



Universitas Gadjah Mada

Faculty of Pharmacy

Doctoral Study Program in Pharmaceutical Science

Molecular Biology Technique (3,34 ECTS/ 2 CSU)

Code/Status	FAS3220108/Elective
Module designation	Doctoral Study Program in Pharmaceutical Science
Semester(s) in which the module is taught	1
Person responsible for the module	Dr. apt. Riris Istighfari Jenie, M.Si. Dr. apt. Rumiayati, M.Si. Dr. apt. Muthi' Ikawati, M.Sc. Dr. apt. Adam Hermawan, M.Sc.
Language	Indonesian
Teaching methods	Problem/case based learning. 100 minutes/weekly and 14 weeks during the semester
Workload (incl. contact hours, self-study hours)	100 minutes of in-class lectures
Credit points	3,34 ECTS/2 CSU
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	Students are proficiently trained in the concepts, principles, and cutting-edge technological applications of molecular biology techniques. Their expertise spans a broad spectrum, encompassing DNA and RNA-based methodologies, protein-based approaches, cell-centric techniques, and other advanced molecular biology practices. This comprehensive mastery ensures they are equipped with the knowledge and skills to navigate the rapidly evolving landscape of molecular biology with precision and depth.



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Content	This course focuses on the application of molecular biology techniques in the discovery and development of drugs and other pharmaceutical products. This course discusses the steps needed for each method related to the topic, starting from preparation, procedure, analysis, to important factors that need attention. Topics discussed in this course include cloning techniques; isolation, purification and analysis of nucleic acids and proteins (ie gel electrophoresis, polymerase chain reaction, immunochromatography); transfection in mammalian cell cultures; protein methods (ie immunoprecipitation, Western blot, protein staining); and cell-based assays. Advanced techniques such as flow cytometry, microarrays, and sequencing are also discussed in this course.
Examination forms	
Study and examination requirements	A-E. Project/case 50%. Presentation and discussion 50%.
Reading list	Main <ol style="list-style-type: none">1. Cseke, L.J., Kirakosyan, A., Kaufman, P.B., & Westfall, M.V. (Eds.). (2011). <i>Handbook of Molecular and Cellular Methods in Biology and Medicine</i> (3rd ed.). CRC Press. https://doi.org/10.1201/b11351 Additional: <ol style="list-style-type: none">1. Alberts, B., et al., 2015, <i>Molecular Biology of the Cell</i>, 6th Edition, Garland Publishing, USA2. Becker, W.M., Kleinsmith, L.J., and Hardin, J., 2000, <i>The World of The Cell</i>, 4th Edition, The Benjamin/Cummings Publishing Co., San Fransisco3. Cancer Chemoprevention Research Center Farmasi UGM, Protokol Uji Western blot, http://www.ccrcc.farmasi.ugm.ac.id/wp-content/uploads/protokol-western-blot-1-maret-2010.pdf, diakses Agustus 2018.4. Related research paper publication
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