

**Recruitment for the Poznan Doctoral School of the Institutes of the Polish Academy of Sciences
at the Institute of Bioorganic Chemistry, PAS in Poznan
Procedure no. 19/2022/ICHB/PSD**

INSTITUTION: Institute of Bioorganic Chemistry, PAS
CITY: Poznan
POSITION: PhD student
POSITIONS AVAILABLE: 1
SCIENTIFIC DISCIPLINE: Biological sciences
PUBLICATION DATE: June 6, 2022
APPLICATION DEADLINE: August 21, 2022
IBCH PAS WEBSITE: <https://portal.ibch.poznan.pl/homepage/>
PDS IPAS WEBSITE: <https://psd-ipan.ichb.pl/index.php/en/home/>

KEY WORDS: neurodegeneration, selective neuronal vulnerability, spinocerebellar ataxia, single nucleus sequencing, targeted profiling, transcriptomic atlas of degenerating neurons

Principal Investigator: Pawel M. Switonski

Research topic: Elucidating neurodegenerative processes using direct profiling of selectively vulnerable neurons

I. Project description

Defined pattern of neurodegeneration is a common theme in most neurodegenerative disorders. It is a result of selective neuronal vulnerability - a phenomenon in which dysfunction and death affect only specific subpopulations of cells. A major obstacle in mechanistically understanding selective vulnerability is that the sensitive types of neurons constitute only a small fraction of all cells in the brain, which renders separation from other cellular populations difficult. Consequently, a dominant portion of scientific data is generated using bulk tissue profiling that averages out the signal from affected neurons.

This project seeks to identify cell type-unique molecular pathomechanisms using advanced cell type-specific profiling methods. A spinocerebellar ataxia type 7 (SCA7) transgenic mice (SCA7-266Q line) that exhibit progressive degeneration of cerebral Purkinje cells (PCs) will be used as a model of selective degeneration. We will evaluate genetically labeled PC nuclei from SCA7-266Q and wild-type littermates for differential gene expression using whole transcriptome RNA-seq. Simultaneously, we will use single-nucleus RNA/ATAC-seq to assess the cellular distribution, differential gene expression and accessible chromatin regions in all cellular subpopulations identified in SCA7-266Q mouse cerebella. Comparative functional analysis performed on the expression and epigenetic data from PC and control non-PC nuclei will deliver candidates for cellular networks predominantly altered in PCs. Finally, we will use a hypothesis-driven approach to determine if the alteration in the PARP1-NAD⁺-SIRT1-PGC-1 α regulatory axis, recently discovered by us in SCA7 using bulk cerebellar tissue, can also explain degeneration of SCA7 PCs.

Cell-specific mechanisms of neurodegeneration are a largely unexplored area of research. The results of this project will significantly advance our understanding of selective neuronal vulnerability, for which there is currently no satisfactory explanation.

Additional information:

1. Research and doctoral theses shall be carried out within the 2021/43/D/NZ3/03006 project entitled “Elucidating neurodegenerative processes using direct profiling of selectively vulnerable neurons”, funded by National Science Center
2. PhD students shall receive a stipend in the gross amount of approx. 4300 PLN (approx.3800 PLN net), for the period of 36 months with possible extension
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. The professional title of master's degree in the field of biology or related, or meeting the conditions specified in art. 186 paragraph 2 of the Act of July 20, 2018, Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended).
2. Experience working in a lab environment
3. Ability to perform basic cell/molecular biology assays, i.e. western blot, immunostaining, qPCR)
4. Understanding of high throughput sequencing, principles of flow cytometry and elementary statistics
5. Collaborative approach
6. Curiosity and creative thinking
7. A certain level of English proficiency is a requirement for this position. Good reading and writing skills are essential. Extra points for spoken English
8. Bonus points if you have experience with R or Python programming

III. Duties in project:

1. Participating in FANS, RNA-seq and other experiments
2. Scheduling and coordinating sample submissions to the core facilities
3. Assisting a cell sorter operator
4. Developing solutions or alternative approaches for experiments.
5. Analyzing data
6. Participating in preparation of manuscripts for publications

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 http://www.psd-ipan.ibch.poznan.pl/wp-content/uploads/2021/10/ICHBApplication_for_admission_202110.docx
2. Certified copy of the diploma confirming graduation or a certificate confirming graduation (in the case of diplomas issued by foreign higher education schools, diploma stipulated in article 326, section 2, passage 2 or article 327, passage 2 of the act of July 20th, 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended), entitling to apply for conferment of a doctoral degree in the state in where such a certificate was issued by the relevant higher education school. In the event when the candidate is not in

possession of the aforementioned documents, he/she is obliged to submit them prior to admission to PDS IPAS. 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>

3. 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.
4. Cover letter featuring a short description of research interests, achievements and justification for the intention to commence education at the doctoral school.
5. Certificates or other documents confirming the degree of proficiency in English, if the candidate is in possession of such materials.
6. 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=1dc4d8fe0b204229905edb71265da78c>

VI. Submission deadline is **August 21, 2022**

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 **September 16, 2022**

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

Incomplete applications will not be considered.

For additional information please contact the Principal Investigator:

Pawel M. Switonski

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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:

- *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).*
- *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.*
- *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.*
- *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.*
- *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.*
- *The personal data of the candidates shall not be transferred to any third country.*
- *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;*
 - *file a complaint to the Inspector General 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.