

Summer Student Research Program
Project Description

FACULTY SPONSOR'S NAME AND DEGREE: *Jason H. Yang, Ph.D.*

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PROJECT TITLE (200 Characters max):

Macrophage immunometabolism in Mycobacterium tuberculosis control

HYPOTHESIS:

Macrophages play important roles in the immediate and long-term response to M. tuberculosis infection. We hypothesize that metabolic remodeling can potentiate anti-tubercular macrophage activities.

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

Both experimental and computational projects are available. Experimental activities include performing microtiter plate-based assays for metabolites and/or soluble factors secreted by macrophages activated with different biochemical agents. Computational activities include fluorescence microscopy image processing, machine learning, and/or transcriptomic analyses. Computational trainees are expected to have programming experience in Python. There are opportunities to continue beyond the summer.

SPONSOR'S MOST RECENT PUBLICATIONS RELEVANT TO THIS RESEARCH:

Yang JH, Cell Host Microbe 2017 (Pubmed ID: 29199098)

Chitale P, Nat Comm 2022 (Pubmed ID: 36400796)

IS THIS PROJECT SUPPORTED BY EXTRAMURAL FUNDS?

Yes or No

(IF YES, PLEASE SUPPLY THE GRANTING AGENCY'S NAME)

NIH NIAID

THIS PROJECT IS: Clinical Laboratory Behavioral Other

THIS PROJECT IS CANCER-RELATED

Please explain Cancer relevance

THIS PROJECT IS HEART, LUNG & BLOOD- RELATED

Please explain Heart, Lung, Blood relevance

THIS PROJECT EMPLOYS RADIOISOTOPES

THIS PROJECT INVOLVES THE USE OF ANIMALS

PENDING

APPROVED

IACUC PROTOCOL #

THIS PROJECT INVOLVES THE USE OF HUMAN SUBJECTS

PENDING

APPROVED

IRB PROTOCOL # M

THIS PROJECT IS SUITABLE FOR:

UNDERGRADUATE STUDENTS

ENTERING FRESHMAN

SOPHOMORES

ALL STUDENTS

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THIS PROJECT IS WORK-STUDY: Yes or No

THIS PROJECT WILL BE POSTED DURING ACADEMIC YEAR
FOR INTERESTED VOLUNTEERS?: Yes or No

WHAT WILL THE STUDENT LEARN FROM THIS EXPERIENCE?

Experimentalists will learn how to design, execute, and analyze quantitative high-throughput experiments in immune cells. Computationalists will learn modern computational data analysis techniques.