

## High-Resolution FTICR Mass Spectrometry for Protein Structure Analysis

The Junior Research Group "Protein-Ligand Interaction by Ion Cyclotron Resonance Mass Spectrometry" uses high-resolution Fourier transform ion cyclotron resonance (FTICR) mass spectrometry for structural and functional analysis of proteins. Our research focuses on the application of chemical cross-linking combined with FTICR mass spectrometry to determine low-resolution three-dimensional structures of proteins and protein complexes. The general procedure involves conjugation of interacting amino acids with a variety of cross-linking reagents followed by enzymatic proteolysis of the cross-linked protein(s). The highly complex peptide mixtures are subsequently analyzed by nano-HPLC (high-performance liquid chromatography)/nano-ESI (electrospray ionization)-FTICR mass spectrometry. Based on the distance restraints derived from the chemical cross-linking data in combination with recently developed computational methods, we are able to generate three-dimensional structure models of the proteins.

Further aims of our research are the investigation of non-covalent complexes by ESI-FTICR mass spectrometry and the development of gel-free approaches for the analysis of complex protein mixtures. Currently, we are developing a global proteomics approach based on multi-dimensional chromatography and FTICR mass spectrometry.

### Selected References

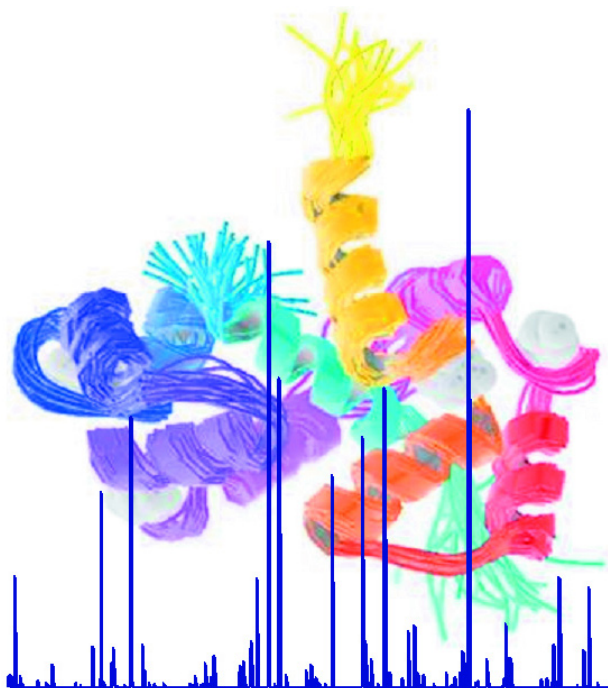
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### Keywords

- Bioanalytical Chemistry
- Mass Spectrometry
- Protein Structure



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