BCHM 421/422 – 2018/2019

Project Outline: This project will follow a multidisciplinary approach to investigate how bacteria produce biologically active and useful organic molecules. Bacteria have the potential for the synthesis of many molecules encoded in their genomes in the form of gene clusters, however, when the organisms are grown in a laboratory setting many of these gene clusters are not functionally expressed and the molecules are not made. This project will use a combination of specialized culturing conditions and molecular cloning techniques to attempt to turn on the expression of the gene clusters to facilitate isolation of the encoded molecules. This then allows in depth investigation of the biosynthetic mechanisms involved with molecule production.

Supervisor: Dr. Avena Ross (Chemistry)

Project Title: Isolation and Investigation of the Biosynthesis of Natural Products from marine bacteria

Keywords (3-5):

1. **Microbial Biosynthesis**
2. **Molecule isolation**
3. **Structure Elucidation**
4. **Enzymology**

Project Goals: Detection and purification of natural product molecules from marine bacteria
Structure Elucidation
Cloning of genes and gene clusters from marine bacterial genomes

Experimental Approaches:
Bacterial Cultivation
Molecule extraction and purification using chromatographic techniques
Structure determination using Mass Spectrometry and NMR
Molecular cloning techniques

References:
Timmermans, M. L., Paudel, Y. P., Ross, A. C., Investigating the Biosynthesis of Natural Products from Marine Proteobacteria: A Survey of Molecules and Strategies, *Mar. Drugs*, **2017**, *15*, 235