

MOLECULAR IMMUNOLOGY

Module designation	<i>Molecular Immunology</i>
Semester(s) in which the module is taught	2
Person responsible for the module	<ol style="list-style-type: none"> 1. Prof. apt. Junaidi Khotib, S.Si., M.Kes.,Ph.D (Course Coordinator) 2. apt. Mahardian Rahmadi, S.Si., M.Sc., Ph.D 3. Chrismawan Ardianto, MSc., Ph.D.. Apt
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory / elective / specialisation</i>
Teaching methods	<i>lecture, discussion, assignment</i>
Workload (incl. contact hours, self-study hours)	<p><i>(Estimated) Total workload:</i> <i>Contact hours (structured activities.): 90,67 hours</i> <i>Private study including independent learning activites: 90,67 hours</i></p>
Credit points	<i>2 SCU / 6 ECTS</i>
Required and recommended prerequisites for joining the module	NA
Module objectives/intended learning outcomes	<p>Students are:</p> <p>LO1: Able to realize excellence based on religious morals (excellence with morality), able to work together, and show a responsible attitude to work in their field of expertise independently</p> <p>LO2: Able to internalize the spirit of independence, struggle, and entrepreneurship</p> <p>LO3: Able to develop and build logical-critical-systematic-creative thinking and scientific conceptions through scientific research, design creation, or artworks of science and technology that pays attention to and applies humanities values through an interdisciplinary or multidisciplinary approach in the form of a thesis or other equivalent forms</p> <p>LO4: Able to develop a pharmaceutical professional performance with analytical acumen in solving pharmaceutical problems and managing research in the pharmaceutical field related to national and global systems and policies, both inter and inter-disciplinary approaches</p> <p>LO5: Able to access and review information through an Information and Communication Technology (ICT) system, decide on a specific subject of study, maintain the feasibility of implementing research designs, conduct research, analyze data, conclude research results comprehensively, and create strategic issues based on the study that reflect the latest updates in the field of pharmaceutical sciences, and communicate them in the media and scientific forums at the national and international level through an interdisciplinary or multidisciplinary approach in the form of a thesis or other equivalent forms.</p> <p>LO6: Able to make decisions in the context of solving problems related to science and technology development based on analytical or experimental studies through collaboration with colleagues, colleagues in institutions and</p>

	<p>research communities at both national and international levels and utilizing research results for the benefit of the user and other communities</p> <p>LO7: Able to analyze natural materials to obtain active ingredients and/or pharmaceutical excipients with due observance of nature conservation.</p> <p>LO8: Able to carry out drug designs through the synthesis of bioactive compounds based on the structure-activity relationship.</p> <p>LO9: Able to carry out molecular manipulation of substances and develop formulations and manufacturing of pharmaceutical preparations with active pharmaceutical ingredients derived from natural products and synthetic compounds through the manufacture of polymorphs, nanoparticles, solid dispersions.</p> <p>LO11: Able to develop systems for evaluating the bioavailability of drugs in the body, pharmaceutical products circulation permits, and their in-vitro and in-vivo evaluations with specific delivery systems with appropriate analytical methods.</p> <p>LO13: Able to design drug development both from natural products and/or synthetic compounds by considering the biological mimicry system.</p> <p>LO14: Able to build drug management systems from active pharmaceutical ingredients to finished products that are ready for therapeutic uses</p>
Content	The Molecular Immunology course presents basic molecular concepts and mechanisms underlying the concept of the immune system, components involved in immune reactions, the concept of innate immunity as a form of host defense against infection, molecular antigens and lymphocytes, receptors in immunity and delivery of molecular signals, antigen control in adaptive immune system, T cell-mediated immunity and its molecular mechanisms, Humoral immune response, B lymphocyte activation and antibody production, molecular immunology in tumors and organ transplantation, molecular immunology in cases of hypersensitivity
Exams and assessment formats	<i>Final exam (100 minutes), take-home written assignments</i>
Study and examination requirements	<i>the final grade in the module is composed of 90% take-home assignments 10% in-class participation and soft-skills assessment. Students must have a final grade of 70% or higher to pass</i>
Reading list	<ol style="list-style-type: none"> 1. Coico R, Sunshine G, Immunology: A Short Course 7th Edition, Kindle Edition, Willey Blackwell, 2015 2. Abbas AK, Lichtman AH, Pillai S, Basic Immunology, Elsevier, 6th Edition, 2020 3. Abbas AK, Lichtman AH, Pillai S, Cellular and Molecular Immunology, Elsevier, 10th Edition, 2021