17th Swiss Pharma Science Day 2024

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SAPhS board members

This year's Swiss Pharma Science Day attracted attendees from across Switzerland with diverse research topics within pharmaceutical sciences. As in the previous year it was held at the Von Roll Campus of the University of Bern on August 21. Four keynote speakers presented their research and perspectives on the latest developments in areas ranging from pharmaceutical technology to clinical practice, in line with this year's conference topic «Challenges and Opportunities in Pharmaceutical Sciences». The round-table at the end of the afternoon session spurred discussions between the audience and the presenters.

Young scientists showed their research on posters between the lecture sessions and discussed their data with attendees and reviewers. Three poster authors were given the opportunity for a short oral presentation in the afternoon session. During the award ceremony six posters received one of the sought-after sponsor prizes. The FPH-certified conference included, besides more than 130 on-site participants, for the first time over 50 international online participants, as the SPhSD was open to members of the DPhG and OePhG via live streaming.

Morning Session – Welcome Addresses and Lectures 1-2

The day commenced with a warm welcome from the co-presidents of the Swiss Academy of Pharmaceutical Sciences (SAPhS), Prof. Dr. Ursula von Mandach and Prof. Dr. Verena Schröder, who highlighted the importance of innovative approaches in drug development.

The opening remarks were followed by the morning session chaired by Prof. Verena Schröder, starting with a lecture by **PD Dr. med. Steve Pascolo** from the University Hospital Zurich. In his lecture entitled *«Synthetic mRNA – New Paths to New Drugs»* he discussed the evolving potential of synthetic mRNA in both vaccine and therapeutic development. He highlighted the rapid advances made during the COVID-19 pandemic, and how these breakthroughs are now being applied to create new vaccines and treatments for other infectious diseases and cancers. His talk also explored the manufacturing scalability and robustness of mRNA, positioning it as a cornerstone of future pharmaceutical innovations. His lecture abstract and biosketch can be found on p. 7 of the Conference Booklet.

A second lecture on the topic *«Artificial Intelligence – Friend or Foe?»* was held by **Prof. Stéphane Guerrier** from the University of Geneva. In his talk entitled *«Data Analytics and Artificial Intelligence in Pharmaceutical Sciences»*, he presented an exploration of how artificial intelligence (AI) and machine learning (ML) are transforming pharmaceutical research. By merging advanced statistical techniques with AI he explained how predictive modeling enhances research efficiency. As an exemplary application of ML in analyzing Electronic Health Records (EHR) he showed that it enables scalable research across institutions. Additionally, statistical transfer learning can use EHR data to address related problems with limited data. However, he also cautioned against the over-reliance on AI, by emphasizing the need to avoid correlations that may be misleading. He proposed using the individual strengths of AI and ML in a balanced approach.
His lecture abstract and biosketch can be found on p. 8 of the Conference Booklet.

Lunch Break and Poster Session

During an extended lunch break, attendees visited the poster gallery featuring 47 posters from young scientists. Lively discussions between presenters and participants were held throughout the break. The poster abstracts can be found in the conference booklet on pp. 12-70. This year's posters spanned a wide range of topics including pharmaceutical biology, phytopharmacology, pharmaceutical technology, pharmacoepidemiology, clinical pharmacy, clinical pharmacology, molecular pharmacology, molecular medicine and pharmacology, as well as biopharmacy.

A platform for the SAPhS partner associations GSASA and SAPP was provided during the lunch break, where members introduced their organizations and engaged with the audience.
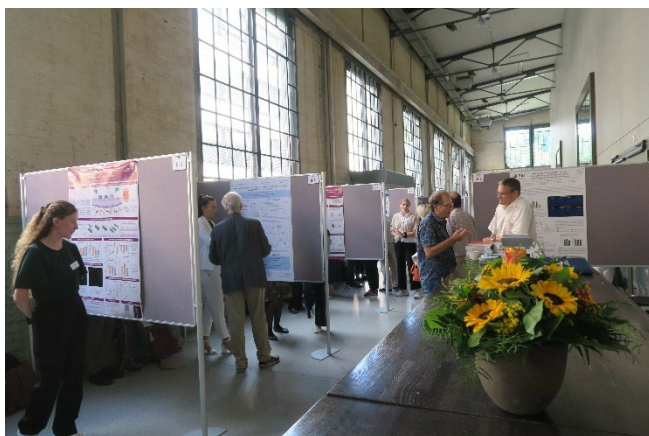
Afternoon Session – Short Oral Presentations, Lectures 3-4 and Award Ceremony

