

BIO-698

The making of an innovative medicine

Clerc Roger G.

Cursus	Sem.	Type
Biotechnology and Bioengineering		Opt.
Computational and Quantitative Biology		Opt.
Molecular Life Sciences		Opt.

Language of teaching	English
Credits	2
Session	
Exam	Oral presentation
Workload	60h
Hours	28
Courses	14
Exercises	14
Number of positions	25

Frequency

Every year

Remark

Next time : Fall 2025

Summary

To expose participants to translational biomedical research (from bench to bedside and back) and drug discovery.

Content

Through a logical series of presentations both from the participants and the lecturer (flipped classroom format, oral presentations, workshops) on the making of an innovative medicine, the entire and complex process starting from the therapeutic target identification up until the clinical development and use in clinical practice of a new molecular entity (NME) will be addressed and discussed.

The course is divided in eleven sections of each 2 periods of 45 minutes and sections 12 & 13 of 4 periods of 45 minutes :

Section 1	Scope of the course, general organization, case study
Section 2	Historical perspective: the modern pharmacy
Section 3	Introduction to translational research: crossing the bridge
Section 4-5	Therapeutic target identification I & II
Section 6	Structure based drug design, medicinal chemistry, low/high throughput screening assays, multiple parallel parameters optimization MDO
Section 7	Therapeutic peptides and biologicals: today's - tomorrow's pharmacy NBEs
Section 8	Personalized Healthcare (PHC) precision medicine
Section 9	Pharmacogenetic polymorphisms, Pharmacogenomics
Section 10	In vivo pharmacology, investigative toxicology
Section 11	Clinical research, phase 0, phase I, II, III, IV // Intellectual property, integrity in research, my genome vs our genomes
Section 12	Health Hackathon - Hacking medicine I
Section 13	Health Hackathon - Hacking medicine II

Minimum 10 participants

Maximum 25 participants

Note

The next session is scheduled to be given starting Thursday September 11, 2025.

Keywords

Translational biomedical research/Drug discovery

Learning Prerequisites

Required courses

Basic knowledge in Molecular Biology, Chemistry, Cellular Signaling, Pharmacology

Resources

Bibliography

"A prescription for change : the looming crisis in drug development" Pr M. Kinch UNC Press(2017) ISBN 978-1-4696-3062-5

« Histoire de la médecine » Jean Starobinsky Editions BHMS ISBN 978-2-88955-041-8

« The emperor of all maladies" Siddhartha Mukherjee Scribner Ed. ISBN 978-1-4391-0795-9

"Drug-drug interactions" Albert Li Academic Press Ed. ISBN 0-12032944-1

Ressources en bibliothèque

- [Drug-drug interactions" Albert Li Academic Press Ed.](#)
- [A prescription for change : the looming crisis in drug development](#)
- [The emperor of all maladies, Siddhartha Mukherjee](#)
- [Histoire de la médecine, Jean Starobinsky](#)

Notes/Handbook

Moodle Link

- <https://go.epfl.ch/BIO-698>