INSTITUTE
OF HUMAN GENETICS
POLISH ACADEMY OF SCIENCES

[3/2023/IGC/PSD] Announcement concerning recruitment to the Poznań Doctoral School of the Institutes of the Polish Academy of Sciences (PDS IPAS) as part of a research project

The Director of the Institute of Human Genetics, Polish Academy of Sciences (IHG PAS),
and leader of the current research project, **Zuzanna Bukowy-Bieryllo, PhD**
gives notice of an open competition to be held for the position of
PhD student-scholarship holder at the Poznan Doctoral School of Institutes PAS,
Department of Cancer Genetics IHG PAS
Number of vacancies: **1**

I. General information

1. Department in which candidate would work: **Department of Molecular and Clinical Genetics**
2. Discipline: **Medical Science**
3. Planned remuneration: scholarship to the value of about 4300 **PLN gross (3800 PLN net /per month)**
4. Period of involvement in research project: **32 months (extension possible)**
5. Deadline for submission of documents: **13.03.2023 r.**
6. Date of announcement: **27.01.2023 r.**

The proposed study will be carried out within the **OPUS-23** 2022/45/B/NZ4/00927

Project title: "Intriguing OFD1 (oral-facial-digital syndrome 1) protein, its interaction networks and biogenesis of primary and motile cilia".

Research Description:

Ciliopathies are a large group of genetic diseases caused by defects in the function of cilia - small organelles present on the surface of eukaryotic cells. Cilia consist of basal bodies anchored in the cell membrane, from which the main part of the cilium, the axoneme, grows. There are two main types of cilia, primary and motile, which differ in their main functions (sensing versus motility) and in number (primary cilia - one; motile cilia - hundreds per cell). Defects in the body's primary cilia can cause a wide variety of syndromic symptoms (ciliopathies), while dysfunction of the motile cilia causes only one type of ciliopathy, primary ciliary dyskinesia (PCD).

OFD1 (Xp22.2), one of the ciliary basal body proteins, is essential for the biogenesis of primary and motile cilia. Our studies have shown that truncating mutations located at the C-terminus of the OFD1 protein (exons 21 or 22) cause only defects in the motile cilia (the classic PCD phenotype), without the severe neurological symptoms typical of other ciliopathies associated with this protein. Further studies have led to the hypothesis that the C-terminus of the OFD1 protein is important for cilia biogenesis.

The goal of the project is to elucidate the molecular interactions of the OFD1 protein in cells containing different truncating variants of the protein that affect only motile cilia, or both motile and primary cilia. We want to study how OFD1 truncation affects protein interactions, cilia biogenesis stages and other OFD1-related cellular processes.

The project will utilize 2 cell lines with endogenously labeled OFD1, capable of forming primary or motile cilia. Protein truncating variants, previously identified in patients will be introduced Into these lines using the CRISPR-Cas9 technique. The prepared lines will be tested by co-immunoprecipitation and advanced mass spectrometry. In addition, we will also use immunofluorescence (IF) staining, transmission and scanning electron microscopy (TEM, SEM), quantitative RT-PCR (qRT-PCR), cytometry and RNAseq to accurately characterize cilia biogenesis and other cellular processes related to OFD1. Some of the specific interactors will then be silenced in *Danio rerio* to analyze their effects on motile cilia and embryonic development.

In summary, the project aims to decipher the effect of OFD1 protein truncation on the biogenesis of motile and primary cilia and to better understand the OFD1 interaction network. It may also help to explain the variability of symptoms in patients with various OFD1-related ciliopathies. The project will be carried out in collaboration with research groups from Germany and Portugal.

Keywords:
primary cilia, motile cilia, ciliary basal body, ciliopathies, respiratory epithelial differentiation, ciliogenesis.

Predicted tasks in the project:

- Active participation in the implementation of the experimental tasks of the grant and analysis of the results (design and creation of CRISPR-Cas9 modified lines, preparation of cell culture samples for protein, RNA and possible FLIM-FRET analyses, participation in cell cultures).
- Presentation of results at seminars, national and international conferences and participation in writing scientific publications
- Supervision of students

Opportunities:

- work in a young international research team, highly experienced in many molecular and cellular methodologies, and enthusiastic about conducting scientific research,
- participation in research training, international conferences and workshops.

