Summary

The students acquire knowledge regarding the fundamental aspects of the invertebrate and vertebrate immune response. Students apply this knowledge during team-based exercises and oral presentations.

Content

Each subject will be introduced by a lecture and followed by i) a presentation and discussion of a seminal publication by a student and in some cases ii) group exercises designed to test knowledge and promote conceptual thought. Topics will include:

- Historical advances in immunology
- Innate immune recognition
- Developmental immunology
- Immunological methods
- T cell subset differentiation and function
- Immunity to infectious agents (bacteria, fungi, parasites and viruses)
- Mucosal immunology
- Immune cell migration
- Allergy
- Autoimmunity
- Evolutionary immunology

Keywords

- immune cell subsets
- cellular migration
- cell-cell interactions
- infectious diseases
- inflammatory diseases
- cellular function
- pathogen recognition
- mucosa
- innate immunity
- adaptive immunity
Learning Prerequisites

Required courses
Biologie I, II, Biologie Moléculaire et Cellulaire I.

Recommended courses
Biologie Moléculaire et Cellulaire II & III.

Important concepts to start the course
- cellular biology
- pathogens

Learning Outcomes

By the end of the course, the student must be able to:

• Recall fundamental knowledge of the immune response
• Predict the necessary components of a protective immune response against a defined pathogen
• Propose novel therapeutic approaches to immune-mediated inflammatory diseases
• Model the dynamic movement of immune cells subsets within and between organs
• Characterize organ-specific immune responses
• Assess / Evaluate the scientific value of a hypothesis
• Critique a scientific article
• Assess / Evaluate the value and accuracy of a recent scientific report
• Use available resources to generate an oral report on an immunological topic

Transversal skills

• Identify the different roles that are involved in well-functioning teams and assume different roles, including leadership roles.
• Give feedback (critique) in an appropriate fashion.
• Make an oral presentation.
• Plan and carry out activities in a way which makes optimal use of available time and other resources.
• Use both general and domain specific IT resources and tools
• Access and evaluate appropriate sources of information.
• Summarize an article or a technical report.

Teaching methods

Lectures
Group exercises (problem solving, model building, project proposals)
Preparation and oral presentations of topics and of scientific articles

Expected student activities

revision of course content
presentation of scientific topic
summarization and presentation of a scientific article
group activities (problem solving) and group presentations
assessment of student presentations
participation in group discussions

Assessment methods
Observational assessment by the professor of participation in group activities and discussions
Observational assessment by the professor of leadership and team management skills.
Observational assessment by the professor of ability to utilize knowledge to form new hypotheses and to
develop appropriate work plans for the development of novel therapeutics
Observational assessment by the professor of the clarity and content of oral presentations outlining the students critique of a scientific article (10% of final grade)
Assessment by the professor of a written report on a topic covered in the LSS seminars given by Professor Reis de Sousa or Professor Wynn (10% of final grade)
Written assessment of acquired knowledge in an exam format (80% of final grade)