

**Recruitment for the Poznań Doctoral School of the Institutes of the Polish Academy of Sciences
at the Institute of Bioorganic Chemistry, PAS in Poznań
Procedure no. 13/2026/ICHB/PSD**

INSTITUTION: Institute of Bioorganic Chemistry, PAS
CITY: Poznań
POSITION F/M: PhD student
POSITIONS AVAILABLE: 1
SCIENTIFIC DISCIPLINE: Biological sciences
PUBLICATION DATE: 24.07.2026
APPLICATION DEADLINE: 31.08.2026
IBCH PAS WEBSITE: <https://portal.ichb.pl/homepage/>
PDS IPAS WEBSITE: <https://psd-ipan.ichb.pl/index.php/en/home/>

KEY WORDS: bioinformatics, metagenomics, metabolomics, cancer, machine learning, artificial intelligence,
Research topic: Prediction of response to immunotherapy in melanoma using metabolic signatures of the gut mycobiome

Principal Investigator: Dr. Natalia Szóstak, DSc

I. Project description:

The main objective of the project is to develop novel, interpretable predictive models for response to immunotherapy in patients with advanced melanoma, based on the functional activity of gut fungi (mycobiota) and their metabolites. Current research indicates that the gut microbiome plays a significant role in modulating immune responses and the efficacy of cancer immunotherapies; however, most existing studies focus on bacteria and taxonomic descriptions, which offer limited predictive power and poor biological interpretability. This project focuses on the underexplored fungal component of the microbiome, which exhibits distinct metabolic capacities and the ability to interact with both the host immune system and bacterial communities. It is hypothesised that the functional and metabolic properties of the gut mycobiota, rather than its taxonomic composition alone, may represent a key determinant of response to immunotherapy.

The analyses will be conducted on a cohort of patients with advanced melanoma treated with immune checkpoint inhibitors (anti-PD-1 therapy), using metagenomic, metabolomic, and clinical data. Integration of these datasets will enable the identification of metabolic pathways and metabolites associated with treatment efficacy, as well as the development of machine learning models with high predictive performance and strong biological interpretability. The ultimate aim of the project is to move from descriptive microbiome analyses towards a functional and mechanistic understanding of the role of the gut mycobiota in modulating anti-tumour immune responses, and to identify potential non-invasive biomarkers of immunotherapy response, which may contribute to the development of precision oncology.

The PhD student will participate in the analysis and integration of omics data, development and validation of predictive models, interpretation of results using artificial intelligence methods, and preparation of scientific publications. The project offers an opportunity to gain experience in bioinformatics, large-scale data analysis, metabolomics, and immuno-oncology. All computational analyses will be conducted using the high-performance computing infrastructure of the Poznań Supercomputing and Networking Center (PCSS).

Additional information:

1. Research and doctoral theses shall be carried out within the project 2025/59/D/NZ2/00484 entitled “Prediction of response to immunotherapy in melanoma using metabolic signatures of the gut mycobiome”, funded by the National Science Center
2. PhD students shall receive a stipend in the gross amount of ca 5555 PLN gross (4930 PLN net) for the period of 36 months with the possibility of extending up to 48 months, and with the possibility of increasing the amount of the stipend after the mid-term evaluation (in accordance with the current decision of the Director - 5750 PLN gross).
3. PhD students shall be subject to social insurance, pursuant to article. 6 section 1 passage 7b of the act of October 13th, 1998 on the social insurance system (Journal of Laws of 2019, item 300, 303 and 730).

II. Requirements for the candidates:

1. MSc degree in biology, bioinformatics, computer science or a related field, or fulfilling the conditions stipulated in article 186, section 2 of the act of July 20th, 2018 Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended).
2. Experience in the bioinformatic analysis of biological data.
3. Proficiency in Python and/or R and/or Bash programming.
4. Basic knowledge of statistics and data analysis.
5. Experience in next-generation sequencing (NGS) data analysis, metabolomics data analysis, and/or the application of machine learning/AI methods, as well as experience with high-performance computing (HPC) environments, including the use of job scheduling systems (e.g. Slurm) – considered an advantage.
6. High motivation for scientific work, independence, responsibility for assigned tasks, and ability to work both independently and as part of a team.
7. Very good spoken and written English.
Previous scientific experience, in particular co-authorship of scientific publications, internships, or training courses – considered an advantage.

III. Duties in project:

1. Development and maintenance of omics data analysis pipelines (metagenomics, metabolomics, immunophenotyping) and integration of large-scale datasets.
2. Analysis of shotgun metagenomics data, including taxonomic and functional profiling.
3. Exploratory and statistical analyses of multivariate datasets.
4. Data analysis using machine learning methods, including Explainable AI approaches.
5. Preparation of presentations and reports summarizing research tasks.
6. Contribution to scientific publications and presentation of results at seminars as well as national and international scientific conferences.
7. Literature review and critical analysis of scientific publications relevant to the project topic.

