Orange County Local Section of the American Chemical Society

February Dinner Meeting

Thursday, February 16, 2012

The DoubleTree Club Hotel
7 Hutton Centre Drive, Santa Ana
Phone: 714-751-2400

Social: 6:00 PM
Dinner: 6:30 PM
Program 7:00 PM
Presentation: 7:15PM

Seeing Through Cataract Formation with NMR

Dr. Rachel W. Martin
Associate Professor of Chemistry and Molecular Biology & Biochemistry,
University of California, Irvine

Reservations:

Please contact us no later than 12 noon on Monday, February 13, 2012 at OCACS@sbcglobal.com Please indicate if you will be attending the dinner and program or the program only. Also, please list all names of attendees.

Note: OCACS pays the hotel on the basis of the number of dinner reservations made. Your RSVP for dinner is a commitment to pay for dinner. Dinner cost is $25 for Members and Member's Significant Others; $30 for Non-Members or those without reservations.

Members and guests are invited to attend the program at 6:30PM. There is no charge to attend the program only, but advance reservation is appreciated. Space may be limited.

Presentation:

The Martin group develops NMR instrumentation and methodology for investigating locally ordered protein networks, including membrane proteins and crystallins, the structural proteins of the eye lens. Crystallins are not crystalline but instead form large complexes exhibiting short-range order. Unlike in most tissues, protein turnover is negligible in the eye lens, requiring that the crystallins remain stable and soluble for a lifetime, which is especially remarkable given the high protein concentration in the lens. A cataract is formed when high-molecular weight crystalline aggregates accumulate in the lens, rendering it opaque. Our investigation of the molecular mechanism underlying cataract formation includes solution- and solid-state NMR as well as biophysical characterization. Structural and biophysical data will be presented for a crystallin variant in which a single amino acid substitution causes childhood-

onset cataract, as well as engineered variants designed by my group to test hypotheses about the molecular basis of protein solubility. In this system, we have found that stability and solubility are not necessarily correlated, and that aggregation can be caused either by misfolding or by disruption of intermolecular interactions.

Speaker:

Rachel Martin received her Ph.D. in physical chemistry with Kurt Zilm at Yale in 2002 and was a postdoctoral fellow with Alex Pines at UC Berkeley. She started her research program at UCI in 2005. She received the Camille and Henry Dreyfus New Faculty Award in 2005 and became a Fellow of the American Association for the Advancement of Science in 2008. Her research interests focus on development of NMR methodology for investigation of mobile solids and strongly oriented liquid crystals. Current active directions in the Martin group include building probes and designing experiments for Variable Angle Spinning (VAS) and Switched angle spinning (SAS) on biological membrane systems, deuterium NMR spectroscopy of oriented membranes, and development of stabilized membrane mimetics for NMR studies of membrane proteins.

Directions:

Take the Costa Mesa freeway (55). Exit at MacArthur Blvd. and go west (towards South Coast Plaza). Turn left at MacArthur Place. Doubletree Club Hotel is straight ahead slightly to the left. Use parking lot in front of hotel or follow signs to nearby parking. If in error you turn right at Hutton Centre Drive, you will find the Doubletree Hotel, which is not the Doubletree Club Hotel. Please be aware of the similar hotel names. Our dinner is at the Doubletree Club Hotel.