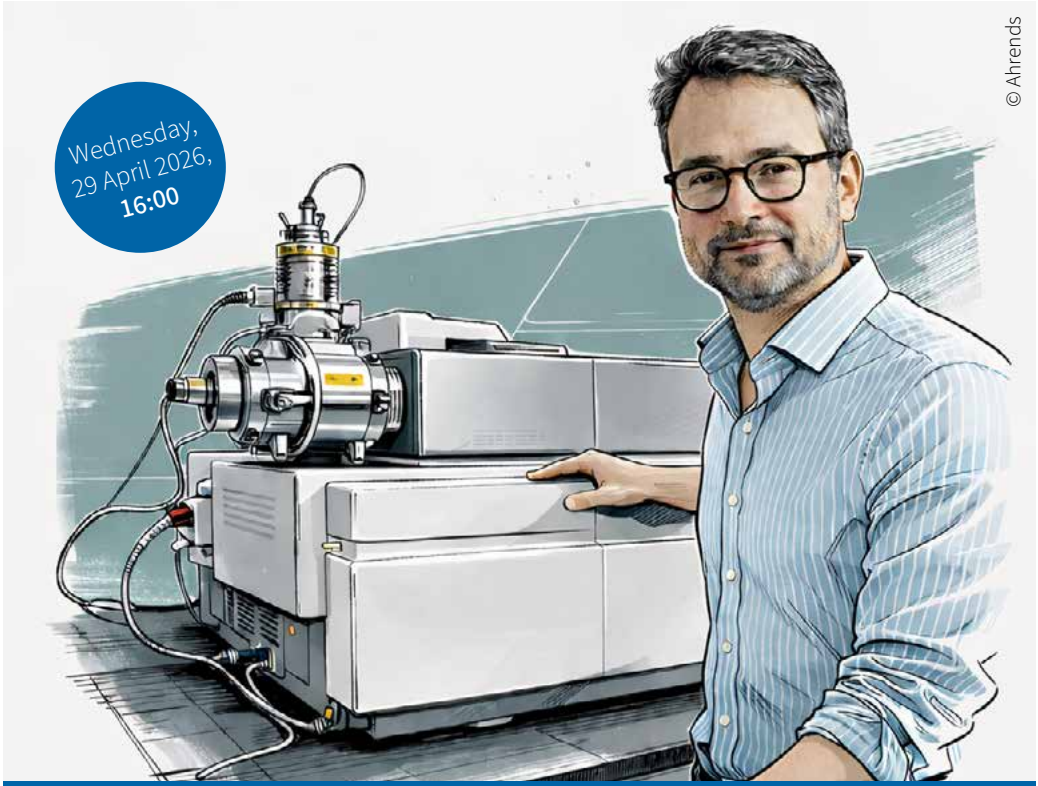
universität wien

Faculty of Chemistry

Invitation to the inaugural lecture

Fat: Friend or Foe? Decoding the Role of Lipids in Life with Computational Mass Spectrometry



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Robert Ahrends
Professor of Computational Mass Spectrometry

Main Ceremonial Hall of the University of Vienna · Universitätsring 1, 1010 Vienna

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Robert Ahrends

Professor of Computational Mass Spectrometry at the Institute of Analytical Chemistry, Faculty of Chemistry

He trained in biochemistry and analytical chemistry at the Justus Liebig University Giessen and already during his diploma studies focused on quantitative biology and chemical systems analysis. With an IKB PhD stipend, he expanded this analytical and chemistry-driven focus by developing quantitative proteomics strategies based on metal-tagging and elemental mass spectrometry at the Humboldt University, Berlin. These approaches leveraged coordination chemistry and isotopic encoding for multiplexed, high-dimensional protein quantification. The resulting technologies were protected through national and international patents and established new standards for quantitative single-cell proteomics. Through this work and his time at Agilent Technologies, he identified fundamental limitations in conventional mass spectrometry: not only in throughput and sensitivity, but in the absence of scalable computational frameworks capable of translating high-dimensional mass spectrometric data into biological insight.

To address these challenges, he joined the Department of Chemical and Systems Biology at Stanford University. By integrating quantitative analytical workflows, isotope-labeled standards, and data-driven computational modeling, he revealed that fat cell differentiation is a noise-dependent, multi-feedback process that becomes irreversibly locked once a critical threshold is crossed. This work demonstrated how computational modeling of high-dimensional mass spectrometry data can uncover nonlinear biological decision processes that remain invisible to purely experimental analysis.

He subsequently established an independent research program at the Institute for Analytical Sciences in Dortmund, focusing on quantitative and computationally driven lipidomics. Since October 2023, he is Full Professor of Computational Mass Spectrometry at the University of Vienna.

Research areas

His research aims to transform mass spectrometry into a quantitative, computational platform for lipidomics and systems-level analysis of cellular chemistry. He and his team established Lipidomics Informatics for Life Sciences (LIFS), a computational infrastructure that systematically maps lipid chemical space and enables scalable interpretation of large-scale lipidomics datasets. The group develops integrated analytical and computational strategies to study lipid–lipid interactions, enzymatic lipid remodeling, and the dynamic role of lipids in membrane organization and signaling. The long-term goal is to establish quantitative, computation-enabled chemical frameworks that make complex cellular communication measurable and predictive, and to identify novel molecular targets for therapeutic intervention, particularly in cardiometabolic disorders.

“Our research aims to quantitatively decode the complex relation of lipids and translate this chemical space into new strategies for understanding and treating lipid-related diseases”

Programme

Wednesday, 29 April 2026, 16:00
Main Ceremonial Hall of the University of Vienna
Universitätsring 1, 1010 Vienna

16:00
Welcome
by Manuela Baccarini
(Vice-Rector of the University of Vienna)

Opening words
Christian Becker
(Dean of the Faculty of Chemistry)

Inaugural lecture
Robert Ahrends

Fat: Friend or Foe?
Decoding the Role of Lipids in Life with Computational Mass Spectrometry

Following the lecture, we invite you to join us for a reception with light refreshments.

For organisational reasons, please register for the event on the Faculty of Chemistry's website **by 20 April 2026**.

Barrier-free access
right side entrance, lift to the 1st floor

Es wird angestrebt, die Veranstaltung nach den Kriterien des Prädikats ÖkoEvent durchzuführen.

Hinweise zu einer klimafreundlichen Anreise finden Sie hier.

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