

Summer Student Research Program  
Project Description

**FACULTY SPONSOR'S NAME AND DEGREE:** Jason Yang, PhD

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**PROJECT TITLE (200 Characters max):**

Bioenergetic regulation of virulence in enteropathogenic bacteria

**HYPOTHESIS:**

Energy stress amplifies virulence factor production in enteropathogenic *Escherichia coli* and *Citrobacter rodentium*

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

This project will involve transforming pathogenic *E. coli* and *C. rodentium* strains with plasmids that induce energy stress and then phenotyping their metabolism and production of virulence factors.

**SPONSOR'S MOST RECENT PUBLICATIONS RELEVANT TO THIS RESEARCH:**

Li B, Srivastava S, Shaikh M, Mereddy G, Garcia MR, Shah A, Ofori-Anyinam B, Chu T, Cheney NJ, Yang JH†. Bioenergetic stress potentiates antimicrobial resistance and persistence. Nature Communications. 2025; 16:5111.

**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 INVOLVE 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

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

**THIS PROJECT WILL BE POSTED DURING ACADEMIC YEAR**

**FOR INTERESTED VOLUNTEERS:**    Yes     or    No

## Summer Student Research Program Project Description

### **WHAT WILL THE STUDENT LEARN FROM THIS EXPERIENCE?**

**The student will learn basic microbiological and molecular biology techniques and about mechanisms of bacterial physiology and virulence.**