

## Learning outcomes for the undergraduate study of molecular biology

1. Discuss the most significant discoveries and theories through the historical progress of biological scientific discoveries, and their impacts on the development of molecular biology.
2. Explain the fundamental principles of phylogeny and systematics of the living world, with the application of the principles of classification.
3. Link the structure of tissues, organs, organ systems and organisms with their functions in plants and animals.
4. Compare the structure of eukaryotic cells with the structure of simpler prokaryotic cells and with the structure of viruses.
5. Differentiate the main types of prokaryotes through their grouping abilities and list their characteristic and differentiating properties.
6. Associate the processes that unfold in individual cell compartments as preconditions for the functioning of the cell as a whole.
7. Analyse the main structural elements and processes that participate in reproduction, growth, maintenance and regulation of the cell, thereby enabling the survival of living beings.
8. Explain and identify the phases of division of somatic and sex cells.
9. Explain the fundamental structure, properties and processes in which nucleic acids play a part.
10. Discuss the molecular mechanisms by which DNA controls development, growth or morphological characteristics of organisms.
11. Explain the principles and laws of inheritance at the cell, individual and population levels.
12. Explain the emergence of mutations and their influence on the survival of individuals and species with the proposal of the method of targeted introduction of mutations due to the creation of new gene variations that can be used for further research or application in industry.
13. Explain the principles of cloning and genetic manipulation and their application in genetic analysis.
14. Apply the fundamental rules for occupational safety in the laboratory, with the proper use and maintenance of equipment.
15. Keep records on results obtained and observations made in a laboratory journal.
16. Independently use various devices, centrifuges, measuring instruments and optical aids in laboratory work.
17. Independently execute a laboratory experiment using the standard methods and techniques in molecular biology, with the appropriate analysis and interpretation of results obtained.
18. Process the results obtained in the conducted experiments using computer processing, and display the results in the form of a written report.
19. Accept the need and importance of ongoing development through the available lifelong learning programmes.