



COLLEGE of CHARLESTON

OFFICE OF THE REGISTRAR

APPLICATION FOR INDIVIDUAL ENROLLMENT

Individual Enrollment Checklist for Student (required)

- ___ Check with academic department about regulations governing intended Individual Enrollment.
- ___ Begin a dialogue and have a commitment from the faculty supervisor at least one semester in advance.
- ___ Ensure that this form is filled out completely.
- ___ Attach a detailed project description and/or syllabus. Faculty supervisor must provide a grading rubric and a plan for assessing the student learning outcome.
- ___ Attach Degree Audit. (For Faculty Supervisor use)
- ___ Submit application to your Academic Department.

Student's Name: Jacob Goldmintz Student's ID Number: 20089971

Course ID Number: BIOL 450
(CHEM) (399) (01)

Credit Hours: 2

Year: 17

Part of Term (circle one): Fall or Spring

Faculty Supervisor: Renaud Geslain (geslainr@cofc.edu)

Project Title: Dynamic of bacteriophage tRNA expression during infection

Individual Enrollment Policies

- This form is to be completed and signed by the student, faculty supervisor, and department chair.
- Students enrolling in **HONS 399** must obtain the signature of the Honors College Dean in lieu of the department chair.
- A detailed project description and/or syllabus **must** accompany all Application for Individual Enrollment forms. The means by which the faculty supervisor will grade the course must be included in the description or syllabus and a plan for assessing the student learning outcome.
(This includes zero credit courses.)
- Lecture courses cannot be used as individual enrollment courses.
- The deadline for submission to the Office of the Registrar is the **Individual Enrollment Deadline** for the specified term.
- This is the **only** individual enrollment form that will be accepted by the Office of the Registrar.
- This form **cannot** be submitted by the student.

THE OFFICE OF THE REGISTRAR WILL NOT ACCEPT FAXED APPLICATIONS.

APPROVAL SIGNATURES (ALL SIGNATURES REQUIRED FOR PROCESSING)

Student [Signature]

Date 8/24/17

Faculty Supervisor [Signature]
(Include a Syllabus and a Plan for Assessing the Student Learning Outcome)

Date 8/24/17

Chair of Department or Dean of Honors College [Signature]

Date 8/24/2017

Office of the Registrar [Signature]

Date

09/08/16

BIOL450: 2 credits

Student: Jacob Goldmintz – ID#20089971

Title: Dynamic of bacteriophage tRNA expression during infection

Mentor: Renaud Geslain (CofC, Biology) - geslainr@cofc.edu - 843-953-8080

Background: Transfer RNAs (tRNAs) are small non-coding RNAs expressed in all living organisms. They are essential components of the translation machinery and are responsible for the synthesis of proteins from messenger RNAs. Viruses are obligate parasites that evolved to minimize the size of their genome. As a result, they don't encode any elements of the translation machinery and hijack the host's tRNAs and ribosomes for the synthesis of viral proteins. With only 49 kilobases, the genome of the bacteriophage D29 is extremely compact. This virus specifically infects *Mycobacterium smegmatis*, a nonpathogenic bacterium often used as a model organism to study tuberculosis. Interestingly, D29 encodes five different tRNA genes. We suspect that these viral tRNAs are expressed during infection to complement the cellular machinery and boost the expression of viral proteins.

Objectives: Jacob's project aims, for the first time, at demonstrating that bacteriophage tRNAs are synthesized and incorporated in the host's translation machinery. He will monitor bacterial and viral tRNAs expression using a novel microarray platform that he helped implementing in the lab.

Specifically, he will:

- Infect *M. smegmatis* with D29
- Label bacterial and viral tRNAs *in vivo*
- Extract labeled tRNAs
- Print custom *M. smegmatis*/D29 tRNA microarrays and hybridize them with extracted tRNA samples
- Analyze array data and generate tRNA profiles
- Investigate potential correlation between viral tRNAs and viral proteins via computational analysis

Learning outcomes:

In this course, Jacob will demonstrate his ability to:

- Set up, operate and manage a bacteriophage tRNA microarray platform
- Design and perform microbial cultures and infections
- Analyze data
- Review relevant literature

Grading:

- 70%: Set up and operation of a functional bacteriophage tRNA platform
- 10%: Manage supplies and maintain equipment
- 10%: Overall commitment to the project
- 10%: Interaction with other students in the lab

Grading scale:

