
COURSE: Chemistry of natural organic compounds

ACADEMIC YEAR: 2019-2020

TYPE OF EDUCATIONAL ACTIVITY: Affine

TEACHER: Lucia CHIUMMIENTO

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mobile (optional):

Language: **italian**

ECTS: **6** (lessons e
tutorials/practice)n. of hours: **48** (lessons e
tutorials/practice)Campus: **Potenza**
Dept./School: **Dipartimento di
Scienze**
Program:Semester: I
(date)
**From 01 october 2019
to 20 december
2019/20 january 2020**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

Student has to demonstrate understanding all the main characteristic of the different metabolic pathways present in the biosynthesis of natural compounds.

He has to be able to recognize the class of compounds and the pathway involved during the biosynthesis.

At the end of the course students should know the ecological role of secondary metabolites and their use as drugs.

PRE-REQUIREMENTS

Student has to know the basic concepts of organic chemistry: nucleophilic substitution reactions, elimination reaction, imine and enamine formation, aldolic and Claisen condensations oxidations and reductions Keto-enolic equilibria, electrophilic additions, sigmatropic rearrangements.i.

SYLLABUS

Primary and secondary metabolism: main coenzymes and metabolic intermediates. Building blocks.

Acetate pathway. Saturated and unsaturated fatty acids, polyacetates and polypropionates
Prostaglandins, leucotrienes and tromboxanes. Aromatic polyketides. Macrolides.

Shikimate pathway. Aromatic aminoacids. Cinnamyl acid and derivatives. Coumarins,
flavonoids, stilbenes.

Mevalonic acid and methyl-erythritol phosphate pathways. Terpenes (nomenclature)and steroids
(stereochemistry): cholesterol, steroidal saponines, cardioactive glycosides, pythosterols, vitamin D,
biliar acid, steroidal hormones.

Alkaloids. Alkaloids of hornitine, lysine, nicotine, tyrosine, triptophan, histidine..

Modified peptids: beta-lactam systems.

TEACHING METHODS

Theoretical lessons, Classroom tutorials. *Several tests on biosynthetical mechanism.*

EVALUATION METHODS

Oral examination can be performed by debating on published papers about natural compounds and student has to discuss about the belonging class of compounds and the hypothetical metabolic pathways involved during their biosynthesis..

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- P. M. Dewick: **Medicinal Natural Products, A Biosynthetic Approach**, (Wiley 2009)- "**Chimica, biosintesi e bioattività delle sostanze naturali**", Piccin, Padova, 2013
 - X.-T. Liang, W.-S. Fang: **Medicinal Chemistry of Bioactive Natural product**, Wiley 2006
 - J. Clayden, N. Greeves, S. Warren, P. Wothers: **Organic Chemistry**, Oxford press
 - Nicolaou, K. C.; Montagnon, T. "**Molecules that changed the world**", Wiley-VCH. 2007
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INTERACTION WITH STUDENTS

Teacher meets students for details about items of the course in own office each Monday: from 11:30 to 13:30.

EXAMINATION SESSIONS (FORECAST)¹

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

21/02/2020, 21/03/2020, 24/04/2020, 22/05/2020, 19/06/2020, 24/07/2020, 25/09/2020, 23/10/2020, 18/12/2020

SEMINARS BY EXTERNAL EXPERTS YES NO

FURTHER INFORMATION
