

Chemistry of Natural Products

Spring 2026

Time and Place: IBC, dates and times as indicated below

Instructor: Dr. Neil Schore

Phone: 530-304-6794

E-mail: neschore@ucdavis.edu

Office Hours: After lectures and upon request

Course website: Please check Canvas for course updates and handouts

Course Description and Objectives:

This course introduces the chemistry, biosynthesis, and pharmacological activity of natural products. It will cover topics in the first five chapters of the Dewick textbook. Emphasis will be placed on the key biosynthetic pathways responsible producing biologically active secondary metabolites. Upon completion of this course, students should be familiar with the chemistry principles underlying the biological processes that produce polyketides, phenylpropanoids, terpenoids, and steroids in nature. Students should be able to examine the structure of a natural product and recognize its key biosynthetic pathways and building blocks. Students should also become familiar with literature searching and proper use of references.

Prerequisite: One year of undergraduate organic chemistry lecture, or Dr. Schore approval

Text Book: Paul M. Dewick “Medicinal Natural Products: A biosynthetic approach”
3rd Edition, John Wiley & Sons Ltd, 2009

Additional reading will be distributed in class or posted on Canvas.

Grading:

Attendance and Participation	100 pts
Take Home Quizzes (3 × 100 pts)	300 pts
TOTAL	400 pts

Attendance & Participation: Full credits are given for those who attend all lectures punctually and participate actively when called on during lecture.

Take Home Quizzes: You may use your notes and the textbook, and you may work with your classmates on the quizzes, but you must turn in your own work in hard copy by the specified deadline.

Students who miss quizzes for a legitimate reason may be given a grade of “incomplete,” provided that the student has a passing grade before the final. Criteria for incompletes are detailed here:

<http://catalog.ucdavis.edu/academicinfo/grades.html>

Lecture Topics:

Introduction

Building blocks and construction mechanisms – From a chemist’s point of view

The acetate pathway – Fatty acids and polyketides

The shikimate pathway – Aromatic amino acids and phenylpropanoids

The mevalonate and methylerythritol phosphate pathways – Terpenoids and steroids

Additional Reading:

- 1) *Strategic Applications of Named Reactions in Organic Synthesis*, L. Kürti & B. Czako (2005).
- 2) *Chemical Aspects of Biosynthesis*, Mann, J. (1995).
- 3) *The Billion Dollar Molecule*, B. Werth (1995).
- 4) *Quinine: Malaria and the Quest for a Cure That Changed the World*, F. Rocco (2003)
- 5) *Natural Product Chemistry: A Mechanistic, Biosynthetic and Ecological Approach*, Kurt B. G. Torssell (1997)
- 6) *Natural Product Chemistry at a Glance*. Stephen P. Stanforth (2006)

Other Sources:

Connecting from off campus for electronic journals at UC Davis:

<https://www.library.ucdavis.edu/ul/services/connect/>

SciFinder Search at ACS site: <https://origin-scifinder.cas.org/scifinder/login>

PubMed Search at NCBI site: <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=PubMed>

Chemical & Engineering News: <http://pubs.acs.org/cen/index.html>

A special issue: Top Pharmaceuticals <http://pubs.acs.org/cen/coverstory/83/8325/index.html>

Tentative Class Schedule (Subject to change)

Time: 09:00-12:00

Venue: O108, Old Building, IIS, AS (on 3/12, please go to N107, Old Building, IIS, AS)

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| 1. Mar 10 | (T) | Syllabus
Chapter 1. Introduction
Chapter 2. Building blocks and construction mechanisms: from a chemist's point of view
Quiz #1-- Available at Canvas |
| 2. Mar 12 | (Th) | Chapter 3. The acetate pathway: fatty acid and polyketides |
| 3. Mar 16 | (M) | Quiz #1 due to Dr. Schore by 10 am in IBC |
| 4. Mar 17 | (T) | Chapter 3 continued
Quiz #2-- Available at Canvas |
| 5. Mar 19 | (Th) | Chapter 3 continued |
| 6. Mar 23 | (M) | Quiz #2 due to Dr. Schore by 10 am in IBC |
| 7. Mar 24 | (T) | Chapter 4. The shikimate pathway: aromatic amino acids and phenylpropanoids
Quiz #3-- Available at Canvas |
| 8. Mar 26 | (Th) | Chapter 5. The mevalonate (MVA) and methylerythritol phosphate (MEP) pathways |
| 9. Mar 30 | (M) | Quiz #3 due to Dr. Schore by 10 am in IBC |