Molecular Biology Labs
Structural Biology Labs

http://biochem.med.ufl.edu/

http://idp.med.ufl.edu/about/biochemistry-and-molecular-biology/
Biochemistry and Molecular Biology Concentration

Molecular Biology Labs

Dr. Bert Flanegan – RNA virus replication
Dr. Michael Kilberg – Nutrient stress response
Dr. Thomas Yang – Epigenetic alterations in fetal alcohol syndrome
Dr. Robert Cousins – Zinc metabolism
Dr. Susan Frost – Cancer microenvironment
Dr. John Dame - Molecular biology of the malaria
Dr. Jorg Bungert – Transcriptional control of the globin locus
Dr. Kevin Brown – Signaling controlling genome stability
Dr. Michael Kladde - Regulation of transcription by chromatin
Dr. Suming Huang – Epigenetic control of genes involved in leukemogenesis
Dr. Jianrong Lu – Transcriptional and epigenetic control of EMT
Dr. Michelle Gumz – Circadian clock function
Dr. Gregory Schultz – Ocular wound healing
Dr. Andrew Berglund – Molecular mechanisms of neurological diseases
Many of our molecular biology labs have a particular interest in Epigenetics.
Courses offered within the BMB Concentration

BCH5413  Eukaryotic Molecular Biology and Genetics
BCH6415  Advanced Molecular and Cell Biology
BCH7410  Advanced Gene Regulation
BCH7412  Epigenetics of Human Disease and Development
BCH7414  Advanced Chromatin Structure

Several Journal Clubs with a wide variety of topics
Biochemistry and Molecular Biology Concentration

Structural Biology Labs

Dr. Mavis Agbandje-McKenna – ssDNA viruses

Dr. Linda Bloom – DNA repair/replication

Dr. Matthew Merritt – Metabolism by stable isotopes & magnetic resonance

Dr. Joanna Long – Membrane proteins

Dr. Thomas Mareci – Mapping central nervous system

Dr. Robert McKenna – Proteins/enzyme structures
Biochemistry and Molecular Biology Concentration
Structural Biology Labs
X-ray, EM, NMR, BIC, and National Facilities:
Courses offered within the BMB Concentration

BCH6740  Structural Biochemistry
BCH6744  Molecular Structure Determination by X-Ray Crystallography
BCH6741  Magnetic Resonance Imaging in Living Systems
BCH6745  Molecular Structure and Dynamics by NMR Spectroscopy
BCH6749  Numerical Methods in Structural Biology
BCH6107  Biophysical Techniques in Proteomics

Center of Structural Biology Seminar Series
Crystallography and cryo-electron microscopy Journal Club
Courses offered within the BMB Concentration

Biochemistry & Molecular Biology Journal Club for IDP
Theme one semester each year – student invited speaker

Faculty Research Presentations
(Wed 4:00 pm) – B&MB and invited Faculty
Eighth Shull Fellow to Focus on Biochemistry and Crystallography

February 07, 2014

Nuclear and molecular biologist Mayank Agarwal has been awarded this year’s Clifford G. Shull Fellowship. Agarwal is the eighth fellow to join the Neutron Sciences Directorate at Oak Ridge National Laboratory since the program began in 2006. Named for the 1994 Nobel Prize winner in Physics who did his early neutron scattering research at Oak Ridge from 1946 to 1955, the Shull fellowship program recruits outstanding early-career researchers who use neutrons in their field of science or engineering.

During his doctoral research, Agarwal used neutron and x-ray crystallography to study the structure and function of carbonic anhydrase (CA), a protein found in humans. CA uses hydrogen atoms to aid conversion of carbon dioxide into carbonic acid, a chemical reaction essential to many bodily functions. A number of slightly different forms of CA are found in humans. The forms Agarwal studies are targets for drug design research aimed at creating better CA inhibitors, a class of drugs that interrupts the reactions caused by CA and improves management of conditions such as glaucoma, epilepsy, and even cancer.

“My goal at ORNL is to solve various neutron structures of human CA,” Agarwal said. “This could help in developing a database of better and more specific inhibitors for human CAs.”

Like Shull—who considered the hydrogen structure in crystals a crucial area of study in neutron scattering—Agarwal uses neutrons to locate the exact position of hydrogen atoms in proteins making up CA enzymes.

“We cannot visualize hydrogen atoms in a protein structure with x-ray crystallography, but neutron diffraction is able to offer that information,” Agarwal said.

Agarwal received his PhD in biochemistry and molecular biology from the University of Florida, and his work has appeared in 16 journal publications, including Journal of the American Chemical Society, Biochemistry, and Acta Crystallographica Section D: Biological Crystallography.