



KEMIJSKI INŠTITUT

Vabilo na Preglov kolokvij / Invitation to the Pregl colloquium

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Velika predavalnica Kemijskega inštituta /
Great Lecture Hall
National Institute of Chemistry
Hajdrihova 19, Ljubljana, Slovenia

**From Spectra to Knowledge: Revealing the Unseen in
Chemical and Biomedical Sciences**

Spectroscopic techniques provide a wealth of information, yet their complexity often conceals subtle but crucial insights. In this lecture, I will illustrate how chemometric approaches can transform spectral data into meaningful knowledge, enabling the extraction of hidden features that are otherwise inaccessible. Circular dichroism (CD) and small-angle X-ray scattering (SAXS) spectra, when coupled with advanced data analysis, allow the recovery of unprecedented structural information about non canonical DNA structures, offering new perspectives on their conformational diversity and biological relevance. Moreover, nuclear magnetic resonance (NMR) spectra of biological fluids, analyzed through multivariate statistical methods, provide valuable markers of health status and therapeutic response across diverse biological contexts. These case studies demonstrate how the integration of chemometrics with spectroscopy unveils patterns and relationships beyond conventional analysis, opening avenues for structural biology, biomarker discovery, and translational applications. Ultimately, this approach exemplifies how spectral complexity can be converted into actionable scientific knowledge.



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Vljudno vabljeni / Kindly invited