The afternoon session was chaired by the SAPhW board member Prof. Klaus Eyer and kicked off with 3 short oral presentations of selected poster abstracts (SOPs) that had been selected by the reviewer board. The young researchers were given the opportunity to showcase and discuss their outstanding research in front of the audience.

Ana Katrina Mapano from the Paul Scherrer Institute (PSI) presented ***«Preclinical radionuclide therapy of neuroendocrine neoplasms using radiolabelled somatostatin analogues»*** (P-VI-2, see p. 59 of Conference Booklet). Radionuclide therapy targeting the somatostatin receptor is used to treat neuroendocrine tumors, though complete responses are rare. This study evaluated two novel radio-pharmaceuticals, [149Tb]Tb-DOTATATE and [149Tb]Tb-DOTA-LM3, both paired with the alpha-emitting radionuclide terbium-149, in tumor cells and mice. In contrast to [149Tb]Tb-DOTATATE, [149Tb]Tb-DOTA-LM3 is not taken up by cells. Both compounds decreased tumor cell viability and caused DNA damage. In mice, a single or double dose of either radiopharmaceutical significantly delayed tumor growth, extending survival. The treatment was well-tolerated, with no major adverse effects on blood or kidney function. Both radiopharmaceuticals demonstrated similarly strong potential for improving targeted radionuclide therapy independent of their subcellular localization.

Remo Eugster from the University of Bern presented ***«Machine learning-driven optimization of liposomal drug development in microfluidic systems»*** (P-II-1, see p. 29 of Conference Booklet). Liposomes are crucial in drug delivery, and their production by microfluidics has gained prominence, especially during the COVID-19 pandemic. However, optimizing liposome production remains challenging due to limited understanding of lipid behavior on their formation. This study aimed to develop a robust, scalable process for microfluidic liposome production using machine learning (ML) to predict lipid behavior. Various phospholipids were tested, and ML models predicted key formulation and process parameters for liposome formation and size, enhancing the efficiency of production. The integration of AI offers a new

approach to streamline microfluidic liposome production, with the potential to accelerate drug delivery system development in pharmaceuticals.

Tamara Balsiger from the University of Basel presented *«Natural product drug discovery pipeline reveals ellagic acid to reduce forgetting in Caenorhabditis elegans through specific musashi inhibition»* (P-I-4, see p. 18 of Conference Booklet). Memory loss, particularly in neurodegenerative diseases like Alzheimer's, is a significant concern. The RNA-binding protein Musashi (MSI) has been identified as a key factor in promoting forgetting. This study aimed to discover new MSI inhibitors from plant sources. Screening a library of 2,576 plant extracts led to the identification of *Freziera candicans* extract from which the most potent active compound as MSI inhibitor being ellagic acid (EA). EA significantly improved short- and long-term memory in *Caenorhabditis elegans* models through MSI inhibition and rescued Alzheimer's-related phenotypes. Further research will explore EA's binding to MSI, potentially leading to new treatments for memory impairment.

After the SOPs followed the third plenary lecture on the topic *«Formulation Science and Manufacturing»*, held by **Prof. Jean-Christophe Leroux** from ETH Zurich. In his talk entitled ***«3D Printing of Drug Eluting Devices: A Research Perspective»,*** he introduced the audience to innovative 3D-printing techniques in drug formulation, focusing on digital light processing (DLP) for creating biodegradable medical devices. His research presented new possibilities for producing personalized drug-delivery systems, particularly in challenging therapeutic areas such as airway stents and oral formulations. New inks for DLP printing were developed in his lab to print customizable therapeutic devices with adjustable mechanical properties and degradation profiles. Biodegradable airway stents were able to degrade into hydrogels and disappeared after 7 weeks in rabbits. The stents could also be loaded with drugs, with tunable release rates, and shape memory stents were designed for easy deployment, unfolding in place after administration. DLP was further used to prototype innovative oral formulations, including buccal suction cups for peptide drug delivery and pH-sensitive capsules for probiotic delivery.

