

Summer Undergraduate Research Program
Faculty Project Proposal Submission

Faculty Name:

Nicole King

Department/Organization Affiliation:

MCB

Project Name(s):

Premetazoan history of tyrosine kinase signaling

General Topic (Keywords):

choanoflagellates, evolution, tyrosine kinase signaling

Project Description(s):

Choanoflagellates are the closest single-celled relatives of animals and therefore are an excellent system with which to investigate hypotheses about the origin of animal multicellularity. Choanoflagellates and animals are the only known groups to possess tyrosine kinases, an important family of proteins involved in both intra- and inter-molecular signaling. TK signaling is involved in many 'animal-type' processes, such as development and cell-cell communication leading to coordinated cell behaviors. The function of TK signaling in choanoflagellates, however, is unknown. The student will purify an antibody made against a receptor tyrosine kinase from the choanoflagellate *Monosiga brevicollis*. This will involve a variety of protein-focused molecular biology techniques, including affinity chromatography and western blotting. The goal of the project is to discover the localization pattern of the receptor tyrosine kinase (using immunohistochemistry) and possibly to discover proteins that interact with the receptor tyrosine kinase (using immunoprecipitations). Depending on the interests of the student, there is also the opportunity to monitor the tyrosine phosphorylation profile of a colony-forming species of choanoflagellate, *Proterospongia sp*, in its various life-stages.

Desired Skills or Experience:

strong work ethic, solid background in biochemistry and molecular biology, some research experience preferred but not required

Time Commitment:

18 hrs/week during summer

Preferred Starting Date:

TBD