

Patient-centric lipid-based therapeutic approaches to tackle inflammation and fibrosis

Prof. Dr Paola Luciani

Department of Chemistry, Biochemistry and Pharmaceutical Sciences, University of Bern
<https://lucianiresearch.com> ; paola.luciani@unibe.ch



The treatment of fibrosis and inflammation remains challenging due to their complex nature, requiring localized and sustained interventions. Our group has developed lipid-based and 3D-printed drug delivery systems tailored for conditions such as osteoarthritis, ulcerative colitis, peritoneal disease, endometriosis, and recurrent urinary tract infections. Using liposomes and lipid mesophases, we created long-acting injectables, temperature-triggered gels, and self-emulsifying oral printlets to enhance drug solubility, retention, and antifibrotic activity. In women's health, we designed mucoadhesive ovules and stents for sustained local therapy. Across models, these technologies improved therapeutic efficacy while minimizing systemic side effects. Collectively, our work demonstrates how lipid and additive manufacturing platforms can transform localized treatment strategies in reproductive, gastrointestinal, musculoskeletal, and hepatic diseases, with strong translational potential.

Paola Luciani is Full Professor of Pharmaceutical Technology at the University of Bern since 2019 and Director of Study of the Bachelor in Pharmaceutical Sciences since 2020. Before moving to Bern, she was Associate Professor for Phospholipids in Drug Development at the University of Jena, Germany, and had research positions at the University of Florence and ETH Zurich under the mentorship of Profs. Piero Baglioni and Jean-Christophe Leroux, respectively. Paola was Vice-President of the Controlled Release Society Local Chapter Germany/Switzerland/Austria and is, since March 2025, President. She serves as Vice-President Science of the Swiss Academy of Pharmaceutical Sciences. Paola acts as external Specialist for Pharmaceutical Quality of Swissmedic (Swiss Agency for Therapeutic Products) and Expert of the NANO (Nanomedicine) Working group of the European Pharmacopoeia. She is a member of the Scientific Advisory Council of the Phospholipid Research Center, Heidelberg. In 2023 she co-founded the Center of Extracellular Vesicle Research (EVR) at the University of Bern. A determined advocate for gender equality, diversity, and inclusion, Paola served as a member of the Equal Opportunity Committee of the Faculty of Science at UniBE and a mentor for the SCS Swiss Women in Chemistry. She is currently a mentor of the Young Committee YCS Mentoring program and of the European Pharmaceutical Students' Association EPSA.

Her research focuses on the design and characterization of lipid-based delivery systems for drug delivery and diagnosis, with a focus on treatments for fibrotic diseases. Paola has been named Emerging Investigator 2017 by the Royal Society of Chemistry. In 2024, she was awarded the Breaking Barriers Breakthrough Award of the Controlled Release Society's Skin and Mucosal Delivery Focus Group.

Host: Jeanne Leblond Chain, ARNA laboratory