His lecture abstract and biosketch can be found on p. 9 of the Conference Booklet.

The fourth plenary lecture on the topic *«Improving Pharmaceutical Care»* was given by **Prof. Carla Meyer-Massetti**, University Hospital Inselspital Bern. In her talk entitled ***«Clinical Pharmacy – Improving Medication Safety»***, she was focusing on improving medication safety through clinical pharmacy. She explained that medication-related problems, including adverse drug reactions and medication errors, are among the most common adverse events in healthcare. While their causes are well understood, strategies for sustainably improving medication safety remain unclear. This presents both a challenge and an opportunity for clinical pharmacists across various healthcare settings. Together with PhD students from her group Prof. Meyer-Massetti illustrated with practical insight how integrating pharmacists into healthcare teams can reduce medication errors and adverse drug reactions. The focus is on vulnerable patients, medication reconciliation, and the inclusion of patients and caregivers. By following a fictional patient case, she demonstrated the positive impact of clinical pharmacists in optimizing patient safety across different care settings.

Her lecture abstract and biosketch can be found on p. 10-11 of the Conference Booklet.

With this highly practical side of research the scientific afternoon session was concluded. During the coffee break, discussions were continued and participants strengthened their networks.

The following **round table** was moderated by SAPhS board member Prof. Gerrit Borchard and allowed for questions to all presenters. The audience vividly interacted with the speakers and the scientific discussions reflected the strong interest in new opportunities in pharmaceutical research.

The afternoon program ended with the much-anticipated **award ceremony**, moderated by SAPhW co-president Prof. Ursula von Mandach and vice-president Prof. Matthias Hamburger.

First, **Martine Ruggli**, president of pharmaSuisse, was awarded **SAPhS Fellow 2024** for her outstanding work for pharmacists. Laudatio: *«Pharmacist, current President of pharmaSuisse, is honoured for her invaluable and pioneering contributions to the field of public pharmacy, to the development of innovative practices and interprofessional collaboration, and her dedication and commitment to advance our profession to be recognized as a crucial player in the primary healthcare system.»*
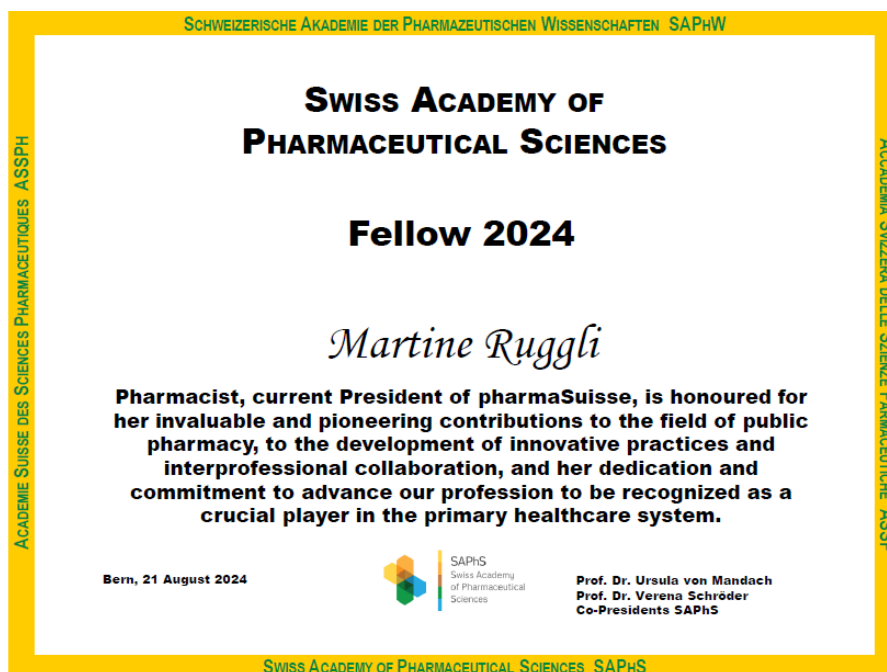
Martine Ruggli took the opportunity to express her gratitude by highlighting not only her appreciation for the honor received, but also the important role that pharmacists play in advancing research. She emphasized how their expertise and dedication are instrumental in driving innovation, improving patient outcomes, and shaping the future of healthcare.

