

Marine Natural Products (SIO 124)
4 units, Winter 2020
T/TH 8:00-9:20, 222 Center Hall
Instructor: Paul Jensen
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Office hours (by appointment) rm 201 Kaplan Lab, 8645 Discovery Way, SIO
TA: Mitchell Muskat (mmuskat@ucsd.edu)

Overview: This course will provide a detailed introduction to marine natural products (MNPs). It is geared for upper level undergraduates who are interested in gaining a fundamental understanding of the field. It begins with an historical perspective on marine natural products, their medicinal uses, and an overview of some of the most important marine compounds that have been developed into drugs. We will cover the methods used to collect samples and relevant legal issues including patent law. We will work through various groups of organisms that have been a rich source of marine natural products touching on the types of molecules produced by each. We will then explore the ecological functions of these compounds and how this information can aid discovery efforts. The methods used to isolate and characterize marine natural products will be covered along with the mechanisms that govern their biosynthesis. The latter is particularly relevant to the latest “omic” approaches to natural product discovery, which will also be addressed. Finally, the methods used to assess the biological activity of natural products will be presented along with their use as research tools. Grades will be assigned based on quizzes (20%) and two exams (40% each).

Module 1:

Introduction to marine natural products (MNPs)

Module 2:

Sample collection, processing, legal issues

Module 3:

Biodiversity

Module 4:

Seaweeds

Module 5:

Invertebrates

Module 6:

Microorganisms

Module 7:

Chemical ecology (Alyssa Demko)

Module 8:

Isolation and structure elucidation

Module 9:

Biosynthesis

Module 10:

Bioassays, molecular targets, MNPs as research tools.

Midterm: February 6, 2020 (40%)

Finals week: exam (40%)