
COURSE: Organic Chemistry of Bioactive Compounds

ACADEMIC YEAR: 2019-2020

TYPE OF EDUCATIONAL ACTIVITY: Free Choice

TEACHER: Prof. Maria Funicello

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Language: **Italian**

ECTS: (lessons e tutorials/practice) 6	n. of hours: (lessons e tutorials/practice) 48(Theoretical lessons)	Campus: Potenza Dept./School: Dipartimento di Scienze Program: Chemical Science	Semester: I (date)
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EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The main objective of the course is to provide students with the basics to face the knowledge and design of new molecules that are candidates to become drugs.

The main knowledge provided will be the following:

- Basic elements in the design of new drugs
- Fundamental characteristics of the categories of drugs and their assembly
- Basic knowledge to deal with chemical synthesis without neglecting the stereochemical aspects

The main skills that can be achieved are:

- Analyze potentially bioactive structures and structure-activity interaction
 - Evaluate the best synthetic approaches and potential analogues
 - Use the acquired knowledge to design scale-up
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PRE-REQUIREMENTS

It is necessary to have acquired and assimilated the main knowledge of instrumental and synthetic organic chemistry provided by the basic and characteristic courses of the disciplinary sector CHIM / 06, carried out during the first level degree.

SYLLABUS

1. Natural and synthetic drugs; research team for the discovery of new active molecules; biological assays; pre-clinical and clinical phases; patents, SAR studies; importance of relative and absolute configuration.
 2. How is possible the change of structure of a lead compound. Principal synthetic approaches. Combinatorial chemistry
 3. Main chemotherapeutic agents; cellular membranes; antiviral, antifungine and antibacterial drugs. HIV -1: life cycle of the virus and therapies.
 4. Antitumoral drugs and antioxidants. Peptidomimetics and pseudopeptides; Anti-Alzheimer and anti-Parkinson drugs; neurofibrillar aggregation; BACE-1 and HIV-PR: considerations.
 5. Prodrugs: characteristics and application. ADEPT, ADAPT, GDEPT, VDEPT. Activation
 6. "From bench to market": what is the PRDG, atom economy, environmental impact, catalysis, scale-up. Acyclovir: history and perspectives.
 7. Formulation chemistry
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TEACHING METHODS

Theoretical lessons, Technical visits.

EVALUATION METHODS

Oral examination and discussion of a project work on Prodrugs

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

1. Gareth Thomas, *Medicinal Chemistry, an introduction*, Wiley Interscience.
 2. Silverman, R.B. *The Organic Chemistry of Drug Design and Drug Action*; Elsevier Academic Press: Evanston, IL, USA, 2004.
 3. Cabri, W.; Di Fabio, R. *From bench to market*, Oxford University Press, New York, 2000.
 4. H.P. Rang, M.M. Dale, J. M. Ritter, P. K. Moore, *Farmacologia*, Casa Editrice Ambrosiana per l'edizione italiana.
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INTERACTION WITH STUDENTS

Contact by mail and receiving by appointment on every day

EXAMINATION SESSIONS (FORECAST)¹

20/2/2019; 20/3/2019; 14/5/2019; 19/6/2019; 16/7/2019;15/10/2019; 13/12/2019

SEMINARS BY EXTERNAL EXPERTS YES X NO

FURTHER INFORMATION

¹Subject to possible changes: check the web site of the Teacher or the Department/School for updates.