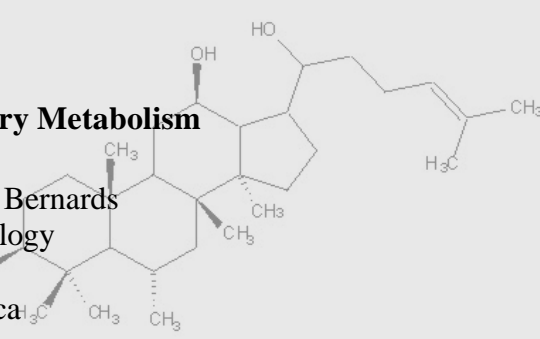


Biology 407b Plant Secondary Metabolism 2004

Instructor: Dr. Mark A. Bernards
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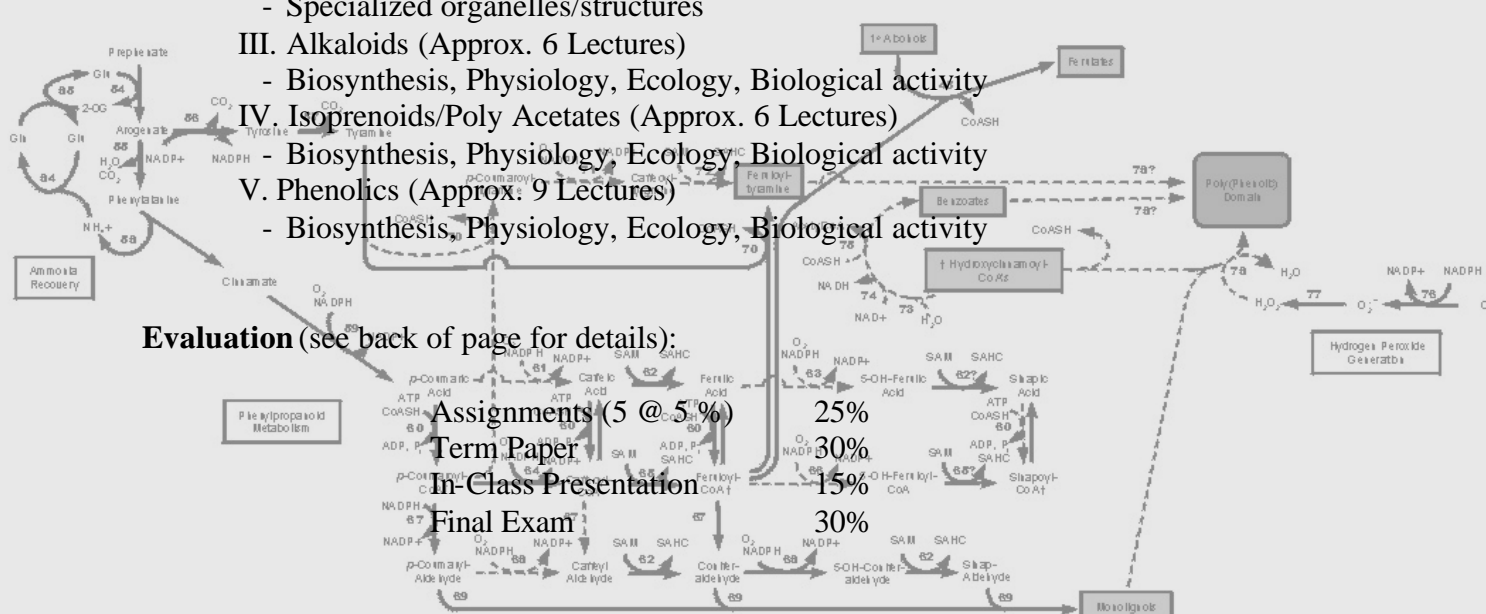
Calendar Description
A study of the role and biosynthesis of the diverse array of secondary natural products produced by plants. Secondary metabolites are divided into three main classes: alkaloids, isoprenoids/poly acetates and phenolics. For each class, the biosynthesis, physiology, ecology and biological activity of representative compounds will be discussed.

Prerequisites: Biology 305a and admission to year four of an Honors Program or Diploma in Honors Standing Program in Biology or the other Life Sciences, or permission of the instructor.
3 lecture hours, half course

Class Times: Monday, 09:00, B&GS 116
Wednesday, 10:00, B&GS 116
Friday, 11:00, B&GS 116

Topic Outline:

- I. Plant Secondary Metabolism (Approx. 2 Lectures)
 - Introduction & Ecological perspectives
- II. Biosynthesis of Secondary Metabolites (Approx. 9 Lectures)
 - Basic organic chemistry of biosynthetic reactions
 - Pathway organization
 - Specialized organelles/structures
- III. Alkaloids (Approx. 6 Lectures)
 - Biosynthesis, Physiology, Ecology, Biological activity
- IV. Isoprenoids/Poly Acetates (Approx. 6 Lectures)
 - Biosynthesis, Physiology, Ecology, Biological activity
- V. Phenolics (Approx. 9 Lectures)
 - Biosynthesis, Physiology, Ecology, Biological activity



Evaluation (see back of page for details):

Assignments (5 @ 5%)	25%
Term Paper	30%
In-Class Presentation	15%
Final Exam	30%

Assignments:

Five take-home assignments (each worth 5% of the final grade) will be given out during the term. The assignments will consist of one or more questions related to material covered in class, and will require brief written answers (i.e., 1-2 pages). Assignments will be due according to the following schedule:

Assignment No.	Topic	Available Date	Due Date
1	Ecological Perspectives	Jan. 09, 2004	Jan. 16, 2004
2	Biosynthesis	Jan. 26, 2004	Feb. 02, 2004
3	Alkaloids	Feb. 11, 2004	Feb. 18, 2004
4	Isoprenoids	March 03, 2004	March 10, 2004
5	Phenolics	March 24, 2004	March 31, 2004

Term paper (Due Monday March 22, 2004):

The term paper will consist of a 10-15 (double-spaced) page essay written about a specific enzyme, pathway or natural product (secondary metabolite) of your choice. For example, you might write a mini-review about the current status of a biosynthetic pathway. Alternatively, you might write a paper describing the elucidation of the mechanism of a specific enzyme, or the ecology of a specific compound (or indeed class of compounds) in the interaction between a plant and its environment. Another area of interest may be the engineering of a pathway to either enhance or suppress the biosynthesis of a target phytochemical. In this context, however, the emphasis would need to be on the enzyme, pathway and/or product, and not the molecular biology associated with the plant transformation used.

You are encouraged to discuss your topic with the instructor early in the term.

Presentations:

You will present a 20-minute talk to the class on the topic you have written your term paper on. Presentations will be held during the last few scheduled class periods (2 per class). The order of presenters will be determined by consensus.