II. Requirements for candidates

1. Master's degree in biology, biotechnology, biochemistry, molecular biology or related fields, or final year graduate student who will defend the thesis before the start of the fellowship
2. Experience in laboratory work (e.g. PCR, qRT-PCR), ability to work with proteins (e.g. Western blot, mass spectrometry etc) is welcome
3. Experience in cell culture, molecular biology and/or microscopy techniques would be an asset
4. Good written and oral communication skills in English
5. High grade point average in studies
6. Predisposition for scientific work, perseverance and accuracy in manual work, self-reliance, good work organization
7. Willingness to learn and take on new challenges, analytical thinking
8. Ability to work in a group

III. Required documents

1. CV, including research achievements.
2. Cover letter.

3. A copy of the diploma confirming completion of a Master's Studies Programme, or a certificate of their completion (in the case of diplomas issued by foreign institutions , the diploma referred to in article 326 para.2 point 2 or article 327 para. 2 of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668 as amended), giving the right to apply for a doctoral degree in the country in which the University of Higher Education issuing the diploma operates. If the candidate does not have the above-mentioned documents, s/he is obliged to provide them before being admitted to Poznań Doctoral School IPAS. More information about foreign diplomas is available at: **https://nawa.gov.pl/en/recognition/recognition-for-academic-purposes/applying-for-admission-to-doctoral-studies**.
4. Contact details of at least one current supervisor or other researcher who has previously agreed to issue an opinion about the candidate. The opinion should not be included in the application.
5. Consent for the processing of candidate's personal data for the purposes of the recruitment process: http://bip.igcz.poznan.pl/wp-content/uploads/2018/10/Zgoda-rekrutacja-Consent_for_the_processing.pdf
6. Application for admission to the Poznań Doctoral School IPAS, together with a consent to the processing of personal data for the purposes of the recruitment procedure plus a statement on his/her familiarity with recruitment regulations for the Poznań Doctoral School (Application is available on: **http://igcz.poznan.pl/en/phd-studies/poznan-doctoral-school-of-institutes-of-pas/recruitment-regulations-for-psd-ipan/**)
7. Certificates or other documents indicating level of English language proficiency, if the candidate possesses any.

IV. Criteria for the evaluation of candidates

1. Candidate's scientific and professional experience based on his/her participation in conferences, workshops, training courses and internships; participation in research and commercial projects; involvement in scientific societies and associations; international and professional mobility; experience in other sectors, including industry
2. Background in molecular biology
3. Candidate's scientific achievements, based on study grades, scientific and popular science publications, scholarships; prizes and awards resulting from research carried out; student activity or other achievements
4. Communication skills in English.

V. Announcement of results

Up to 30 days after the deadline of documents submission.

VI. Additional conditions

1. A condition of involvement in the project is participation in the Institutes of PAS (after passing the recruitment procedure). Details of the studies are available on https://igcz.poznan.pl/en/phd-studies/poznan-doctoral-school-of-institutes-of-pas/ . Fulfillment of requirements as set out in the Regulations for Granting Scholarships in Research Grants Financed by the National Research Center are available on (https://www.ncn.gov.pl/sites/default/files/pliki/uchwalyrady/2019/uchwala25_2019-zal1_ang.pdf).

VII. Additional information

Address to which documents should be submitted:

by e-mail to the Secretary for Scientific Purposes: **phdstudies@igcz.poznan.pl**. Please, include the number of the announcement: [**3/2023/IGC/PSD**] in the title of your e-mail.

Additional information is available from:
Dr. Zuzanna Bukowy-Bieryllo: zuzanna.bukowy-bieryllo@igcz.poznan.pl
and the Secretary for Scientific purposes: phdstudies@igcz.poznan.pl,

Applications sent after the deadline will not be considered.

Once the recruitment process is finished, unsuccessful candidates will be informed about the scores they have obtained at each step of evaluation.

Refusal of admission to PDS IPAS takes place by way of an administrative decision. The candidate is entitled to submit a request for reconsideration of the decision to the director of the institute concerned.

Project Leader

Z Bukowy-Bieryllo

Director of the Institute

DYREKTOR
Instytutu Genetyki Człowieka PAN

Prof. dr hab. med. Michał Witt