

# Improving the Study of Proteins on a Biomolecular Level



Rachel W. Martin

Associate Professor, Chemistry / Molecular Biophysics and Biochemistry,

## CURRENT RESEARCH

### Unique Biological Techniques Aid in Protein Solubility and Aggregation Research

An essential part of all living organisms, proteins perform many functions in living cells, serving as structural components and performing vital chemical reactions. And yet, the structures and functions of many proteins are still unknown. Some of the limitations in this field include problems in obtaining proteins to observe and the lack of specialized equipment necessary for experiments. Dr. Rachel Martin, Associate Professor in the department of Molecular Biology and Biochemistry at University of California, Irvine, couples a unique combination of instrument and technique development with biomedical research to closely study proteins, notably in the solubility and aggregation of proteins that make up the eye lens.

Dr. Martin and her interdisciplinary team of chemistry, molecular biology, and physics students develop new instrumentation and experimental methodology to observe how proteins work, what they look like, and what roles they play in biological systems. They particularly study the way proteins interact with water—some proteins are soluble, and others are not—because solubility is very important for a protein's biological function. Studying eye lens proteins from humans and other animals to understand how they work, Dr. Martin and her team have made important breakthroughs in understanding how inheriting a single point mutation can cause people get cataracts at age six. The Martin group builds the necessary instrumentation to solve large biological problems and applies their new techniques to biomedically relevant proteins.

Current Research Includes:

- Investigating Proteins in the Human Eye Lens - Most proteins in our bodies are being degraded and recycled all the time, a...

## AFFILIATION



University of California, Irvine

## EDUCATION

- B.S. in Chemistry 1993-1997, Arizona State University
- Ph.D. in Physical Chemistry 1997-2002, Yale University

## AWARDS

- NSF-CAREER, 2009
- Fellow of the American Association for the Advancement of Science, 2008
- Camille and Henry Dreyfus New Faculty Award, 2005

## RESEARCH AREAS

Life Science, Genomics / Congenital, Proteomics

## FUNDING REQUEST

Funding will help support the \$150K/year necessary per research project, which covers normal operating costs, supplies, experiment performance, sample preparation, instrument building, and personnel costs. Support the next generation of biomedical researchers: \$50K for a Ph.D. student and \$75K for postdoctoral student. Help fund the crucial advancement of biomolecular protein research to clearly understand their function and solve real biological issues; fund Dr. Martin.

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