

WED2P • Structural Dynamics in Biological Systems*Panoramica***10:45–12:30****WED2P • Structural Dynamics in Biological Systems***Chair: Sandy Ruhman, The Hebrew University, Jerusalem, Israel***WED2P.1 • 10:45**

Energy transfer along a Poly(Pro) - peptide, ●Wolfgang Zinth¹, Wolfgang J. Schreier¹, Tobias E. Schrader¹, Florian O. Koller¹, Markus Löweneck^{2,3}, Hans-Jürgen Musiol², and Luis Moroder²; ¹LS für BioMolekulare Optik, LMU München, München, Germany, ²Max-Planck Institut für Biochemie, Martinsried, Germany, ³present address: Senn Chemicals, Dielsdorf, Switzerland.

Using a novel molecular thermometer, p-nitro-phenylalanine, we investigate the transport of vibrational excess energy along a poly(Pro) sequence. Time resolved IR-spectroscopy reveals that heat transfer proceeds at a speed of several Å per picosecond.

WED2P.2 • 11:00

Energy Transport in Peptide Helices around the Glass Transition, ●Ellen Backus¹, Phuong Nguyen², Virgiliu Botan¹, Rolf Pfister¹, Alessandro Moretto³, Marco Crisma³, Claudio Toniolo³, Gerhard Stock², and Peter Hamm¹;

¹Physikalisch-Chemisches Institut, Universität Zürich, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland, ²Institut für Physikalische und Theoretische Chemie, J.W. Goethe Universität, Max-von-Laue-Strasse 7, D-60438 Frankfurt, Germany, ³Institute of Biomolecular Chemistry, University of Padova, via Marzola 1, I-35131 Padova, Italy.

The energy transport through a small helical peptide has been studied as function of temperature. Surprisingly, the diffusive transport dominates at high temperature, while at low temperature ballistic transport seems to be important.

WED2P.3 • 11:15

Ultrafast Vibrational Dynamics of Adenine-Thymine Base Pairs in Hydrated DNA, Jason R. Dwyer, Lukas Szyz, ●Erik T. J. Nibbering, and Thomas Elsaesser; Max-Born-Institute, Max-Born-Str. 2 A, D-12489 Berlin, Germany.

We report femtosecond two-color pump-probe studies of the congested N-H/O-H stretching absorption of high-quality thin films of DNA oligomers in a broad hydration range. Different vibrational excitations are separated and their characteristic relaxation times identified.

WED2P.4 • 11:30

Photodynamics of Blue Light Sensing Proteins Viewed Through Ultrafast Vibrational Spectroscopy: BLUF Domain

of AppA and Its Mutants, Allison Stelling¹, Minako Kondo², Kate Ronayne³, Peter Tonge¹, and ●Stephen Meech²; ¹SUNY Stony Brook, New York, UDA, ²University of East Anglia, Norwich, UK, ³Rutherford Appleton Laboratory, STFC, Didcot, UK.

The mechanism of blue light sensing in the photoactive protein AppA is investigated by transient infra-red spectroscopy, mutagenesis and isotope editing. Modes associated with the flavin excited state and perturbation of the protein are detected.

WED2P.5 • 11:45

Direct observation of ligand transfer and bond formation in cytochrome c oxidase using mid-infrared chirped-pulse upconversion, Johanne Treuffet, Kevin Kubarych,

Jean-Christophe Lambry, Eric Pilet, Jean-Baptiste Masson, Jean-Louis Martin, Marten Vos, Manuel Joffre, and ●Antigoni Alexandrou; Laboratoire d'Optique et Biosciences, Ecole Polytechnique, Palaiseau, France.

We time resolved the CO ligand transfer process in the bimetallic active site of cytochrome c oxidase, using mid-infrared chirped-pulse upconversion to observe the full vibrational signature of Fe-CO bond breaking and Cu-CO bond formation.

WED2P.6 • 12:00

Tryptophan Residues as Natural Ultrafast Voltmeters in Retinal Proteins, ●Jérémy Léonard¹, Erwin

Portuondo-Campa², Andrea Cannizzo², Franck Van Mourik², Jörg Tittor³, Stefan Haacke¹, and Majed Chergui²; ¹Institut de Physique et Chimie des Matériaux de Strasbourg, UMR 7504 ULP - CNRS, F-67034 Strasbourg, France, ²Laboratoire de Spectroscopie Ultrarapide, ISIC - EPFL, BSP, CH-1015 Lausanne, Switzerland, ³Max-Planck-Institut für Biochemie, 82152 Martinsried, Germany.

The comparison between UV transient absorption spectra of wild type bacteriorhodopsin and two tryptophan-mutant proteins gives evidence for the possibility to use tryptophans as ultrafast probes for the photo-induced dipole moment change in retinal proteins.

WED2P.7 • 12:15

Interrogating fiber formation kinetics with automated 2D-IR spectroscopy, ●David Strassfeld, Yun Ling, Sang-Hee Shim, and Martin Zanni; Department of Chemistry, University of Wisconsin - Madison, Madison, WI 53706-1396.

We extract structural kinetics towards better understanding the aggregation pathway of amylin, the protein component of the amyloid fibers found to inhibit pancreatic cell function in type II diabetes patients, using automated 2D-IR spectroscopy.