

**CONCORDIA UNIVERSITY**  
**DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY**  
**CHEMISTRY 498/670**  
**BIOSYNTHESIS**  
**COURSE INFORMATION**

**COURSE FORMAT:** Lectures ONLY.

**INSTRUCTOR:** Brandon Findlay  
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**OFFICE HOURS:** By appointment only.

**OUTLINE:** Focusing on compounds with historical and medicinal value, this course will examine the biosynthesis of complex organic molecules by bacteria, fungi, plants and animals.

This biochemistry course may serve as an organic chemistry replacement.

**PREREQUISITES:** CHEM 324 and CHEM 375. Students may not take both this course and CHEM 498/670 – Secondary metabolism for credit.

**GRADING:**

Class participation	5%
Presentation	20%
Midterm Exam	25%
Final Exam	50%

**PRESENTATIONS:** Each student will give a 20-25 minute presentation on a key advance touching on course material, either in pairs (undergraduates) or alone (graduate students). Students will be evaluated on the quality of their talk and their response to questions from the audience. Asking questions and providing constructive feedback on student presentations will contribute to a student's participation grade.

**TENTATIVE LECTURE SCHEDULE**

Week 1  
Introduction

Week 2  
Isoprenoids and radiolabeling

Week 3  
Steroids  
Tailoring reactions: Oxidation  
Intro to alkaloids

Week 4  
Alkaloids

Week 5  
RiPPs  
Complex human natural products  
Tailoring reactions: SAM

Week 6  
Intro to polyketides

Week 7  
Midterm

Week 8  
PKS structural biology (powerpoint)  
Polyethers

Week 9  
Non-ribosomal peptides

Week 10  
Modifying enzymes: Glycosylases  
Aminoglycosides  
Phenylpropanoids

Week 11  
Mixed domains: NRPS-PKS hybrids, Isoprenoid indole alkaloids, etc.

Week 12  
Isolation of natural products (techniques)  
Induction of natural product biosynthesis

Week 13  
Heterologous expression  
Pathway engineering  
Wrap-up and review