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. 25/2025/ICHB/PSD

INSTITUTION:	Institute of Bioorganic Chemistry, PAS
CITY:	Poznań
POSITION:	PhD student
POSITIONS AVAILABLE:	1
SCIENTIFIC DISCIPLINE:	biological sciences
PUBLICATION DATE:	01.12.2025
APPLICATION DEADLINE:	31.01.2026
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 a diverse group of single-stranded oligonucleotides whose sequence determines folding into a specific structure, which is a key factor enabling binding to a target protein and thus modulating its activity. Examples of the structural diversity of aptamers include the oligonucleotides RE31, RV66, and Toggle-25t, which adopt, respectively, a G-quadruplex structure with an additional duplex fragment, a parallel G-quadruplex with 5’ and 3’ flanking regions, and a hairpin-type structure with an internal loop. Although aptamers have found numerous applications, the low diversity of modified nucleotide residues compared to amino acids is a major limitation in enhancing their affinity and binding strength to target proteins. The development of nucleotide residue modifications (SOMA-DNA) that better mimic amino acid residues and can significantly improve aptamer binding strength due to additional hydrophobic interactions represented a major advancement in this field. These observations provided both the scientific foundation and the impetus for the creation of our novel modifications, termed specifically functionalized nucleic acids with increased ribose ring lability (Slow Off-Rate Unlocked Nucleic Acids, SUNAs). Other modifications that may improve protein–aptamer interactions include the introduction of a sulfur atom into the inter-nucleotide bond or at the C4 position of uridine, as well as replacing the ribose ring with a 2’-fluoroarabinose residue.

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 *number* 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 ca4300 PLN for the period of 24 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 regulation of the Minister - 5340.90 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).
4. Possibility to apply for funding for short-term international research trips (NAWA PROM)
5. 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 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 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 constent 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=f0f137c4ae4a4ac19af8099bece2fe1e

VI. Submission deadline is **31.01.2026**

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 **17.03.2026**
The results of recruitment will be announced at the PDS IPAS website: https://psd-ipan.ichb.pl/index.php/en/home/

X. 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:

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