The award ceremony ended with exceptional research projects being awarded with the six poster prizes. The selection was based on several key criteria, including the clarity and originality of project objectives, the methodology employed, the quality of the results, the alignment of conclusions with the data, as well as the overall scientific significance and presentation quality, including visual elements. Once again, the awards were generously funded by the AKB Foundation, GSIA Foundation, CSL Vifor, Max Zeller Söhne AG, Pharmaceutical Society of Zurich, and Prof. Carla Meyer-Massetti. For poster award winners and their abstracts see also SAPhW website.

The **First Prize**, sponsored by the AKB Foundation, was awarded to **Rafaela Gazzi**, University of Bern, for P-II-10, entitled ***«3D-printed lipid mesophases for the treatment of chronic liver disease».***

The **Second Prize**, sponsored by the GSIA Foundation, was awarded t**o Coralie Godot**, University of Geneva, for P-IV-4, entitled ***«Digital healthcare services in community pharmacies: The PneumoscopeTM case study»***.

The **Third Prize**, sponsored by the Pharmaceutical Society of Zurich (PharmGZ), was awarded to **Jitka Kalasová**, University of Applied Sciences and Arts Northwest - Institute for Pharma Technology, for P-II-5, entitled ***«Developing a novel solubility measurement technique based on second harmonic generation»***.

The prize for the **best poster in Pharmaceutical Technology**, sponsored by CSL Vifor and handed over by Ralf Wiesmann, was awarded to **Steffen Honrath**, ETH Zurich, for P-II-4, entitled *«Proteomics-supported improvement of TFAMoplex-mediated transfection»*.

The prize for the **best poster in Pharmaceutical Biology and Phytopharmacology**, sponsored by Max Zeller Söhne AG and handed over by Prof. Veronika Buttwerweck, was awarded to **Albane Zingg**, University of Geneva, for P-I-3, entitled *«Insights into the mechanism of action of a withanolide derivative in multiple myeloma».*

The prize for the **best poster in Clinical Pharmacy**, sponsored and handed over by Prof. Carla Meyer-Massetti, was awarded to **Micheline Sarbach**, University of Basel, for P-IV-6, entitled *«Personalized adherence interventions with electronic monitoring: A case report on polypharmacy management in epilepsy».*

Closing Remarks and Acknowledgements

The 17th SPhSD closed with final remarks and acknowledgements from the SAPhW vice-president Prof. Matthias Hamburger on behalf of the whole organizing committee. He expressed gratitude to the participants, speakers, chairs, reviewer board, BT University of Bern for technical assistance, team ZFV for catering, and above all the sponsors, whose essential financial support contributed to the event's success. Attendees were encouraged to stay connected and were reminded to mark their calendars for next year's Pharma Science Day. The event concluded with the traditional farewell reception, providing attendees with the opportunity to reflect on the challenging lectures and stimulating poster presentations, as well as to network and socialize - one of the main goals of the SPhSD.

Everyone is warmly invited to join us again for the 18th SPhSD 2025, which will once again take place at the University of Bern. We look forward to seeing you all again!

Comments, suggestions, and questions are welcome!
Please send to the SPhSD organizers:

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Bern, October 2024
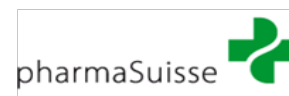
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