Attachment to the resolution no …../2017 of 2017.

# **DOCTORAL STUDIES OF MOLECULAR BIOLOGY**

Faculty of Biotechnology

Form of studies: Stationary

Limit of places: 20 places with doctoral fellowship

**Documents necessary for applying for admission to doctoral studies:**

1. A personal questionnaire printed out of the IRK system signed by the candidate;
2. An application for a PhD scholarship;
3. One photo in accordance with the dimensions used for the issuance of ID card (35 mm × 45 mm);
4. A photocopy of identity card or passport (in the case of foreign applicants)
5. A photocopy of a second-degree diploma
6. A certificate of student grades (uniform master studies or first- and second-degree studies);
7. A PhD thesis project;
8. A statement of the potential scientific supervisor and the Dean of the Faculty;
9. Document confirming the English language proficiency at B2 level,
10. Other documents relevant for eligibility criteria: work certificates, civil law agreement or certificates of work carried out as volunteer documenting the academic work experience, confirmation of the completion of foreign research internships, confirmation of activity in scientific circles, copies of the first page of scientific publications, etc.

**Scope of the qualification examination:**

* 1. Physicochemical properties of biomolecules.
  2. Biological function of proteins. Primary, secondary, tertiary, and quaternary structures of proteins.
  3. Enzymes, kinetics, enzymatic specificity, and regulation. Mechanisms of enzyme activity.
  4. Biosynthesis and protein degradation.
  5. Basic principles and techniques used in protein purification.
  6. Analytical and physicochemical methods used in macromolecule studies.
  7. Isolation and purification of DNA and RNA.
  8. Topological features of nucleic acid molecules, and structures of prokaryotic and eukaryotic genomes.
  9. Gene structure and control of its expression.
  10. Restriction enzymes and their application.
  11. Vectors, cloning, and subcloning.
  12. Definition of lipids, chemical structure of lipid compounds and their classification.
  13. Metabolism—general concepts. Glycolysis. Tricarboxylic acid cycle. Electron transport chain and oxidative phosphorylation. Photophosphorylation. Gluconeogenesis. Glycogen metabolism. Pentose-phosphate pathway. Amino acid metabolism. Integration of metabolic processes. The Chemiosmosis Theory.
  14. Biological, natural, and model membranes.
  15. The role of lipids and proteins in the structure and function of biological membranes, cell–cell interactions and signal transduction.
  16. Microorganisms in biotechnological processes: biology, selection, improvement, and growth parameters.
  17. Bioreactors: batch and continuous processes, surface reactors and fluidized, process monitoring, optimization of process conditions.
  18. Transgenic plants in the production of food and pharmacologically active substances.
  19. Transgenic animals as bioreactors: production of hormones, enzymes, and other proteins for therapeutic purposes.
  20. Basic physiology and cell pathology.
  21. Cell cultures and animal and plant tissue cultures.
  22. Basic human immunology.
  23. Basic techniques used in molecular biology.
  24. Applications of biotechnology in diagnostics and therapy.
  25. Basic population genetics.
  26. Basic bioinformatics and phylogenetic analyses.

**Recruitment rules**

University graduates with secondary diplomas may apply for admission (with a master's degree, master of engineering degree, title of doctor, or another equivalent) or beneficiaries of the “Diamond Grant” program. The candidate is obliged to submit the required documents by September 5, 2017 in the Dean's Office of the Faculty of Biotechnology, University of Wrocław. Only applicants who pass an English B2 level examination can apply for admission to the qualification examination. Candidates who have passed a B2 level qualification or candidates who have passed state examinations or other equivalent are exempted from the entrance exam in English. During the qualification exam, candidates answer questions related to their master's thesis, planned doctoral dissertation, and the thematic scope as listed above. The place on the ranking list decides the admission to the PhD study, created after summing up points earned by individual candidates in the qualification procedure. Foreign candidates, both admitted by the selection committee and by the Rector's decision, are obliged to pass the qualification examination. In addition, foreigners may be admitted to doctoral studies conducted in Polish, if:

1. they will complete an annual preparatory course to study in Polish language;
2. they have a certificate of knowledge of Polish language issued by the State Commission for Certification of Knowledge of Polish as a Foreign Language; or
3. they will be confirmed by the recruitment committee at the Faculty of Biotechnology that their preparation and the level of knowledge of Polish language allow them to take up studies in Polish.

In exceptional cases, an individual course of study may be set up for them, in which they must complete a preparatory Polish course.

**Detailed rules for awarding points during the qualification examination**

The exam is assessed by each examiner on a scale of 1–5. The arithmetic mean is calculated from the ratings given. Passing the test requires an average grade of 3.0 or higher. Students who have achieved an average grade of less than 3.0 are not subject to further qualification. For those who have successfully passed the qualification examination, the score obtained is multiplied by 4, and the qualification points obtained are combined with points for other achievements.

**Detailed rules for awarding credits for a PhD project**

During the interview, candidates presents their PhD thesis. The project and its presentation are evaluated by each member of the recruitment committee on a scale from 0 to 1 points. When rounded to decimal, points are added to the remaining recruiting points.

**Detailed rules for granting the remaining points are as follows:**

1. For average grade from uniform master studies or first- and second-degree studies above 4.0, the candidate gets extra 5 points, e.g., 0 points for an average grade of 4.0; 5 points for an average grade of 4.5;
2. For the scientific activity: publication, active participation in scientific conferences, etc.:

a. 2.5 points for co-authorship in a publication in an indexed journal (from the list: “ISI Master Journal List”);

b. 1.0 point for co-authorship in a publication in a non-indexed scientific journal;

c. 0.5 points for co-authorship in a communication at a scientific conference;

1. For a long-term internship abroad (more than 3 months)—0.5 points;
2. For each state examination certificate confirming the knowledge of a foreign language—0.5 points;
3. For other documented scientific activity—0.5 points.

All points will be added and ranking list will be created, in the case of same number of points the average grade from uniform master studies or first- and second-degree studies is taken into account.