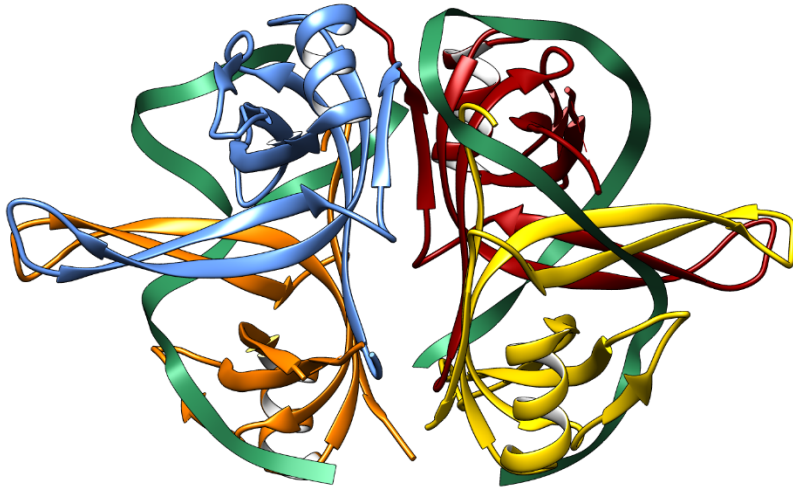


Overview:

- Participants will be introduced to a variety of methods for studying the interactions of proteins, with other proteins and various substrates, and the functions of these interactions inside cells.
- Students will get hands-on experience with a variety of complementary *in vitro* and *in vivo* techniques to study the interactions of proteins with DNA and other proteins.



Lecture Topics:

1. Introduction to protein interactions and related thermodynamics.
2. *In vitro* vs. *in vivo* assays.
3. Use of EMSA, FP, ITC, SPR, AFM, EM, and NMR to study protein interactions.
4. Fluorescence microscopy and co-localization.
5. EcSSB protein properties and recent literature.

Labs: (overlapping weeks)

1. Electrophoretic mobility shift assay (EMSA) of protein and DNA substrate to determine a dissociation constant (K_d).
2. Yeast two-hybrid to verify *in vivo* protein-protein interactions.
3. Southwestern and far Western blotting to observe protein-DNA and protein-protein interactions.
4. Chromatin immunoprecipitation (ChIP) to observe genomic localization of DNA-binding protein.
5. Fluorescence microscopy to see co-localization of labeled protein and DNA.