



# Chemistry and Chemical Biology

## GRADUATE STUDIES AT UNIVERSITY OF CALIFORNIA, MERCED (M.S., Ph.D.)

Research in chemistry and chemical biology at UC Merced is cutting edge and highly interdisciplinary, occurring at the ever-blurring interface between chemistry, biology, physics and engineering. Our collaborative environment, coupled with strong research ties inside UC Merced and across the country, provides students with opportunities to become excellent scientists while answering challenging, topical questions.

### Graduate students work with highly motivated and active research faculty members on a diverse range of topics, including:

- › Computational and experimental studies into the structure and dynamics of biomolecules;
- › Developing methods to rapidly elucidate reaction pathways using experimental and computational techniques;
- › Integration of biological molecules with nano-electronic components for novel applications in bioelectronic interfaces, protein function control and signaling;
- › Quantify rewiring of systems biology networks in human cancer and metabolic disease using NMR spectroscopy, GCMS, functional genomics, structural and computational biology;
- › Scanning probe microscopy studies of single biomolecules, molecular scale characterization of biointerfaces for sensing, novel architectures for biointerfaces;
- › Design, discovery and investigation of new organo- and organometallic catalysts;
- › Study of organic reaction mechanism to explain chemo and stereoselective processes;
- › Development and application of density-functional theory applied to intermolecular interaction;
- › The ultrafast dynamics and spectroscopy of semiconductor nanoparticles for solar-energy conversion;
- › Discovery of new materials and nanoarchitectures for solar cells and batteries;
- › Developing electronic structure theory and molecular dynamics for modeling photochemistry.



### FUNDING OPPORTUNITIES

All doctoral students in good standing are eligible for year-round financial support, including payment of fees and tuition. Teaching assistantships normally provide initial funding, which can be supplemented by research funding, fellowships or other forms of financial assistance. In addition, travel and application fee fellowships are available for qualified applicants.

### TO APPLY

Apply online at [graduatedivision.ucmerced.edu](http://graduatedivision.ucmerced.edu). Applications are due by Jan. 15. Early admission may be granted if applications are submitted by Dec. 1.

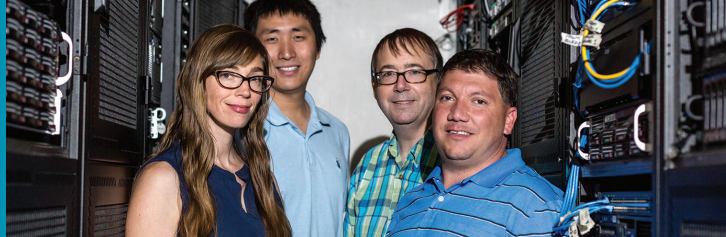
For more information, contact Admissions Chair Professor Ryan Baxter at [rbaxter@ucmerced.edu](mailto:rbaxter@ucmerced.edu).

### ABOUT UC MERCED

UC Merced is the 10th campus of the University of California system and the first new American research university of the 21st century. Merced is located in California's San Joaquin Valley, within driving distance of Yosemite National Park and the Sierra Nevada, the Bay Area and the Monterey peninsula.

# Faculty

## CHEMISTRY AND CHEMICAL BIOLOGY



### RYAN BAXTER

Design and synthesis of redox-active ligands; new strategies for organometallic catalysis from inexpensive materials; development of new synthetic methods guided by kinetic analysis.

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### MIKE COLVIN

Molecular simulations of semi-structured biomolecular systems, including intrinsically disordered proteins and chemically modified DNA.

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### FABIAN V. FILIPP

Quantifying rewiring of systems biology networks using chemical biology; NMR spectroscopy, GCMS, functional genomics, structural and computational biology.

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### HRANT HRATCHIAN

Developments in quantum chemistry and potential energy surface exploration; computational inorganic chemistry; mechanistic study and rational design of transition metal catalysts.

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### CHRISTINE ISBORN

Developing and applying electronic structure theory, molecular dynamics and QM/MM methods to the modeling of photochemistry and solvation.

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### ANNE MYERS KELLEY

Linear and nonlinear Raman spectroscopies, experiment and theory; surface enhanced spectroscopies.

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### DAVID F. KELLEY

Ultrafast dynamics and spectroscopy of semiconductor nanoparticles for solar energy conversion.

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### ANDY LIWANG

Determining the oscillating mechanism of a biological clock at the protein-structural and dynamics level using biochemistry and NMR spectroscopy.

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### PATRICIA LIWANG

Protein biochemistry and structural biology; NMR; structure and function of anti-HIV proteins and anti-inflammatory proteins.

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### ERIK MENKE

New materials and nanoarchitectures for solar cells and batteries.

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### VICTOR MUÑOZ

Conformational-functional behavior of proteins; kinetic techniques, steady state spectroscopy, nuclear magnetic resonance, single molecule studies, and high performance computing.

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### SON NGUYEN

Nanomaterials for photocatalysis; spectroscopic and mechanistic studies

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### ALEKSANDR NOY

Bionanoelectronics, biophysics, and nanofluidics; combining nanowires with membrane proteins to create electronic devices that mimic cellular transport.

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### LIANG SHI

Nanomaterials for photocatalysis; spectroscopic and mechanistic studies

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### BENJAMIN STOKES

Developing new reactions for organic synthesis; exploring organic reaction mechanisms using principals of physical organic chemistry; asymmetric metal catalysis and ligand design; drug candidate identification.

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### DAVID STRUBBE

Computational and theoretical chemistry; excited-state electronic-structure methods, amorphous materials, photovoltaics, thermoelectrics, scientific code development for high-performance computing.

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### ANAND BALA SUBRAMANIAM

Colloid and interface science, synthetic biology; Understanding biophysical processes through in vitro reconstitution, active biomimetic materials design, colloidal, polymeric, and biologically active interfaces.

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### TAO YE

Scanning probe microscopy study of interfaces; nanoscale machines on surfaces; single molecule analysis of biopolymers.

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