

Summer Student Research Program

Project Description

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PROJECT TITLE (200 Characters max):

Structure-Guided Engineering of ATM Dimer Interfaces to Dissect Functional Allostery

HYPOTHESIS:

ATM, a DNA damage checkpoint protein kinase, forms a homodimer, and its dimeric organization may contribute to the regulation of kinase activation and checkpoint signaling.

PROJECT DESCRIPTION (Include design, methodology, data collection, techniques, data analysis to be employed and evaluation and interpretation methodology)

ATM is a homodimeric kinase that plays a central role in orchestrating the DNA damage checkpoint response. While structural studies suggest that ATM exists as a dimer, the functional contribution of specific dimer interface residues to kinase regulation and signal propagation remains incompletely understood. This project will test the hypothesis that defined amino acid residues at the ATM dimer interface regulate kinase activity through structural and allosteric coupling between protomers.

SPONSOR'S MOST RECENT PUBLICATIONS RELEVANT TO THIS RESEARCH:

THIS PROJECT IS: **Laboratory and Computer analysis**

THIS PROJECT IS CANCER-RELATED: Yes
ATM mutations are associated with cancer development

THIS PROJECT IS HEART, LUNG & BLOOD- RELATED; ATM is associated with lymphoma and leukemia
Please explain Heart, Lung, Blood relevance

THIS PROJECT INVOLVE RADIOISOTOPES? No

THIS PROJECT INVOLVES THE USE OF ANIMALS: No

THIS PROJECT INVOLVES THE USE OF HUMAN SUBJECTS? No

THIS PROJECT IS SUITABLE FOR:
ALL STUDENTS

THIS PROJECT IS WORK-STUDY: **No**

**THIS PROJECT WILL BE POSTED DURING ACADEMIC YEAR
FOR INTERESTED VOLUNTEERS:** **Yes**

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WHAT WILL THE STUDENT LEARN FROM THIS EXPERIENCE?

Protein structure function; DNA damage response