



## **“OPEN PHD POSITION”**

### **[11/2024/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 Deputy Director for Development on behalf of the Director of the Institute of Human Genetics,  
Polish Academy of Sciences (IHG PAS),

and leader of the current research project, **Agnieszka Zimna, 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 Molecular Pathology IHG PAS**

Number of vacancies: **1**

#### **I. General information**

1. Department in which candidate will work: **Department of Molecular Pathology**
2. Discipline: **Medical Science**
3. Planned remuneration: scholarship to the value of **4300 PLN gross/per month (3800 PLN net /per month)** before the mid-term evaluation
4. Period of involvement in research project: **36 months**
5. Deadline for submission of documents: **21.07.2024**
6. Date of announcement: **20.06.2024**

The proposed study will be carried out within the **SONATA 2023/51/D/NZ7/02579**

**PI – Agnieszka Zimna, PhD**

Project title: ***“CAR(dio)-T(oxicity)- Engineered Heart Tissue model for CAR-T cardiotoxicity evaluation”***

#### **7. Description of research:**

Chimeric antigen receptor-T (CAR-T) has been considered as a groundbreaking immunotherapy for certain types of cancers, that involves application of modified T-cells. Despite CAR-T has shown tremendous promise for the patients, one of the potential side effects associated with CAR-T therapy is cytokine release syndrome (CRS). CRS is an immune system reaction that occurs when the activated CAR-T cells and bystander cells release a large amount of cytokines into the bloodstream. Some patients exhibit serious systemic adverse effects due to CRS, including cardiovascular complications such as cardiomyopathy, heart failure (HF), arrhythmias etc. Knowing that the CAR-T therapy has a major cardiotoxicity effect, we aim to create advanced cardiological in vitro models, that can predict the immunological, morphological, physiological and molecular consequences of CAR-T therapy, and help solve the problem of toxicity.

During the course of the Project we want to address following questions regarding the cardiotoxicity of CAR-T therapy:

1. What is the cardiomyocyte cell morphology/physiology after the CAR-T therapy? Does this have any influence on contractile apparatus, intracellular ion management and beating patterns?
2. What is the influence of CAR-T therapy on cardiac tissue electrophysiology?
3. What is the common mechanism of toxicity? Does the CRS plays a pivotal role? How common is the phenomenon of off-tumor CAR-T mechanism and what is his influence on cardiomyocytes?
4. What are the molecular changes in heart after the CAR-T treatment? Are we able to connect the molecular changes with a treatment for patients to prevent the fatal effects?

We will answer all this questions by dissecting an elegant model for immunological studies on cardiomyocytes. For this purpose we will use cardiomyocytes derived from human induced pluripotent stem cells (iPSc). Their potential for differentiation into iCMs, provide a reasonable background for the development of human cardiac models. Sadly, cardiomyocytes differentiated from iPSc and cultured in a monolayer are not maturate enough to be a reliable source of physiological studies, however there are several aspects that can be discovered by using 2D culture, like: morphology (hypertrophy), organization of contractile apparatus, calcium transient, sodium or potassium current, contraction propagation. To get a better insight in the physiology of cardiomyocytes we will prepare Engineered Heart Tissue system (EHT- considered as most advanced models for translational cardiac studies) to gain mechanistic insights into the relationship between cardiomyocyte toxicity, inflammation, and contractile dysfunction after CAR-T therapy.

As a final result we expect to prepare advanced platform for evaluation of CAR-T therapy cardiotoxicity for further prediction and prevention of cardiac complications. This will have a great multidimensional socio-economic impact on patients well-being, increasement of CAR-T therapy efficiency and science development in the field.

**Keywords:**

hiPSC, cardiomyocytes, CAR-T, immunotherapy, engineered heart tissue, disease modelling

**Predicted tasks in the project:**

- active participation in the realization of project goals and analysis of obtained results
- presenting at seminars and conferences, participation in writing scientific papers
- supervision of students

**Opportunities:**

- getting familiar with a rich palette of molecular and cellular experimental techniques
- working with a team engaged and enthusiastic about science
- participation in national and international trainings, conferences and workshops
- chance for a brilliant scientific career

## II. Requirements for candidates

1. master's degree in molecular biology, biotechnology, genetics or a related field
2. basic experience in *in vitro* cell culture and handling (hiPS, iCMs, fibroblasts, PBMC)
3. experience in molecular biology techniques: PCR, RT-qPCR, preferably also Western blot and flow cytometry
4. experience in handling DNA and RNA, extraction of nucleic acids
5. very good written and oral communication in English
8. motivation and enthusiasm about working in science
9. good collaborative and team work skills

## 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](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/uchwaly-rady/2019/uchwala25\\_2019-zal1\\_ang.pdf](https://www.ncn.gov.pl/sites/default/files/pliki/uchwaly-rady/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](mailto:phdstudies@igcz.poznan.pl). Please, include the number of the announcement: 11/2024/IGC/PSD in the title of your e-mail.

#### Additional information is available from:

- Agnieszka Zimna: [agnieszka.zimna@igcz.poznan.pl](mailto:agnieszka.zimna@igcz.poznan.pl),
- Secretary for Scientific purposes: [phdstudies@igcz.poznan.pl](mailto:phdstudies@igcz.poznan.pl)

**Application 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



Director of the Institute

  
Z-GA DYREKTORA  
ds. Rozwoju  
Instytutu Genetyki Człowieka PAN  
dr hab. Natalia Rozwadowska, Prof. IGC PAN