INSTITUTE OF BIOORGANIC CHEMISTRY
Polish Academy of Sciences

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# 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.20/ICHB/PSD

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| INSTITUTION: | Institute of Bioorganic Chemistry, PAS |
| CITY: | Poznań |
| POSITION F/M: | PhD student |
| POSITIONS AVAILABLE: | 1 |
| SCIENTIFIC DISCIPLINE: | biological/chemical sciences |
| PUBLICATION DATE: | 30.10.2026 |
| APPLICATION DEADLINE: | 30.11.2026 |
| IBCH PAS WEBSITE: | https://portal.ichb.pl/homepage/ |
| PDS IPAS WEBSITE: | https://psd-ipan.ichb.pl/index.php/en/home/ |

**KEY WORDS:** G-quadruplex, DNA aptamer, hairpin, thrombin
Research topic: Modified nucleotide residues as potential tool to increase aptamer - target protein interaction
Principal Investigator: dr Weronika Kotkowiak

## I. Project description:

Aptamers are short, single strands of DNA or RNA that act like custom-made molecular keys. Their specific sequence tells them exactly how to fold into complex 3D shapes – some look like hairpins (such as Toggle-25t), while others form G-quadruplexes (like RE31 or RV66). It is this unique shape that allows them to bind to a target protein and switch its activity on or off.

While aptamers are incredibly versatile, they face a natural limitation. They are built from only four basic building blocks (nucleotides), whereas the proteins they target are made of 20 different amino acids. This lack of chemical variety means that aptamers sometimes struggle to bind their targets tightly enough. To overcome this, scientists have begun altering these building blocks. A major leap forward involved adding modifications that mimic amino acids (like SOMA-DNA), which significantly boosted how strongly aptamers could bind to proteins through hydrophobic interactions.

Inspired by these advancements, we have developed novel chemical compounds called SUNAs (Slow Off-Rate Unlocked Nucleic Acids). These modifications make the aptamer backbone more flexible, allowing it to bind to protein more effectively and stay attached for much longer. We are also exploring other ways to strengthen these connections, such as: replacement of oxygen with sulfur in the aptamer bonds or using modified sugar moieties (like 2'-fluoroarabinose) to stabilize the structure.

In this project, we propose to expand knowledge regarding the usefulness of these modifications for developing variants of RE31, RV66, and Toggle-25t aptamers with enhanced affinity for target proteins. A detailed understanding of these processes and mechanisms at the molecular level could enable the design of new versions of known inhibitors, which, in turn, could contribute to the improvement of therapeutic methods

**Additional information:**

1. Research and doctoral theses shall be carried out within the project 2024/55/D/NZ7/02686, entitled "Modified nucleotide residues as potential tool to increase aptamer - target protein interaction", funded by *National Science Center*
2. PhD students shall receive a stipend in the gross amount of ca 4 900 PLN (4 300 PLN net) for the period of 22 months with possible extention up to 48 months. After the positive mid-term evaluation there is an increase of the amount of the stipend to at least 5 750 PLN gross (according to current rates).

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).
4. Possibility of using the Multisport card, group insurance, social benefits (co-financing of holiday leave, refund of tickets for cultural events).

**II. Requirements for the candidates:**

1. MSc degree in chemistry/biology 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 laboratory work in the field biology and biochemistry
3. Experience in the field of oligonucleotides and experience in spectroscopic techniques is welcome.
4. Ability to independently solve research problems, search the literature related to the project topic, communicate effectively, organize work efficiently, demonstrate enthusiasm for experimental work, and work well both in a team and under time pressure.
5. Good knowledge of the fundamental concepts in molecular biology and/ or biochemistry.
6. Very good spoken and written English
7. Documented involvement in scientific activities and reference letters from previous research supervisors are welcome.

**III. Duties in project:**

1. Planning and conducting experiments, as well as analyzing, interpreting, and documenting results related to the determination of physicochemical and biological properties of modified aptamers with potential anticoagulant activity. The project involves the use of the following techniques: UV/VIS spectroscopy, circular dichroism spectroscopy, coagulometry, vertical polyacrylamide gel electrophoresis, and surface plasmon resonance spectroscopy.
2. Preparing presentations and reports on the progress of research tasks.
3. Participating in the writing of scientific publications and presenting results at seminars as well as at national and international scientific conferences.
4. Reviewing and analyzing scientific articles related 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=a713cc8bfc024803abf938bf937f43a7

**VI.** Submission deadline is 30.11.2026

**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/chemical sciences.
4. Knowledge of the subject matter described in the recruitment advertisement.

**VIII.** The recruitment procedure shall be concluded no later than 14.01.2027. 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 Weronika Kotkowiak

e-mail: kawecka@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;*
   - *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.*

***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:*