1. Temat zajęć: Allergy Beyond Allergens – How the Immune System Shapes Human Health

2. Data, miejsce i godziny zajęć

Termin: semestr letni, 28.04, 5.05, 12.05 19.05 2027 godz. 8.15-12.00,
Liczba spotkań: 4
Proponowane godziny: 4 × 5 godzin dydaktycznych
Sala: CKD, sala do ustalenia po wyborze seminarium

3. Forma zajęć

Stacjonarna

W uzasadnionych przypadkach organizacyjnych dopuszcza się możliwość realizacji zajęć w formie on-line.

4. Profil zajęć

Interdyscyplinarne seminaria łączące zagadnienia z zakresu:

- alergologii,
- immunologii,
- dermatologii,

Zajęcia mają charakter interdyscyplinarny i są skierowane do doktorantów reprezentujących różne dyscypliny nauk biomedycznych.

5. Dyscyplina

Nauki medyczne

6. Koordynator zajęć

dr n. med. Katarzyna Tomaszewska, adiunkt

7. Jednostka organizacyjna odpowiedzialna za przeprowadzenie zajęć

Zakład Psychodermatologii i Neuroimmunobiologii Skóry

8. Dane kontaktowe jednostki organizacyjnej

Adres: MOLecoLAB – Centrum Badań Molekularnych Chorób Cywilizacyjnych; Łódź, ul. Mazowiecka 5; Budynek A6 (pokój 0.20, 0.21)
Telefon: 508126620
E-mail: katarzyna.tomaszewska@umed.lodz.pl

9. Karta przedmiotu-dawniej Sylabus zajęć

Course title: Allergy Beyond Allergens: How the Immune System Shapes Human Health

Course aims:

The aim of the course is to provide doctoral students with an up-to-date, interdisciplinary understanding of allergic diseases as complex disorders resulting from

interactions between the immune system, epithelial barriers, genetic susceptibility, environmental exposures, the microbiome and neuroendocrine mechanisms.

The course is designed to move beyond the traditional concept of allergy as a simple reaction to specific allergens and to introduce contemporary concepts of allergic inflammation, type 2 immunity, molecular allergology, disease endotypes and targeted therapies.

Particular emphasis will be placed on the translation of basic immunological and molecular findings into clinical practice and on the identification of current research questions and future directions in allergology.

Types of educational activities and number of hours allocated:

The course is planned as 4 seminar sessions of 5 teaching hours each.

Number of ECTS credits allocated and their structure according to students' forms of learning:

1 ECTS

Prerequisites:

Students are expected to have:

- basic knowledge of human anatomy and physiology;
- basic knowledge of immunology;
- basic understanding of the mechanisms of inflammation;
- basic ability to read and interpret scientific literature in English.

Learning activities and teaching methods:

The course will employ a combination of the following teaching methods:

- interactive lectures;
- seminar-group discussions;
- multimedia-based learning;
- analysis and critical appraisal of scientific publications;
- student presentations.

Course unit content

1. Allergy in the Modern World: From Barrier Dysfunction to Immune Activation

- Current concepts and definitions in allergology;
- epidemiology and changing prevalence of allergic diseases;
- genetic susceptibility and environmental determinants;
- epithelial barrier function and barrier dysfunction;
- innate and adaptive immunity;
- type 2 immune responses;
- role of epithelial-derived cytokines and alarmins, including TSLP, IL-25 and IL-33;
- cellular and molecular mechanisms of allergic inflammation;
- transition from allergen exposure to clinical disease.

2. Allergy as a Systemic Disease: Skin, Gut, Airways and Environment

- The concept of systemic allergic disease;

- the skin–gut–lung axis;
- atopic dermatitis and the atopic march;
- food allergy;
- allergic rhinitis and asthma;
- the role of microbiota in immune development and immune tolerance;
- environmental pollution and climate-related factors;
- nutrition and lifestyle factors;
- interactions between the nervous, endocrine and immune systems;
- stress and neuroimmune mechanisms in allergic disease.

3. Precision Allergology: From Molecular Diagnosis to Targeted Treatment

- Modern diagnostic approaches in allergy;
- molecular allergology;
- component-resolved diagnostics;
- phenotypes and endotypes;
- biomarkers in allergic diseases;
- mechanisms of allergen-specific immunotherapy;
- induction of immune tolerance;
- biological therapies;
- targeted inhibition of key inflammatory pathways;
- personalized and precision medicine in allergology.

4. The Future of Allergy: Research Frontiers and Unanswered Questions

- emerging concepts in allergology and immunology;
- microbiome-based approaches;
- novel biomarkers;
- innovative immunomodulatory therapies;
- digital health and artificial intelligence in allergy;
- prevention of allergic diseases;
- personalized medicine;
- current controversies and unanswered questions;
- future directions in allergy research.

