Hanze

Course: Drug Discovery — credits: 5

Course code	LSVX24MEDICIJN
Name	Drug Discovery
Study year	2025-2026
ECTS credits	5
Language	Dutch, with parts in English
Coordinator	E.M. Geertsema
Modes of delivery	Lecture Project-based learning
Assessments	Drug development - Other assessment

Learning outcomes

This module has the following learning outcomes:

- You will explain the definition of a drug and describe key events and developments in the history of modern drug development.
- You describe the application of bioinformatics tools in drug development and analysis and demonstrate how a drug works at the molecular level using a bioinformatics tool.
- You describe acquired knowledge about various analytical techniques in the pharmaceutical industry and link methods to specific drugs using relevant literature.
- You identify and name, based on the chemical structure and interactions with the target, the chemical characteristics of a drug, such as functional groups, pharmacophores, chiral centers, types of intermolecular interactions and hydrogen bond donors/acceptors. You assess whether the drug meets the Lipinski rule of five and determine whether it is a prodrug, including the type of prodrug.
- You describe the pharmacokinetics of drugs, including absorption, distribution, metabolism and excretion, and understand the pharmacodynamics of drugs, including action and side effects.
- You will describe various types of in vitro screening used in the preclinical phase and explain in a simple manner the application of biological models in the testing of new drugs.
- You present classically from an interdisciplinary joint and convincing manner the acquired knowledge and application of the specifically chosen drug, informing the audience jointly and each from each domain expertise about the genesis, application as well as all appropriate technically-relevant areas of knowledge of the drug.

Content

What are drugs and how does one develop a drug?

Developing a drug is a long process in which much research must be done on the target of the drug, making a powerful drug, what the drug does to the body and what the body does to the drug. The analysis of the research data used and made is crucial in this development process. Thus, drug development is multidisciplinary research where biologists, chemists and bioinformaticians work together to create a new drug.

This module will introduce students to the basics of how a drug is developed, and how the various disciplines, taught within ILST, contribute to it. Different lecturers from different programs will give lectures explaining the contribution of the respective disciplines in drug development through concrete examples. The knowledge gained in the lecture is then directly applied in a partial assignment

For the assignment, multidisciplinary project groups are formed (i.e. consisting of students from different courses). The project groups must choose a drug, from a list of existing drugs compiled by the lecturers. The concepts taught must be applied to the chosen drug, and this will require some literature review. This must be done for each subject taught. The results of the subtasks will then be “compiled” into a final presentation in which the project groups present how the all disciplines were applied in the development of the drug.

Included in programme(s)

Major Biology and Medical Research
Bio-Informatics
Chemistry
Major Medical Diagnostics
Chemical Engineering

School(s)

Institute for Life Science & Technology

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