



Syllabus for the elective course:  
**Neuroimmunology**

**Academic year:** 2023/2024

**Program:** Graduate programs: Biotechnology in Medicine, Drug Research and Development, Medicinal Chemistry, and Biotechnology for the Life Sciences  
*Max – 20 students*

**Course code:** EBIL164

**ECTS points:** 3

**Language of the course:** English

**Teaching hours:** 30 hours (16 lectures + 14 seminars)

**Prerequisite for enrolment:** basic knowledge in immunology and neurobiology

**Course leader and contact information:**

Title and name: Professor Ivana Munitić

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**Time period:** June 24<sup>th</sup> 2024 – July 5<sup>th</sup> 2024

**Teachers:**

Professor Ivana Munitić

Mag. Josip Peradinović

**Literature**

1. Basic Immunology 6th Edition, Abul Abbas Andrew H. Lichtman Shiv Pillai, Elsevier 2019.
2. Online textbook: <https://philschatz.com/anatomy-book/> (Chapters 12-15; special focus on chapters 12, 13.2, 13.3 i 15.1)
3. Recently published original scientific papers (to be determined, TBD).



**Recommended additional literature:**

Selected scientific papers.

**Course objectives:**

The aim of the course "Neuroimmunology" is to enable students to understand the importance of the interaction between the immune and nervous systems in both health and disease. Cellular and molecular mechanisms of neurodegenerative and neuroinflammatory diseases will be discussed as well as potential immunotherapeutic approaches for targeting them.

**Learning outcomes:**

By the end of the course, students will be able to:

- Understand the importance of the immune surveillance of the CNS.
- Explain how the immune system cells enter the CNS.
- Define neuroinflammation.
- Understand the importance of neuroinflammatory processes in health and disease.
- Describe the relationship between the immune system and stress.
- Understand the molecular basis of sickness behavior.
- Understand the molecular and cellular basis of neurodegenerative diseases.
- Critically discuss the current therapeutic approaches in neurodegenerative diseases.
- Integrate previously acquired knowledge in immunology, molecular biology and neuroscience for the purpose of in proposing new immunotherapeutic approaches in neurodegenerative diseases.

*General competences gained on the course:*

A1, A2, A3, A5, A7, B1, B3, B4; C1, C2, C3, C4.

**Detailed course content:**

**Lectures:** As listed below.

**Seminars:** As listed below.

**Requirements, methods of assessment and evaluation:**

Students are required to attend all classes.

**Qualification and grades (according to Pravilnik o studijima Sveučilišta u Rijeci):**  
**Assessment during the course (50%); based on the average mark for all individual assignments (homework, journal clubs, seminars, science popularization assignments, tests, etc).**



**Final exam - 50 %.** The final exam will be written and/or oral, depending on the feasibility of holding live exams.

Eligibility for final exam:

- Students scoring between 0 and 24.9% will not be allowed to approach the final exam
- Students scoring between 25% and 50% will be allowed to approach the final exam

The final exam is taken in writing, and contains 20 questions that are scored individually. If no points are earned, the exam will be graded FX.

#### **Examination deadlines:**

1. The final exam will be on 5/7/2024 at 11 am in O-339.
2. The final exam, second round (for those who need to retake the test) will be determine later
3. Additional final exams (maximum two more) will be by arrangement between the students and teacher.

#### **Final grades**

The following grades will be awarded based on the final score:

Percentage score	ECTS grade	Numerical grade
90% do 100%	A	Excellent (5)
75% do 89,9%	B	Very good (4)
60% do 74,9%	C	Good (3)
50% do 59,9%	D	Satisfactory (2)
0% do 49,9%	F	Unsatisfactory (1)

The final grade is based on the sum of percentage points accumulated during the course and on the final exam. Passing grades are excellent (5), very good (4), good (3) and satisfactory (2).

To complete the course students must attain a passing mark for the entire course (50% or higher) as well as achieving at least 50% at the final exam.

#### **Additional information:**

##### **Academic integrity**

Students are required to respect the principles of academic integrity, and refer to the following documents: Ethical rules of the University of Rijeka and Ethical rules for students.



**Schedule of classes:**

Date	Class type	Topic	Hours	Group	Teacher	Time and place
24/6/2024	L1	Introduction to the immune system. Course overview.	3	all	Prof. Ivana Munitić	13-16 O-268
25/6/2024	L2	Introduction to the CNS.	3	all	Prof. Ivana Munitić	13-15.30 O-268
25/6/2024	S1	Science popularization brainstorming-part I	1	all	Prof. Ivana Munitić	15.45-16.30 O-268
26/6/2024	S2	Anatomy and function of the CNS (computer model 3D Brain and other)	3	all	Mag. Josip Peradinović	10-12.15 O-339
26/6/2024 2022	L3	Immune system in the CNS. Crosstalk between the immune system and the CNS.	3	all	Prof. Ivana Munitić	13.15-16 O-339
27/6/ 2024	L4	Molecular basis of neurodegenerative diseases: Alzheimer's disease (AD), amyotrophic lateral sclerosis (ALS) and Parkinson's disease (PD).	3	all	Prof. Ivana Munitić	13-16 O-268
1/7/2024	S2	Journal club –TBD	3	all	Mag. Josip Peradinović	13-16.00 O-339
2/7/ 2024	S3	Experimental neuroimmunology	2	all	Mag. Josip Peradinović	10-11.30 O-339
3/7/ 2024	L5	Molecular basis of spinal muscular atrophy (SMA).	1	all	Prof. Ivana Munitić	14-14.45 O-339
3/7/ 2024	L6	Molecular basis of multiple sclerosis (MS).	1	all	Prof. Ivana Munitić	15-15.45 O-339
3/7/ 2024	L7	Experimental models and therapies for CNS diseases	2	all	Prof. Ivana Munitić	16-17.30 O-339
4/7/ 2024	S5	Student presentations and chalk talks + Science popularization-part II	3	all	Assoc. Prof. Ivana Munitić	9-11.15 O-339
4/7/	S6	Repetitions for the final exam.	2	all	Assoc. Prof.	11.30-13



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2024		Student survey.			Ivana Munitić	O-339
5/7/ 2024		Final exam.	2		Assoc. Prof. Ivana Munitić	11-13 O-339