

CH-317

**Drug discovery and development**

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Cursus	Sem.	Type
Chemistry	BA6	Obl.
HES - CGC	E	Opt.

Contact language	English
Credits	2
Session	Summer
Semester	Spring
Exam	Written
Workload	60h
Weeks	14
<b>Hours</b>	<b>2 weekly</b>
Lecture	2 weekly
<b>Number of positions</b>	

**Summary**

This course discusses the molecular basis of diseases and how drugs work. Concepts and processes employed in today's drug discovery and development are covered. The first part of the course focuses on small molecule drugs and the second one on biotherapeutics.

**Content**

Lectures 1-5: The following five major disease areas as well as small molecule therapeutics applied to treat the diseases are discussed:

- cancer
- cardiovascular diseases
- neurologic disorders
- infectious diseases
- inherited diseases

Lectures 6-13: The following therapeutic formats being mostly biologics are discussed:

- blood and blood components
- enzymes
- hormones
- cytokines
- monoclonal antibodies
- antibody fragments and mimics
- macrocycles
- peptides and peptidomimetics

**Keywords**

pharmacological chemistry, drug discovery, biotherapeutics, biologics, small molecule drugs

**Learning Prerequisites****Required courses**

Basic knowledge in chemistry and biochemistry

**Learning Outcomes**

By the end of the course, the student must be able to:

- Describe molecular basis of diseases

- Describe small molecule drugs and biotherapeutics and their mechanism of action
- Recall drug development strategies that are discussed as case studies

### Teaching methods

Each week, one of the above described topics is presented in a lecture (45 minutes) and a research paper is discussed (45 minutes).

### Expected student activities

The students read each week a research paper and answer questions that are provided (at home). The students participate in the discussion of the paper in the lecture.

### Assessment methods

Written exam

### Resources

#### Notes/Handbook

The following materials are provided on Moodle:

- PPT presentation of the lectures and the case studies
- Research papers
- Questions about research papers

#### Moodle Link

- <https://go.epfl.ch/CH-317>