs

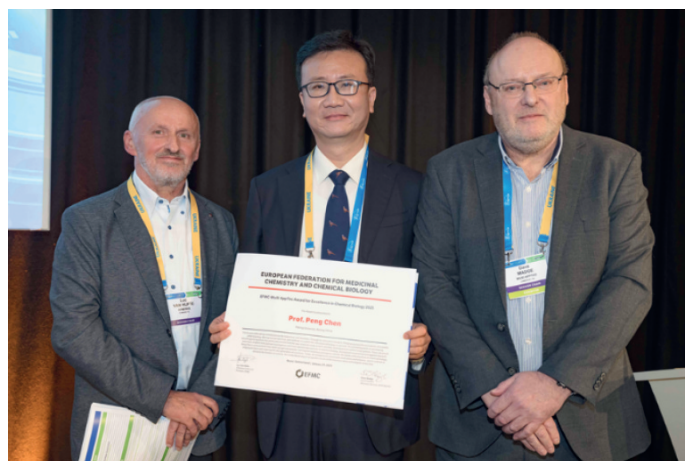


Fig. 2. Prof. Peng Chen (middle) receiving the EFMC-WuXi AppTec Award for Excellence in Chemical Biology by Dr. Luc van Hijfte (left) and Dr. Dave Madge (right). Picture taken by Bernard Dacier.

phosphorodithioates (PS2) for siRNA strand design.

The first session was closed by two insightful lectures by **Dr. Morena Miciaccia** (University of Bari, IT) entitled ‘*Structural Evolution of ONC201-derived Compounds Targeting the Mitochondrial Protease ClpP for Pediatric Diffuse Midline Glioma H3K27-altered*’, followed by **Dr. Israa Al Jamal** (University of Poitiers, FR) ‘*An Enzyme-Responsive Self-Immolative Recognition Marker for Manipulating Cell-Cell Interactions*’. A flash poster session, chaired by Dr. Yves Auberson (Novartis, CH) gave **Lilli Kehr**, **Oscar Nilsson**, **Dr. Takumi Okuda**, **Dr. Louise Plais**, **Eleonora Tesini**, **Dr. Zacharias Thiel**, **Edmee Vandenoorn-Bönnner**, and **Carlo Verhoeve** five minutes each to briefly advertise the content of their posters for the poster sessions held on the second and third day of the conference. The first day was concluded by the welcome reception, where the attendees had the opportunity to network and discuss their innovative research in the field of chemical biology.

Career Panel

The career panel, held on the second morning of the conference, chaired by Dr. Laia Josa Culleré (CSIC, ES), provided a valuable and interactive opportunity for young researchers to learn and ask questions about the different career paths that led the speakers to their current positions. The panel included **Dr. Christoph Dumelin**, Associate Director and Group Leader in Discovery Sciences at Novartis Biomedical Research in Basel; **Dr. Thais Gazzi**, Scientist in Medicinal Chemistry at F. Hoffmann-La Roche in Basel; **Dr. Stephan Hacker**, Assistant Professor at Leiden University; and **Prof. Akane Kawamura**, Chair and Professor of Chemical Biology at Newcastle University.

Session 2 – Complementary Advancements in Probe Design and Platform Technologies for Uncovering Biological Pathways and Drug Target Space, and WuXi AppTec Workshop

The morning session of Thursday was opened with an exciting plenary lecture by **Prof. Ben Davis** (Oxford University, UK), fo-

cusing on post-translational editing, including phosphorylation, fluorination, and glycosylation of proteins, lipids, and sugars to achieve a gain of function of biomolecules. This lecture was followed by a lecture from **Prof. Kai Johnsson** (Max-Planck Institute for Medical Research, DE), who introduced systems based on a split Halo-tag to record various biological events, such as protein-protein interactions, receptor activation, and changes in calcium levels, through fluorescent labeling. After a short break, **Prof. Mario van der Stelt** (University of Leiden, NL) presented chemical probes and chemoproteomics tools to study lipid-signaling pathways in the brain, demonstrating how to control and visualize endocannabinoid messengers. The session continued with **Prof. Marc Nazaré** (FMP, DE), whose group also studied the endocannabinoid system and explored the roles and functions of monoacylglycerol lipase (MAGL), developing a versatile, cell-permeable, specific, and selective probe to visualize MAGL in live cancer cells and neurons. **Dr. László Petri** (HUN-REN RCNS, HU) concluded the morning session with a talk about a fragment-based screening approach combined with a diverse set of electrophilic warheads to identify targetable cysteines for covalent drug design.

During the lunch break, the Wuxi AppTec workshop, led by Dr. Dave Madge and Dr. Alex Pautsch, discussing bifunctional proximity inducers and their growing popularity in drug discovery with a focus on the challenges in the hit finding and biological characterization of these moieties, took place.

Session 3 – Discovery and Application of Peptide Macrocycles in Drug Discovery

Thursday afternoon began with a session chaired by Dr. Alex Pautsch (Boehringer Ingelheim Pharma, DE) with keynote speaker **Dr. Thomas Clairfeuille** (F. Hoffmann-La Roche, CH) discussing the discovery of the antibiotic peptide zosurabalpin. Building on the theme of macrocyclic peptides, **Dr. Christoph Dumelin** (Novartis, CH) presented their potential as tools in drug discovery, particularly in developing an orally bioavailable IL-36 receptor antagonist using mRNA display selection with cyclic peptide libraries. **Prof. Ali Tavassoli** (Curve Therapeutics, UK) introduced a novel platform for intracellular generation and high-throughput screening of cyclic peptide libraries using SI-CLOPP (Split-intein Circular Ligation of Proteins and Peptides). **Dr. Valeria Pingitore** (Universidad Loyola, ES) concluded this session by addressing a major challenge in the drug delivery of these moieties: improving penetration of macrocyclic drugs in the central nervous system (CNS).

