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

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

CONTACT
For additional details, please visit our website, ccbm.ucmerced.edu, or contact:

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NSF-CREST Center for Cellular and Biomolecular Machines

UNIVERSITY OF CALIFORNIA, MERCED
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