

MOLECULAR PHARMACOLOGY

Module designation	Molecular Pharmacology
Semester(s) in which the module is taught	2
Person responsible for the module	1. Prof. Junaidi Khotib, S.Si., Apt., M.Kes.,Ph.D (Course Coordinator) 2. Mahardian Rahmadi, S.Si., MSc., Ph.D., Apt. 3. Chrismawan Ardianto, S. Farm., Apt., M.Sc., Ph.D.
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)	<i>(Estimated) Total workload: Contact hours (structured activities.): 90,67 hours Private study including independent learning activities: 90,67 hours</i>
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 research communities at both national and international</p>

	<p>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>LO10: Able to develop pharmaceutical management systems and policies related to the referral health care system and the role and function of pharmacists as an integral part of the health care team in order to improve community welfare.</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	<p>Molecular Pharmacology course provide topics about the basic concepts of the molecular mechanism of drug action; prediction of effects of agonists, competitive antagonists and non-competitive antagonists; activation of signaling pathways by both endogenous and exogenous agonists (intra and intercellular signal delivery systems, MAPK signaling pathway, Toll-like signaling pathway, Notch signaling pathway, Insulin signaling pathway, Ras signaling pathway, Jak stat signaling pathway, Nfkb signaling pathway) ; molecular aspects in assessing the dose-effect relationship as well as drug safety estimation (molecular action of antimicrobials (mechanism of eradication, signaling, effectiveness and resistance, molecular action of PNS and CNS drugs (activation, inhibition and effects), molecular action of endocrine-disordering drugs , drugs for cancer); aspects of polymorphism on agonist effectiveness and its variations (polymorphism, genetic influence on metabolism, genetic influence on pharmacological effects of drugs); Effects of long-term drug use – resistance and tolerance.</p>
Exams and assessment formats	<p><i>Mid term exam and final exam</i></p>