

## Proposed BCHM 421/422 Project Outline

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Project Title: **Structural and functional analysis of the myosin-I neck region**

Keywords (3-5): **cell motility, myosin-I, IQ motifs, structural biology, protein-protein interactions**

Project Goals:

1. Express and purify constructs encoding myosin light chains and myosin-I neck regions
2. Characterize light chain binding to IQ motifs in the myosin-I neck
3. Purify a stable myosin light chain-myosin neck complex
4. Crystallize and solve the X-ray crystal structure of the complex

Experimental Approaches:

1. DNA cloning, protein expression and purification
2. Biochemical and biophysical characterization of protein-protein interactions using isothermal titration calorimetry, pull-down assays, gel filtration, etc.
3. Protein Crystallization
4. X-ray crystallography and possibly NMR

References:

1. Langelaan, D. N., Liburd, J., Yang, Y., Miller, E., Chitayat, S., Crawley, S. W., Cote, G. P., and Smith, S. P. Structure of the single-lobe myosin light chain C in complex with the light chain-binding domains of myosin-1C provides insights into divergent IQ motif recognition. (2016) *Journal of Biological Chemistry* 291, 19607-19617
2. Liburd, J., Chitayat, S., Crawley, S. W., Munro, K., Miller, E., Denis, C. M., Spencer, H. L., Côté, G. P., and Smith, S. P. (2014) Structure of the small *Dictyostelium discoideum* myosin light chain MlcB provides insights into MyoB IQ motif recognition. *Journal of Biological Chemistry* 289, 17030-17042.