

## Subject card

|                                             |                                                                                                                                                                 |                                                          |                                         |                                     |                                                                          |            |     |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|--------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Biochemical basis of the genes' function, PG_00154453                                                                                                           |                                                          |                                         |                                     |                                                                          |            |     |
| Field of study                              | Biology                                                                                                                                                         |                                                          |                                         |                                     |                                                                          |            |     |
| Date of commencement of studies             | October 2024                                                                                                                                                    |                                                          | Academic year of realisation of subject |                                     | 2026/2027                                                                |            |     |
| Education level                             | undergraduate studies                                                                                                                                           |                                                          | Subject group                           |                                     | Obligatory subject group in the field of study<br>Optional subject group |            |     |
| Mode of study                               | full-time studies                                                                                                                                               |                                                          | Mode of delivery                        |                                     | at the university                                                        |            |     |
| Year of study                               | 3                                                                                                                                                               |                                                          | Language of instruction                 |                                     | Polish<br>Polish                                                         |            |     |
| Semester of study                           | 6                                                                                                                                                               |                                                          | ECTS credits                            |                                     | 1.0                                                                      |            |     |
| Learning profile                            | academic                                                                                                                                                        |                                                          | Assessment form                         |                                     |                                                                          |            |     |
| Conducting unit                             | Pracownia Biochemii Białek i Kwasów Nukleinowych -> Katedra Biochemii Ogólnej i Medycznej -> Faculty of Biology                                                 |                                                          |                                         |                                     |                                                                          |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                              |                                                          | dr hab. Dorota Żurawa-Janicka           |                                     |                                                                          |            |     |
|                                             | Teachers                                                                                                                                                        |                                                          |                                         |                                     |                                                                          |            |     |
| Lesson types                                | Lesson type                                                                                                                                                     | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                  | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                           | 15.0                                                     | 0.0                                     | 0.0                                 | 0.0                                                                      | 0.0        | 15  |
|                                             | E-learning hours included: 0.0                                                                                                                                  |                                                          |                                         |                                     |                                                                          |            |     |
| Learning activity and number of study hours | Learning activity                                                                                                                                               | Participation in didactic classes included in study plan |                                         | Participation in consultation hours |                                                                          | Self-study | SUM |
|                                             | Number of study hours                                                                                                                                           | 15                                                       |                                         | 2.0                                 |                                                                          | 8.0        | 25  |
| Subject objectives                          | Understanding the processes that proteins undergo after they are synthesized in the cell (modifications, transport, formation of the correct spatial structure) |                                                          |                                         |                                     |                                                                          |            |     |

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| Learning outcomes                                              | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Subject outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Method of verification                                                                                  |
|                                                                | [BIOLL3_K03] The graduate will be able to organise the work of a small team and work effectively as part of a team                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | - can organize the work of a small team and demonstrates the ability to work effectively in a team (B_K03) - effect of education implemented during auditorium classes                                                                                                                                                                                                                                                                                                                                                                             | [SK8] observation of student's independent or team work                                                 |
|                                                                | [BIOLL3_U05] The graduate will be able to synthesise data from a variety of sources and draw appropriate conclusions                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | - synthesizes data from various sources and draws conclusions based on them based on adequate conclusions (B_U05)                                                                                                                                                                                                                                                                                                                                                                                                                                  | [SU1] oral statement/conversation/discussion                                                            |
|                                                                | [BIOLL3_W14] The graduate knows the theoretical basis of experimental methods and the most important techniques of the biological sciences                                                                                                                                                                                                                                                                                                                                                                                                                                                  | - explains the theoretical basis of experimental methods and list the most important techniques used to study the structure and function of proteins and interactions between proteins (B_W14) - effect of education implemented during auditorium classes                                                                                                                                                                                                                                                                                         | [SW1] oral statement/conversation/discussion                                                            |
|                                                                | [BIOLL3_W02] The graduate knows the structure and properties of biological macromolecules, the molecular mechanisms of basal metabolic pathways and genetic information flow and the sources of variation in organisms; the rules of inheritance                                                                                                                                                                                                                                                                                                                                            | - describes the biochemical processes that are the basis for the functioning of organisms and indicates their relationship with other biological sciences (B_W02)                                                                                                                                                                                                                                                                                                                                                                                  | [SW4] test/exam - oral or written<br>[SW1] oral statement/conversation/discussion                       |
|                                                                | [BIOLL3_K06] The graduate is prepared to take responsibility for the equipment/materials entrusted to them and for their own work and that of others                                                                                                                                                                                                                                                                                                                                                                                                                                        | - is responsible for his work and respects the work of others (B_K06) - effect of education implemented during auditorium classes                                                                                                                                                                                                                                                                                                                                                                                                                  | [SK1] oral statement/conversation/discussion<br>[SK8] observation of student's independent or team work |
| Subject contents                                               | Posttranslational modification of proteins (proteolytic cleavage, phosphorylation, glycosylation, methylation, acetylation) and related changes in structure and functions (modulation of enzyme activity, influence on gene expression). Regulation of biochemical processes and their interconnections. Defects in metabolic pathways, their impact on the functioning of the body and human health (selected diseases related to congenital errors in metabolism). Biochemical basis of civilization diseases of the 21st century (diabetes, atherosclerosis, lipid disorders, obesity). |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                         |
| Prerequisites and co-requisites                                | Completion of courses: Biochemistry, Molecular biology with biotechnology or Organic chemistry and biochemistry, molecular biology and genetics. Knowledge of the structure and properties of basic types of biological macromolecules, molecular mechanisms of the flow of genetic information and the regulation of its expression.                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                         |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Percentage of the final grade                                                                           |
|                                                                | final test exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 100.0%                                                                                                  |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Lecture prepared on the basis of articles from scientific journals and:<br><br>Lieberman & Peet. Mark's Basic Biochemistry: A Clinical Approach. 6th Ed. Wolters Kluwer. 2022.<br><br>Janson & Tischler. The Big Picture: Medical Biochemistry. The McGraw-Hill Companies, Inc. 2012.<br><br>Rodwell et al. Harper's Illustrated Biochemistry. 30th Ed. McGraw-Hill Education. 2015.<br><br>Literature for self-learning: Ferrier. Biochemia (Lippincott Illustrated Reviews. 7th Ed.). wyd. pol. pod red. D. Chlubek. Edra Urban & Partner. 2017. |                                                                                                         |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Review articles form scientific journals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                         |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Adresy na platformie eNauczanie:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                         |
| Example issues/<br>example questions/<br>tasks being completed |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                         |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                         |