

SECTION OVERVIEW

6: Principles of Toxicology

Introduction

ToxTutor is a self-paced tutorial covering key principles of toxicology and was adopted from the National Library of Medicine (NLM) chemical and toxicology databases. While a knowledge of anatomy and physiology is not required for viewing ToxTutor, the [Introduction to the Human Body](#) from the National Cancer Institute provides a good introduction to the topic.

Topics Covered in this Course

ToxTutor is divided into the following sections:

Section 1: Introduction to Toxicology

- 1.1: What is toxicology?
- 1.2: Basic Terminology

Section 10: Absorption

- 10.1: Introduction to Absorption
- 10.2: Gastrointestinal Tract
- 10.3: Respiratory Tract
- 10.4: Dermal Route
- 10.5: Other Routes of Exposure

Section 11: Distribution

- 11.1: Introduction to Distribution
- 11.2: Influence of Route of Exposure
- 11.3: Disposition Models
- 11.4: Structural Barriers to Distribution
- 11.5: Storage Sites

Section 12: Biotransformation

- 12.1: Introduction to Biotransformation
- 12.2: Chemical Reactions
- 12.3: Biotransformation Sites
- 12.4: Modifiers of Biotransformation

Section 13: Excretion

- 13.1: Introduction to Secretion
- 13.2: Urinary Excretion
- 13.3: Fecal Excretion

- 13.4: Exhaled Air
- 13.5: Other Routes

Section 14: Cellular Toxicology

- 14.1: Adaptation
- 14.2: Cell Damage and Tissue Repair
- 14.3: Cancer
- 14.4: Neurotoxicity

Section 15: Intuitive Toxicology and Risk Communication

- 15.1: Intuitive Toxicology
- 15.2: Risk Communication

Section 16: Environmental Toxicology, Environmental Health, and One Health

- 16.1: Environmental Toxicology
- 16.2: Environmental Health
- 16.3: One Health

Section 17: Conclusion

Section 2: Dose and Dose Response

- 2.1: Dose and It's Impact on Toxicity
- 2.2: The Dose Response Relationship
- 2.3: Dose Estimates of Toxic Effects
- 2.4: Determining the Safety of a Drug
- 2.5: NOAEL and LOAEL

Section 3: Toxic Effects

- 3.1: Types of Toxic Effects
- 3.2: Factors Affecting Toxicity
- 3.3: Systemic Toxic Effects
- 3.4: Organ Specific Toxic Effects

Section 4: Interactions

- 4.1: Interactions

Section 5: Toxicity Testing Methods

- 5.1: Testing and Assessing Toxicity
- 5.2: Clinical Investigations and Other Types of Human Data
- 5.3: Epidemiology Studies

Section 6: Risk Assessment

- 6.1: Risk Assessment
- 6.2: Hazard Identification
- 6.3: Dose-Response Assessment
- 6.4: Exposure Assessment

Section 7: Exposure Standards and Guidelines

7.1: Exposure Standards and Guidelines

7.2: Regulation of Consumer Products and Drug Safety

7.3: Environmental Exposure Standards/Guidelines

7.4: Occupational (Workplace) Exposure Standards/Guidelines/Approaches

Section 8: Basic Physiology

8.1: Introduction to Basic Physiology

8.2: Homeostasis

8.3: Organs and Organ Systems

8.4: Tissues

8.5: Cells

8.6: Chemicals

Section 9: Introduction to Toxicokinetics

9.1: What is Toxicokinetics

Each section of ToxTutor contains one or more related content pages. *Next* and *Back* buttons are provided to allow you to navigate through these pages. For more information, see the "Getting Around" section below.

The basic principles of toxicology described in ToxTutor are similar to those taught in university programs and are well described in toxicology literature. A list of the textbooks used as the primary resources for the tutorials is found in the [Bibliography](#).

Using ToxTutor

Getting Around

It will take approximately three hours to complete this self-paced tutorial.

There are a variety of ways you can navigate ToxTutor. You can:

- Use the [Glossary](#) button in the upper right corner of each page to access the [glossary](#).
- Click the links in the list above (or any underlined words in any module which are linked) to access sections directly.
- Click the Previous and *Next* links at the bottom of each page to move through the material.
- Use a combination of the above methods to explore the course contents.

Progress

At the top of each page in ToxTutor are links indicating where the current page falls within the overall ToxTutor program. You can click these links to return to this homepage or to the section that contains the page.

Links

Throughout the course, you will encounter links. Any link to a resource outside of ToxTutor, will typically open in a new tab or window. All other links are to other areas within ToxTutor. Links are bold and underlined as seen [here](#) and [here](#).

In addition, clicking on some images may open another external website for more information.

Credits

ToxTutor was adopted from the [U.S National Library of Medicine](#) in 2021. More Information can be seen in the ToxTutor [Bibliography](#).

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