IV. Required documents:

1. Application for admission to PDS IPAS along with the consent for processing personal data upon the recruitment procedure and a statement on having acknowledged the regulations of recruitment for PDS IPAS, using form downloaded from: [IBCH Application for admission](#)
Applications without the aforementioned consent will not be considered.
2. Certified copy of the diploma confirming graduation or a certificate confirming graduation (in the case of diplomas issued by foreign higher education schools - the diploma entitling to apply for conferment of a doctoral

degree in the state of origin). Additional information on foreign school diplomas are available at: <https://nawa.gov.pl/en/recognition/recognition-for-academic-purposes/applying-for-admission-to-doctoral-studies>. If a document that raises doubts is submitted, the application will not be considered because the time required for its verification would make it impossible to complete the competition within the set deadline. **We recommend a submission of the Individual Recognition Statement**, obtained from the SYRENA system or another government institution, such as the Regional Authentication Center, **which can significantly speed up the recruitment process**.

3. The candidate will be obliged to present the originals of the aforementioned documents before or on the day of commencement of the education at the doctoral school PDS IPAS.
4. Scientific CV encompassing track record of previous education and employment, information on involvement in scientific activities (participation in student research groups, attendance at scientific conferences, accomplished internships and training, awarded prizes and distinction) and list of publications.
5. Cover letter featuring a short description of research interests, achievements and justification for the intention to commence education at the doctoral school.
6. Certificates or other documents confirming the degree of proficiency in English, if the candidate is in possession of such materials.
7. Contact details of at least one, previous scientific supervisor or another researcher who is entitled to issue an opinion on the candidate.

V. Applications should be submitted via the eRecruiter portal at:

<https://system.erecruiter.pl/FormTemplates/RecruitmentForm.aspx?WebID=97e07ba3444d4154add45341788f2d7e>

VI. Submission deadline is 31.08.2026.

VII. Criteria for evaluation of candidates:

1. Candidate's research achievements, pursuant to the grades obtained in the course of studies, scientific publications, awarded scholarships and distinctions resulting from conducting scientific research or student activities or other achievements.
2. Candidate's scientific and professional experience, pursuant to participation in conferences, workshops, training sessions and internships, implementation of research and commercial projects, involvement in scientific trusts and societies, international and professional mobility, experience in other sectors, including industry.
3. Candidate's knowledge on the following discipline: biological sciences.
4. Knowledge of the subject matter described in the recruitment advertisement.

VIII. The recruitment procedure shall be concluded no later than 12.10.2026

The results of recruitment will be announced at the PDS IPAS website: <https://psd-ipan.ichb.pl/index.php/en/home/>

IX. The description of the recruitment process is stipulated in the Regulations of Recruitment for PDS IPAS, to be found on the PDS IPAS website. Following the recruitment procedure, the unadmitted candidates will be informed on the number of points obtained at both stages.

For additional information please contact the Principal Investigator:

dr hab. Natalia Szóstak (*name and surname of the PI*)

e-mail: nszostak@ibch.poznan.pl

Information clause:

Pursuant to the stipulations of the regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), further referred to as GDPR, we hereby inform that:

1. The Institute of Bioorganic Chemistry, Polish Academy of Sciences, seated in Noskowskiego St. 12/14, 61-704 Poznan; REGON 000849327, NIP 777-00-02-062 is the administrator of the collected personal data (further referred to as the Institute).
2. The Administrator appointed a Data Protection Officer, who can be contacted in writing, via traditional mail, by sending a letter to the following address: Z. Noskowskiego St. 12/14, 61-704 Poznan, or by sending an e-mail to: dpo@ibch.poznan.pl.
3. The personal data of the candidates is processed for the purposes of fulfilling the tasks of the administrator, associated with conducting the recruitment procedure for a vacant position.
4. The legal basis for processing personal data is the Act of 26 June 1974 – The Labor Code, Act of 30 April 2010 on the Polish Academy of Sciences or the consent of the person whose data shall be subjected to processing.
5. Your personal data shall be subjected to processing for period of 3 months upon the date of decision of the recruitment committee. Following this period, the data will be irretrievably and effectively destroyed.
6. The personal data of the candidates shall not be transferred to any third country.
7. The person whose data shall be subjected to processing has the right to:
 - request access to his/her personal data, and to amend it or delete it, pursuant to articles 15-17 of GDPR;
 - limit data processing, in the events stipulated in article 18 of GDPR;
 - data transferring, pursuant to article 20 of GDPR;
 - withdraw consent at any moment, without influencing compliance with the law of the processing that was executed prior to consent withdrawal;
 - You have the right to lodge a complaint with the President of the Office for Personal Data Protection.

Providing personal data in the scope stipulated in article 22 (1) of the Act of 26 June 1974 – The Labor Code is mandatory, whereas providing data in a broader scope is voluntary and requires consent for its processing.

Protection for whistleblowers

In the case of reporting violations using a dedicated system for whistleblowers, the reporting person's data will be processed in accordance with applicable provisions on the protection of personal data, including the above-mentioned Regulation (EU 2016/679 of 27 April 2016). We ensure confidentiality and protection of the identity of reporting persons, and that their data will not be disclosed without their consent, unless the law provides otherwise.

Detailed rules regarding the protection of personal data and procedures for reporting violations of the law can be found in our Regulations on internal reporting at the Institute of Bioorganic Chemistry, Polish Academy of Sciences, available at the link:

<https://portal.ichb.pl/wp-content/uploads/2024/10/INTERNALREPORTINGREGULATIONS.pdf>