
COURSE: ADVANCED MOLECULAR BIOLOGY

ACADEMIC YEAR: 2018-2019

TYPE OF EDUCATIONAL ACTIVITY: characterizing

TEACHER: Prof. Angelo BRACALELLO

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website:

phone: 0971205949

mobile (optional):

Language: Italian

ECTS: 6 (4 lessons e 2
tutorials/practice)n. of hours:56 (32lessons e
24 tutorials/practice)Campus: **Potenza**
Dept./School:**Department of
Science**
Master's Degree in biotechnology
for medical, pharmaceutical and
veterinary diagnosticsSemester: II
Start and end of
course:
01/03/2019 al
31/05/2019-
20/06/2019)

EDUCATIONAL GOALS AND EXPECTED LEARNING: The course aims to provide students with knowledge on the structure and organization of the genomes of eukaryotes, prokaryotes and viruses. In the final part of the course will also be treated the main techniques used for their sequencing with particular regard to the eukaryotic genome. At the end of the course the students will have to understand how the genomes of living organisms and viruses are organized. They will also have to be able to design a sequencing analysis of prokaryotic and / or eukaryotic genomes.

PRE-REQUIREMENTS

Although no prerequisites are required, solid bases of Molecular Biology, Genetics and Biochemistry are recommended.

SYLLABUS

Genomes) : General characteristics.

Eukaryotic genomes(14h) : structure of chromatin and chromosomes , histone proteins , minichromosomes , B chromosomes , chromosomes olocentrici , structure of centromeres and telomeres , telomerase , distribution of genes along the chromosome , Isocore , correlation between the isocore and properties of the genome, C-value , paradox C value , the composition of the human genome , genes and gene sequences related, intergenic DNA , DNA content .

Prokaryotic genomes(4 h.) : structure and number of chromosomes , number and structure of genes , species concept , genomes of mitochondria and chloroplasts.

Viral genomes and mobile elements(10 h.) : composition and structure of viral genomes , retroviruses and pararetrovirus , lytic and lysogenic cycle, replicative strategies , gene rearrangement , RNA satellites , viroids , mobile genetic elements , LINE , SINE , LTR elements , non- LTR transposons. Sequencing of genomes .

Genome sequencing methods (4 h.): Sanger method. Pyrosequencing. Second and third generation sequencing methods

TEACHING METHODS

The course is structured in frontal theoretical lectures and guided exercises in the laboratory. In particular, 56 total hours of teaching (6 CFU) are provided, of which 32 of lessons and 24 of exercise / laboratory. The lessons are held weekly in the classroom and the exhibition takes place through the use of slides on power-points and videos that illustrate the various steps of the sequencing methodologies.

EVALUATION METHODS

The achievement of the training objectives will be verified through an oral exam that involves the formulation of at least three questions. The grade is attributed according to the maturity and skills demonstrated by the student in the presentation of the answers.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

T.A. Brown, Genomi 3, Ed Edises.

R.F. Weaver, Biologia Molecolare, Ed Mc Graw- Hill.

T. Strachan, *Read Andrew P.*, Genetica Molecolare Umana, Ed Zanichelli.

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INTERACTION WITH STUDENTS

Office hours: Tuesday and Thursday from 2.30pm to 4.30pm.

Outside these hours it is always possible to have an interview with the teacher by appointment.

EXAMINATION SESSIONS (FORECAST)¹

22 January 2019; 05 February 2019; 04 March 2019; 12 June 2019; 16 July 2019; 10 September 2019; 19 December 2019.

SEMINARS BY EXTERNAL EXPERTS YES NO

FURTHER INFORMATION

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