Course objectives

The course is designed to achieve educational outcomes in three main domains: factual knowledge, practical skills, and attitudes/transferrable generic competencies.

Knowledge: Upon completion of the course, the student:

1. understands the contemporary concepts and mechanisms of allergic diseases;
2. explains the role of innate and adaptive immunity in allergic inflammation;
3. understands the importance of epithelial barrier dysfunction in allergic disease;
4. describes the mechanisms of type 2 immune responses;
5. understands the role of cytokines, chemokines and immune-cell interactions in allergy;
6. explains the influence of environmental factors and microbiota on immune regulation;
7. understands the concept of the skin–gut–lung axis;

8. describes the principles of molecular and component-resolved allergy diagnostics;
9. understands the concepts of phenotypes, endotypes and biomarkers;
10. explains the mechanisms of allergen-specific immunotherapy;
11. understands the principles and indications of targeted and biological therapies;
12. is familiar with emerging concepts in precision allergology and translational immunology.

Skills: Upon completion of the course, the student is able to:

1. critically search for and evaluate scientific literature in allergology and immunology;
2. interpret selected clinical and molecular allergy data;
3. distinguish between conventional and molecular diagnostic approaches;
4. critically analyse evidence supporting diagnostic and therapeutic interventions;
5. interpret selected research findings concerning biomarkers, immune pathways and targeted therapies;
6. connect molecular mechanisms with clinical manifestations of allergic diseases;
7. identify relevant scientific questions and formulate preliminary research hypotheses;
8. present scientific information in a clear and structured manner;
9. participate effectively in scientific discussion and defend an evidence-based opinion;
10. integrate knowledge from different scientific disciplines in the analysis of allergic disease.

Attitudes and transferrable (generic) competencies: Upon completion of the course, the student:

1. demonstrates a critical and evidence-based approach to scientific information;
2. recognizes the importance of interdisciplinary collaboration in modern medicine and biomedical research;
3. communicates scientific concepts effectively to people from different professional backgrounds;
4. is able to work independently and as a member of a scientific team;
5. is able to contribute constructively to group discussion and collaborative problem-solving;
6. demonstrates responsibility for the quality and credibility of scientific information presented;
7. is able to identify priorities when evaluating complex scientific and clinical problems;
8. develops skills necessary for lifelong learning and continuous professional development;
9. recognizes the ethical importance of evidence-based practice and responsible interpretation of research findings;
10. demonstrates professional attitudes appropriate for doctoral-level scientific work.

Required learning resources (readings)

Students are expected to consult recent publications and review articles in the following areas:

- mechanisms of allergic inflammation;
- type 2 immunity;
- epithelial barrier dysfunction;
- molecular allergology;
- microbiome and immune regulation;
- allergen-specific immunotherapy;
- biological therapies;
- precision medicine and biomarkers.

Selected mandatory readings will be provided by the course coordinator before the relevant seminar sessions.

Recommended core journals include:

- *Journal of Allergy and Clinical Immunology*;
- *Allergy;*
- *Advances in Dermatology and Allergology*

Recommended learning resources (readings)

Alergologia. Podręcznik specjalistyczny pod redakcją Kariny Jahnz-Różyk, Macieja Kupczyka i Piotra Gajewskiego; ISBN: 9788374307277; Medycyna Praktyczna 2024

Assessment methods and criteria

Assessment method

Continuous assessment based on active participation in the seminar and completion of a short individual scientific presentation.

Students will be assessed on:

- participation in scientific discussions;
- ability to critically analyse scientific literature;
- quality and scientific accuracy of the final presentation.

Assessment criteria

The student passes the course if:

- the student actively participates in the seminar;
- the student prepares and presents the assigned scientific topic, which will be provided at least one week before the first seminar;
- the student's presentation demonstrates an appropriate use and interpretation of scientific evidence.

Rules for making up absences from classes

Attendance at all scheduled sessions is expected. In the event of an absence for justified reasons, the student is required to contact the course coordinator and complete an agreed make-up activity. The form of the make-up activity will be determined by the course coordinator.

10. Limit liczby uczestników

Minimalna liczba uczestników: 10 osób
Seminarium zostanie uruchomione, jeżeli zapisze się na nie minimum 10 doktorantów.

Maksymalna liczba uczestników: 20 osób.

Ograniczenie liczby uczestników umożliwi aktywną pracę seminaryjną, dyskusję nad publikacjami naukowymi oraz analizę przypadków klinicznych.

11. Czas trwania zajęć seminaryjnych

Łącznie: 20 godzin dydaktycznych

Zajęcia zostaną zrealizowane w formie 4 spotkań po 5 godzin dydaktycznych każde.

Zakładany całkowity wymiar seminarium wynosi 20 godzin, zgodnie z limitem określonym dla zajęć seminaryjnych.