

BIOTRANSFORMATION AND DRUG DESIGN

Module designation	<i>Biotransformation and Drug Design</i>
Semester(s) in which the module is taught	2
Person responsible for the module	1. Dr. Juni Ekowati, M.Si., Apt.. (Course Coordinator) 2. Prof. Dr. Achmad Syachrani, MS., Apt. 3. Dr. Nuzul Wahyuning D., M.Si., Apt.
Language	<i>Bahasa Indonesia</i>
Relation to curriculum	<i>Compulsory</i> / <i>elective</i> / <i>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

<p>Module objectives/intended learning outcomes</p>	<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 levels and utilizing research results for the benefit of the user and other communities.</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>LO13: Able to design drug development both from natural products and/or synthetic compounds by considering the biological mimicry system.</p>
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Content	The Biotransformation and Drug Development course describes advanced aspects of drug transformation in the body, including various biotransformation reactions, Phase I and Phase II, enzymes that play a role in biotransformation, effect of the biotransformation process on the physical, chemical, and pharmacological properties of drugs, factors affecting the biotransformation process, biotransformation of an aromatic compound, active metabolites as candidates for drug development, prodrugs in drug development, synthesis of drugs through biotransformation processes.
Exams and assessment formats	<i>Take-home written assignments</i>
Study and examination requirements	<i>the final grade in the module is composed of 30% discussion, 30% presentation, 30% 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. Michael A. Lieberman, Alisa Peet. 2015. <i>Marks' Essentials of Medical Biochemistry A Clinical Approach 2 nd ed.</i> Wolters Kluwer, Philadelphia 2. B.L. Goodwin. 2005. <i>Handbook of biotransformation of aromatic compounds.</i> CRC Press. Washington. 3. Kamal Shah, Durgesh N. Chauhan. Nagendra S. Chauhan. Pradeep Mishra. 2020. <i>Recent Advancement in prodrugs.</i> CRC Press. Washington. 4. Vivekkumar K. Reasani & Sanjay B.Bari. 2015. <i>Prodrug Design. Perspectives, Approaches, and application in Medicinal Chemistry.</i> Elsevier..Tokyo 6. Suzana S. et al.2008. <i>Biotransformation of Mefenamic Acid by Cell Suspension Cultures of Solanum Mamosum.</i> NPC 3(2) pp.113-302.