Session 4 – New Modalities and Specific Strategies for RNA Modification and Degradation

The last session of Thursday was kicked off by **Dr. Lutz Müller** (F. Hoffmann-La Roche, CH), who demonstrated the countless R&D efforts that went into developing the first oral drug for spinal muscular atrophy, Risdiplam. The session was continued by **Prof. Dr. Stephanie Kath-Schorr** (University of Cologne, DE) whose group investigates the development and application of nucleotide modifications and unnatural nucleotides to expand the genetic alphabet. This session was concluded by **Ms. Yang Liu** (Max Planck Institute of Molecular Physiology, DE) whose work focuses on identifying novel small molecule inhibitors targeting the ribonuclease inositol-requiring kinase 1 (IRE1).

Symposium Banquet

The symposium banquet took place on the Thursday evening at the restaurant Safran Zunft in the city center of Basel (Fig. 3). The magical and antique atmosphere of the historical dining hall allowed all the attendees to connect, share impressions and enjoy



Fig. 3. Symposium Banquet Venue. Picture taken by Lukas Schneider.

a relaxing evening together.

Session 5 – Chemical Biology of Chromatin and the Epitranscriptome

On the last day of the conference, the plenary lecture, chaired by Prof. Claudia Höbartner (University of Würzburg, DE), was titled ‘*Nanopore studies of RNA modifications: from viruses to vaccines*’, and given by **Prof. Cynthia Burrows** (University of Utah, US) whose group investigates modified bases in DNA and RNA with a focus on oxidative stress. Following this exciting talk, the session chaired by Dr. Paola B. Arimondo (Institut Pasteur-CNRS, FR), was opened by keynote speaker, **Prof. Akane Kawamura** (University of Newcastle, UK) who explained how 2-oxoglutarate (2OG) oxygenases participate in modifying chromatin architecture and regulating gene expression. After that, **Prof. Ronald Micura** (University of Innsbruck, AT) presented his research on a structure-guided approach to engineering covalent small molecule-RNA complexes in living cells. **Prof. Daniel Summerer**, (Technical University Dortmund, DE) described his group’s work on strategies of directed protein evolution and chemical protein modification to develop methodologies for studying unexplored aspects of 5-methylcytosine (5mC) modifications and their functions in chromatin regulation. The session was concluded by **Ms. Claudine Greenwood**, (GSK/University of Strathclyde PhD program) who works on the novel covalent tools targeting nucleophilic tyrosine residues of Leishmania donovani bromodomain factor 5 (LdBDF5), unique to parasites, to combat the neglected tropical disease leishmaniasis.

Session 6 – Advances in High-Throughput Chemical Proteomics

The Friday afternoon session, chaired by Dr. François Aute-liano (Evotec, FR), was opened by **Dr. Zongtao Lin**’s (Washington University in St. Louis, US) plenary lecture about an activity-based arginylation profiling (ABAP) platform to differentiate post-translational arginylation from translational arginine residues on a protein site. This was followed by **Dr. Hannah Jones** (University of Oxford, UK) who gave insights into activity-based probes (ABPs) specific to profile the deubiquitinase

(DUB) family with immunoblotting and mass spectrometry proteomics-based readouts. Then, **Dr. Yuehan Feng** (Biognosys AG, CH) highlighted how a limited proteolysis-coupled mass spectrometry (LiP-MS) approach enables the identification of protein structural changes directly in their complex biological context on a proteome-wide scale. This wonderful session was concluded by **Dr. Laurence Arnold** (Pelago Bioscience, SE) with his talk about the Cellular Thermal Shift Assay (CETSA) combined with Cell Painting and its applications to study and visualize the linkage between molecular and cellular phenotypes.

Session 7 – Proximity-Based Chemical Biology and its Application to Drug Discovery

After a short break, the last session of the conference, chaired by Dr. Boris Vauzeilles (CNRS, FR), started with a plenary lecture by **Dr. Arnaud Gautier** (Sorbonne University, FR) whose group combines protein engineering and molecular chemistry to invent new tools, such as fluorescence-activating and absorption-shifting tags (FASTs) as markers, to observe and control biomolecules and dynamic biochemical events in live cells and organisms. The next speaker, **Dr. Pablo Gainza** (Monte Rosa Therapeutics, CH), showcased how Monte Rosa computationally mined the human proteome for motifs resembling β -hairpin or helical G-loops from known cereblon neosubstrates. The last speaker of the conference, **Mr. Marco Serafini** (University of Lisbon, PT) closed the session highlighting his focus on proteolysis targeting chimeras (PROTACs) capable of inducing specific intracellular degradation of Akt protein kinase for the treatment of cancer.

Poster Prizes

After the final lecture, Prof. Gianluca Sbardella (University of Salerno, IT) announced the winners of the poster awards. Barbara Herrmann (TU Wien, AT), Christine Marty (EPFL, CH) and Zeyneb Vildan Cakil (Max Planck Institute for Molecular Physiology, DE), received the joint EFMC/Chemistry Europe poster prize. Additionally, Alfred Doherty (GSK, UK) and Luka Raguž (University of Basel, CH) were honored with the joint EFMC/ISCB prize (Fig. 4).



Fig. 4. Poster prize awards. Picture taken by Brieuc Matagne.

Conclusion

Prof. Claudia Höbartner (University of Würzburg, DE), closed the symposium, highlighting three days of outstanding scientific contributions and discussions on chemical biology. With its high-quality research and collaborative spirit, the event was a great success. We look forward to the next EFMC-ISCB symposium in 2027.