PURDUE
UNIVERSITY

GRADUATE STUDIES in BIOLOGICAL SCIENCES

STRUCTURAL, BIOPHYSICAL, and COMPUTATIONAL BIOLOGY

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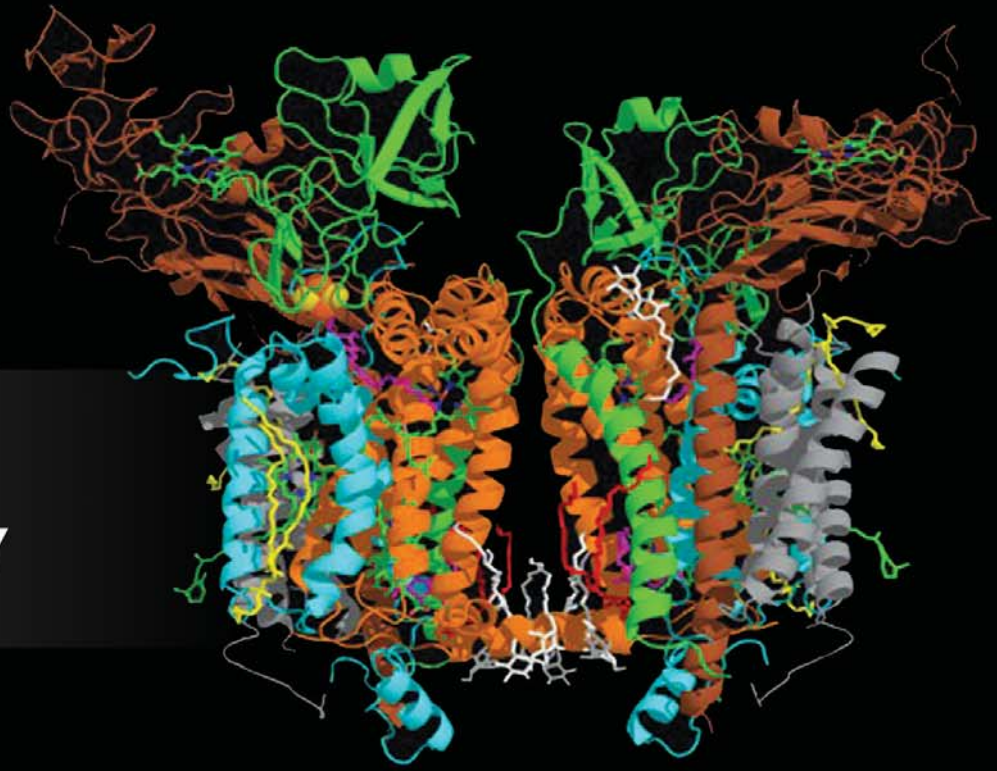

Image: Hetero-oligomeric 280 kDa cytochrome bf complex; courtesy of Cramer lab

The **Structural, Biophysical, and Computational Biology Research Area** comprises faculty with interests at the molecular level and molecular level. Research includes topics such as:

- determination of protein and nucleic acid structures
- the structure and mechanism of protein and RNA enzymes (including proteins involved in cancer)
- membrane biochemistry and the structure of membrane proteins
- structures of macromolecular complexes
- study of the structure and mechanism of viruses (including emerging pathogens such as West Nile, Dengue, and Zika)
- experimental and computational investigation of macromolecular interactions
- regulation of gene expression by epigenetic mechanisms such as chromosomal and nucleosomal structure
- the structure and function of plant cell walls and cytoskeleton response of cells to high salinity stress
- genomics, transcriptomics, proteomics, systematics, and computational systems biology and other topics at the interface of experiment and computation.

This group uses a wide variety of experimental approaches ranging from X-ray crystallography, NMR, Cryo-electron microscopy, electron tomography, and advanced spectroscopic techniques for examining and determining molecular structures, to computational techniques as they apply to nucleic acid and protein structures, bioinformatics, genomics, and systems biology including molecular dynamics, machine learning, and network analysis.

Training is provided to students with various undergraduate backgrounds ranging from biology and molecular biology to chemistry, physics, and computer science. We encourage applications from students with backgrounds outside of traditional biology programs.

Faculty and students in the group participate in a large number of interdisciplinary activities and shared resources including the **Purdue Cryo-EM Facility, Purdue Center for Cancer Research, Center for Basic and Applied Membrane Sciences, Energy Center, the Purdue Institute of Inflammation, Immunology, and Infectious Disease (PI4D), Bindley Bioscience Center**, and the **Markey Center for Structural Biology**.

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