

# NSF-CREST Center for Cellular and Biomolecular Machines

UNIVERSITY OF CALIFORNIA, MERCED

The CREST Center for Cellular and Biomolecular Machines (CCBM) at the University of California, Merced uses an interdisciplinary approach combining physical, biological and engineering methods to understand and control the functioning of multi-scale assemblies of biomolecules and cells and to design and develop novel bio-inspired functioning machines ranging from designer cells and tissue to diagnostic and therapeutic devices.

## GRADUATE AND UNDERGRADUATE FELLOWS OF THE CENTER WILL BE ABLE TO TAKE ADVANTAGE OF :

- › an interdisciplinary graduate training emphasis in Interdisciplinary Biophysical Sciences, Biomaterials and Biotechnology (IB3) in partnership with UC Santa Barbara
- › training modules in nanobio fabrication, imaging and spectroscopy and computation and modeling
- › participation in all center activities including networking and professional development opportunities, center meetings and events, career skills workshops and more
- › entrepreneurship and K-12 school outreach opportunities
- › generous academic year and summer stipends, travel fellowships and more



### THRUST 1: BIOMOLECULAR MACHINES

Proteins are true cellular nanomachines that perform sophisticated biological functions by self-assembling into dynamic 3D structures that use thermal energy to change shape in response to specific stimuli. Amid their many functions, proteins make for excellent nanoscale instruments.

### THRUST 2: MACROMOLECULAR ASSEMBLIES AND HYBRID DEVICES

The high rate of discovery in nanotechnology is permitting us to realize nanomaterials with interesting new properties that can be used for building hybrid devices in conjunction with biomolecules. We focus on several of these applications including novel therapeutic delivery systems and nanoparticle based biosensors.

### THRUST 3: CELLULAR AND MULTICELLULAR SYSTEMS

Large scale assemblies composed of multiple cells are ubiquitous, ranging from tissue to biofilms, and exhibit striking emergent behaviors controlled by cell mechanics and cell-cell interactions. We are developing new methods to study and guide the development of bacterial communities and differentiating tissue.

University of California, Merced | 5200 N. Lake Road | Merced, CA 95343

### CONTACT

For additional details, please visit our website, [ccbm.ucmerced.edu](http://ccbm.ucmerced.edu), or contact:

#### GRADUATE INQUIRIES

**AJAY GOPINATHAN**

**EMAIL:** [agopinathan@ucmerced.edu](mailto:agopinathan@ucmerced.edu)

#### UNDERGRADUATE INQUIRIES

**SAYANTANI GHOSH**

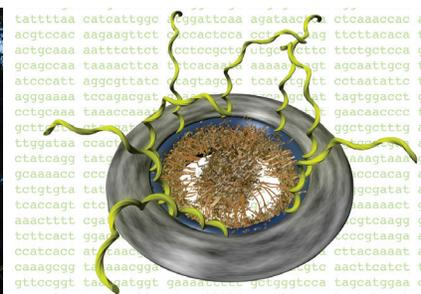
**EMAIL:** [sghosh@ucmerced.edu](mailto:sghosh@ucmerced.edu)

#### GENERAL INQUIRIES

**CARRIE KOUADIO**

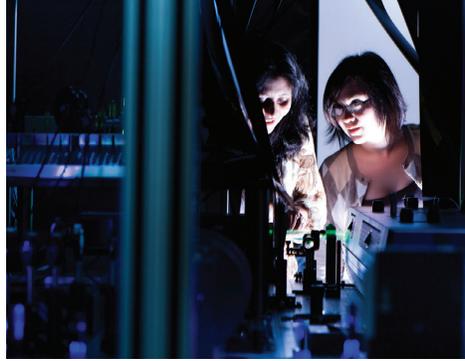
**EMAIL:** [ckouadio@ucmerced.edu](mailto:ckouadio@ucmerced.edu)

**UCMERCED**  
UNIVERSITY OF CALIFORNIA



# Faculty

## CENTER FOR CELLULAR AND BIOMOLECULAR MACHINES



**WEI-CHUN CHIN**, *biological engineering*

polymer physics and engineering of cellular and environmental systems

**MIKE COLVIN**, *chemistry and chemical biology*

models of biological processes and molecular dynamics of disordered proteins

**ARIEL ESCOBAR**, *biological engineering*

calcium in cardiac cellular signaling and techniques to study cardiac cells in vivo

**ANAND GADRE**, *stem cell instrumentation foundry*

nanotechnology, medical device development, sensor development, drug delivery

**SAYANTANI GHOSH**, *physics*

experimental condensed matter physics, magnetism, metamaterials, nanoscience and quantum systems

**AJAY GOPINATHAN**, *(co-director), physics*

theoretical biophysics, biopolymers, transport and collective behavior

**ARVIND GOPINATH**, *mechanical engineering*

fluid dynamics, polymers and active soft matter – theory and simulations

**LINDA HIRST**, *physics*

experimental soft matter physics and biophysics

**BIN LIU**, *physics*

bacterial motility in complex media and single-cell behavior in biological processes

**ANDY LIWANG**, *chemistry and chemical biology*

structural biology of circadian clock proteins and nucleic acids, NMR spectroscopy

**JENNIFER LU**, *materials science and engineering*

design and synthesis of novel functional nanomaterials

**KARA MCCLOSKEY**, *biological engineering*

stem cell and tissue engineering for regenerative medicine applications

**VICTOR MUÑOZ**, *(co-director), biological engineering*

protein folding, structure prediction and design, protein aggregation

**ANAND BALA SUBRAMANIAM**, *biological engineering*

experimental biophysics, cellular reconstitution, experimental synthetic biology

**LIN TIAN**, *physics*

theoretical quantum optics, quantum information processing and quantum simulation in condensed matter systems

**VINCENT TUNG**, *materials science and engineering*

nanotechnology for sensing and renewable energy

**JING XU**, *physics*

experimental biophysics, quantitative biology single-molecule analysis of molecular motors

**TAO YE**, *chemistry and chemical biology*

biomolecular science and engineering, nanotechnology

PRINTED ON RECYCLED PAPER  
OCTOBER 2017

