

# **Organic Chemistry**

**With a Biological Emphasis**

**Volume I: Chapters 1-9**

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# Introduction

As you begin a course in organic chemistry, you probably have many questions. Here are my attempts to answer a few of the questions that you are most likely to be wondering about.

## **What is organic chemistry, and why do I need to study it?**

As you probably already know, organic chemistry is defined as the study of molecules that contain the element carbon. If you are interested in the science of living things, then you are also interested in organic chemistry - organic molecules and the reactions they undergo form the basic currency of life on earth. You cannot understand how a human cell breaks down carbohydrate or fat for energy without gaining a solid understanding of the basic processes of organic chemistry that underlie these metabolic events. You cannot appreciate how drugs work, on a molecular level, until you have first learned about the three dimensional structure of organic molecules and how different organic 'functional groups' interact with one another. And if you don't know your organic chemistry, you will have difficulty understanding and explaining the molecular underpinnings of diseases such as depression, cancer, or diabetes.

The relevance of organic chemistry is not restricted to the study of living systems, however. You need a firm grasp of the subject to understand many ongoing developments in renewable energy, nanomaterials, environmental clean-up, and drug development and regulation, just to name a few examples. Society always has - and probably always will - need people who know how to synthesize, analyze, and break down organic molecules in useful ways, and this need translates to rewarding careers with good salaries and working conditions.

## **How is organic chemistry going to be different from general chemistry?**

Depending on your experience with general chemistry, you may be pleased (or dismayed) to learn that most students find organic chemistry to be an entirely new breed of beast. It is common to see students, who felt very much at home with general chemistry, struggle with organic – and vice versa.

To begin with, an introductory course in organic chemistry tends to focus much more on the qualitative than it does on the quantitative (translation – there much less math!) But don't get too comfortable just yet – despite its scarcity of math, you undoubtedly are aware that very few people find organic to be an easy course. In fact, many science and pre-health majors report that it was for them the single most challenging part of their undergraduate career. You are going to be asked to take in and digest a lot of new

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