

IMMUNOTOXICOLOGY

MODULE DESCRIPTION/OVERVIEW

Immunotoxicology is a relatively new discipline, the purpose of which is to detect and characterize the potentially adverse immunomodulatory effects of xenobiotics and environmental contaminants, chemicals, physical agents (i.e., UV light, radiation) and pharmaceuticals in toxicological hazard identification and risk assessment.

Module Learning Objectives

- 1) *To familiarize participants with knowledge about the Relevance, consequences, main mechanisms, testing for immunotoxicity and immunotherapy.*
- 2) *To recognize the main mechanisms of immunotoxicity , immunotherapy and biomarkers of immunotoxicity*

MODULE INTENDED LEARNING OUTCOMES

Upon successful completion of this module, students will be able to:

A- KNOWLEDGE AND UNDERSTANDING: (REMEMBERING AND UNDERSTANDING)

- A1- *Identify the general principles and terminology of immunotoxicology*
- A2- *Identify clinical and epidemiological aspects of immunotoxicity*
- A3- *Name factors affecting susceptibility for immunotoxicity*
- A4- *Explain modes of action of selected immunotoxins*
- A5- *Discuss regulatory aspects of immunotoxicity*
- A6- *Identify innovative developments in immunotoxicity testing*
- A7- *Discuss Environmental toxicity, food safety and its impact on human health*
- A8- *List immunotoxicology tests*

Intellectual Skills: (Application, Analysis, Synthesis, Evaluation)

- B1- *Apply immunotoxicity data in risk assessment and developmental immunotoxicology*
- B2- *Differentiate between different types of immunotherapy*

B3- Evaluate the major specific aspects of immunotoxicology, i.e., immunosuppression, allergy, and autoimmunity

C-PROFESSIONAL SKILLS: (PRACTICAL SKILLS)

C1- Combine information technology to improve his/her professional practice

C2- practice immunotoxicity testing using different techniques including in - vivo/in-vitro models

C3- Calculate immunotoxic drug lethal doses

D-GENERAL SKILLS: (ATTITUDES AND COMMUNICATION SKILLS)

D1- Display self appraisal and seek continuous learning.

D2- Follow different sources of information to obtain data.

D3- Collaborate as team leader as well as a member of large team

D4- Contribute in scientific meetings

D5-Organize time appropriately .

D6- Adopt safety measures while immunotoxicity testing

D7- Adopt ethical principles while immunotoxicity testing

MODULE RESOURCES

Required Module Textbooks and Materials

1. Hastings, K.L., 2018. Immunotoxicology: A brief history. *Immunotoxicity Testing*, pp.3-13.
2. Methods in Immunotoxicology [Burlison, Dean, and Munson, Eds.] Wiley-Liss. Annual Reviews of Pharmacology and Toxicology
3. Biologic Markers in Immunotoxicity National Research Council, National Acad. Press.
4. Pieters R, Laan JW, Loveren HV. Immunotoxicology. In Nijkamp and Parnham's Principles of Immunopharmacology 2019 (pp. 787-818). Springer, Cham.

5.

Optional Module Textbooks and Materials

<https://www.sciencedirect.com/bookseries/immunotoxicology-of->

[drugs-and-chemicals-an-experimental-and-clinical-approach/vol/1/suppl/C](#)

6-Pieters R, Laan JW, Loveren HV. Immunotoxicology. In Nijkamp and Parnham's Principles of Immunopharmacology 2019 (pp. 787-818). Springer, Cham.

7- Gallucci R, Lockett-Chastain L, Yucesoy B. Immunotoxicology. In An Introduction to Interdisciplinary Toxicology 2020 Jan 1 (pp. 233-244). Academic Press.

8- Vlata Z, Corsini E, Tsatsakis AM. Modern aspects of immunotoxicology. In Toxicological Risk Assessment and Multi-System Health Impacts from Exposure 2021 Jan 1 (pp. 233-245). Academic Press.

9- Fukuyama T, Tajiki-Nishino R. Pesticide and Immunotoxicology. In Allergy and Immunotoxicology in Occupational Health-The Next Step 2020 (pp. 183-195). Springer, Singapore.

10- Anderson SE, Shane HL. Investigative immunotoxicology. Immunotoxicity Testing. 2018:27-46.

11- De Boer A, Krul L, Fehr M, Geurts L, Kramer N, Urbietta MT, Van Der Harst J, Van De Water B, Venema K, Schütte K, Hepburn PA. Animal-free strategies in food safety & nutrition: What are we waiting for? Part I: Food safety. Trends in Food Science & Technology. 2020 Dec 1;106:469-84.

ASSIGNMENTS AND GRADING SCHEME

GRADING SYSTEM

- Diagnostic:** level assessment before the course
- **Formative:** quiz, interaction during demonstrations given periodically during course
- **Summative:** at the end of the course duration.
 - Written theoretical multidimensional exams with MCQ, SAQ, problem solving and True or False to assess student knowledge & understanding as well as intellectual abilities
- Assignments
- e-Portfolio
- Practical exam(OSPE)