

3rd International Symposium of the CRC 1449 “Dynamic Hydrogels at Biointerfaces”

October 5 – 6, 2026

It is a great pleasure to invite you to our 3rd International Symposium on “Dynamic Hydrogels at Biointerfaces” which will take place from October 5-6, 2026 at the Freie Universität Berlin.

This symposium is organized by our Collaborative Research Center (CRC) 1449 „Dynamic Hydrogels at Biointerfaces“ (www.sfb1449.de) with a major focus on mucus. We offer several exciting invited lectures and sessions on mucus biology, analysis, rheology, glycobiology and peptides. Additionally, the CRC will present its collaborative projects.

The overarching goal of this CRC symposium is to discuss the key parameters that determine protective hydrogel function at biological interfaces. The CRC initiative is driven by biomedical questions with a long-term and increasingly translational perspective:

- (1) understanding the structure, properties and dynamics of hydrogels at biointerfaces at the molecular level; by complementary experimental and theoretical approaches;
- (2) dynamic behavior and modelling of native vs. synthetic hydrogels; definition of the barrier function of the glycocalyx and mucus as well as interaction of interfacial layers;
- (3) overcoming barrier dysfunction to prevent infection and inflammation by synthetic mucus-mimetics, modulation of mucus (dys)function by mucolytic agents and to develop and test the diagnostic and therapeutic potential of our strategies.

We are convinced that only a transdisciplinary approach based on expertise in physics, chemistry, material sciences, biology, and medicine that is integrated with frontline modeling approaches will allow the much needed comprehensive investigation of the complex and dynamic hydrogel networks at biointerfaces of the airways and intestine.

We are looking forward to welcome you in Berlin.

Symposium Chairs

Prof. Dr. Rainer Haag,
Spokesperson CRC 1449
Freie Universität Berlin
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Program

Monday, OCTOBER 5, 2026

8:30 REGISTRATION

9:00 OPENING

Prof. Rainer Haag | Spokesperson of the CRC 1449, Freie Universität Berlin

SESSION – INTERACTIONS WITH BARRIERS IN THE LUNG

Chair: Marcus Mall

09:15 Clinical features of mucus plug-high asthma and COPD and strategies to treat them

Prof. John Fahy | University of California, San Francisco, USA

10:00 Using glycosaminoglycans to guide precision medicine in the intensive care unit

Prof. Eric Schmidt | Harvard Medical School & Massachusetts General Hospital, USA

10:45 COFFEE BREAK

SESSION – MUCUS HYDROGELS AND GLYCOCALYX

Chair: Beate Kokschi

11:15 Modulating the permeability of mucin gels with nanoparticles – nanoplastics vs nanomotors

Prof. Oliver Lieleg | Technische Universität München, D

11:40 Organized surface layers on the apical surface of the alveolar epithelium: Ultrastructure, composition, and component-driven barrier function

Dr. Shailey Twamley (B01) | Charité – Universitätsmedizin Berlin

12:05 Role of *Pseudomonas aeruginosa* in mucus dysfunction in bronchiectasis

Dr. Christine Wong (C04) | Charité – Universitätsmedizin Berlin

12:30 LUNCH BUFFET

SESSION – MUCINS AND GLYCOSYLATION

Chair: Christian Hackenberger

13:30 Mucus Hydrogels – Polymerization and Glycosylation in Models of Lung Disease

Prof. Christopher Evans | University of Colorado Anschutz, USA

14:15 Chemical Precision Tools to Track the Cellular Activity of Glycosyltransferases

Prof. Benjamin Schumann | Technische Universität Dresden, D

14:40 Overcoming barriers - a cell-permeable nanobody to restore CFTR activity in cystic fibrosis

Dr. Luise Franz (C05) | Leibniz-Forschungsinstitut für Molekulare Pharmakologie Berlin, D

15:15 15 SPEED LECTURES from selected posters

16:15 COFFEE BREAK & POSTER SESSION

18:30 CONFERENCE DINNER

Alter Krug Dahlem, Königin-Luise-Straße 52, 14195 Berlin

Tuesday, OCTOBER 6, 2026

8:30 REGISTRATION

SESSION – MUCOLYTICS AND RHEOLOGY

Chair: Marina Pigaleva

9:00 Live cell rheometer links mucus rheology to cilia activity

Prof. Gerald Fuller | Stanford University, USA

9:45 Mucus plugging in asthma: molecular and cellular insights

Prof. Maude Liégeois | Université de Liège, BE

10:30 Magnetic Microwire Rheology: Theory and Data Analysis

Merten Strehlau (A01) | Technische Universität Berlin

10:50 COFFEE BREAK

SESSION – MUCIN FUNCTION AND HYDROGEL CHARACTERIZATION

Chair: Kevin Pagel

11:20 Regulation of mucus barrier function

Prof. Dave Thornton | The University of Manchester, UK

12:05 Interaction of Mucus and Metals – How Metalloglycobiology Shapes the Mucus Composition

Prof. Maria Maares | Universität Potsdam, D

12:25 PEG-induced collapse of mucin-inspired polymers during gelation revealed by EPR spectroscopy

Dr. Marina Pigaleva (Z01) | Freie Universität Berlin

12:45 LUNCH BUFFET

SESSION – MUCUS BARRIER FUNCTION

Chair: Daniel Lauster

13:45 Mucus and Biofilms as Biological Barriers to Anti-infective Drug Delivery

Prof. Claus-Michael Lehr | Universität des Saarlandes & Helmholtz-Institut für Pharmazeutische Forschung Saarland, D

14:30 Integrative computational analysis to study the interplay between mucus, infection and inflammation in cystic fibrosis

Dr. Laura Schaupp (B05) | Charité – Universitätsmedizin Berlin

14:50 Motion of Salmonella Typhimurium in Bulk, Hydrogels, and Mucus

Prof. Stephan Block (B03) | Freie Universität Berlin

15:15 COFFEE BREAK

SESSION – HYDROGELS FOR CELL CULTURE AND FUNCTION

Chair: Rainer Haag

15:45 Recreating the Living Tumor Biointerface: Dynamic Hydrogels, 3D Bioprinting, and Precision Nanomedicine

Prof. Ronit Satchi-Fainaro | Tel Aviv University, ISR

16:30 The structure of a natural human mucin

Dr. Gaël Vos (C01) | Freie Universität Berlin

16:50 Finding the Sweet Spot: Identifying an Alveolar Biomarker Target

Dr. Karen Hoffmann (C03) | Charité – Universitätsmedizin Berlin

17:10 Decoding protein glycosylation using ion mobility-mass spectrometry

Dr. Leïla Bechtella | Université Evry Paris-Saclay, F

17:30 POSTER PRIZES & CLOSING REMARKS

Prof. Rainer Haag | Freie Universität Berlin

Venue & Location

Freie Universität Berlin

Institute of Chemistry and Biochemistry

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Local Organization

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CRC 1449 – Partner Institutions



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