# Chemistry IV (Organic): Biosynthesis

## Overview (2014-15)

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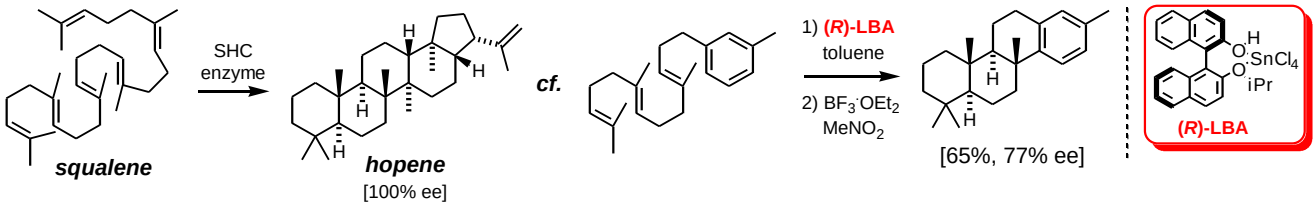
**Aims:**
To briefly review primary metabolism and enzyme co-factor chemistry. To examine the formation of the major classes of secondary metabolites: shikimate derivatives, alkaloids, fatty acids, polyketides and isoprenoids. To present the chemical mechanisms of many of these transformations, and to demonstrate how these natural processes can provide inspiration for the total synthesis of natural products and un-natural analogues.




***Building Upon:*** All Prior organic core courses in years 1-3; in particular year 2 course on 'Bio-organic Chemistry'
***Looking forward to****:* A deeper understanding of the origins of natural substances which are used in medicines, cosmetics, food additives, dyes and other daily encountered substances.

**Summary:**
A tour of natural product biosynthesis and biomimetic total synthesis.

**Objectives:**
On completion of this course you will be able to:

- recognise the structural affinities of major classes of natural products;
- appreciate the biological and chemical origins of these compounds;
- offer rational mechanistic explanations for many of the transformations;

**Course delivery (8 lectures + 1 problem class)**

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| **Lecture 1:** | Introduction to course, primary metabolism and enzyme cofactor chemistry. |
| **Lecture 2:** | Biosynthesis of Shikimate metabolites. |
| **Lectures 3-4:** | Biosynthesis and biomimetic synthesis of alkaloids. |
| **Lectures 5-6:** | Biosynthesis and biomimetic synthesis of fatty acids and polyketides. |
| **Lectures 7-8:** | Biosynthesis and biomimetic synthesis of isoprenoids. |
| **Problem class:** | Review of content and summary of most important concepts. |

**Reference material**
The following texts contain information pertinent to the course content.

1. Mann *Chemical Aspects of Biosynthesis* Oxford Chemistry Primer No. 20, **1994**.
2. Mann *Secondary Metabolism* OUP, 2nd ed. **1987**.