INSTITUTE OF PLANT GENETICS 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 Plant Genetics, PAS in Poznan
Procedure no. 6/2026/IGR/PSD

INSTITUTION:	Institute of Plant Genetics, Polish Academy of Sciences
CITY:	Poznan
POSITION:	PhD student
POSITIONS AVAILABLE:	1
SCIENTIFIC DISCIPLINE:	Chemical Sciences
PUBLICATION DATE:	08.04.2026
APPLICATION DEADLINE:	08.05.2026
IPG PAS WEBSITE:	http://www.igr.poznan.pl/en/home-en/
PDS IPAS WEBSITE:	http://www.psd-ipan.ibch.poznan.pl/index-en.html

KEYWORDS: Biological fluids; Macromolecular crowding; Ionic liquids (ILs); Deep eutectic solvents (DESs); Enzymatic cascade reactions (ECR); enzymatic CO_2 fixation.

Research topic: This project aims to enhance in vitro ECRs by addressing the limitations of using single macromolecules as crowding agents, which overlook the complexity of biological fluids. By combining various macro and small molecules in ILs and DESs, the project simulates in vivo cell environments with desired properties close to natural cell environment to understand and improve in vitro ECR kinetics under extreme conditions. This research tackles fundamental biochemical challenges and opens new possibilities for physical chemistry of biological systems and in sustainable chemistry. Additionally, the project will open up a new direction in chemical science, biocatalysis, and biotechnology through biomimetic fluids that mimic complicated intracellular environments. The project results can also make a significant contribution to the green chemistry research field in that they reveal a more detailed knowledge on how ILs and DESs replicate natural cells using multi-molecular crowding agents. The results of multienzyme reactions such as GOx, HRP and CA in MCBNFs will promote in vitro biocatalysis and carbon capture technologies hence contribute to sustainable development goals and environmental chemistry.

Principal Investigator: dr Dibyendu Mondal

DESCRIPTION:

Place of employment: Department of Plant Nanotechnology, Institute of Plant Genetics, Polish Academy of Sciences

Supervisor: dr hab. Gregory Franklin, prof. IPG PAS, **co-supervisor**: dr Dibyendu Mondal

Goal of employment: implementation of the project SONATA BIS 14 no. UMO-2024/54/E/ST4/00113

Scope of research: The doctoral thesis will investigate the hypothesis that combining ILs or DESs with macro- and small-molecular crowding agents will more accurately replicate cellular environments, thereby improving the stability, dynamics, and catalytic efficiency of enzymes in vitro compared to

traditional single-crowder systems. To achieve this objective, we will study enzyme cascades like glucose oxidase (GOx)-horseradish peroxidase (HRP) cascade and carbonic anhydrase (CA) and ribulose-1,5-bisphosphate carboxylase/oxygenase (Rubisco) cascade in Multi-molecularly Crowded Biomimetic Neoteric Fluids (MCBNF). GOx-HRP cascade has been selected as a model enzyme cascade and CA-Rubisco is selected envisaging in vitro enhancement of atmospheric CO_2 fixation to glucose precursor. Detailed analysis of the structure-property relationships, thermodynamic stabilities, and enzyme kinetics will be conducted to improve enzyme stability and substrate diffusion in MCBNF.

Duties in the project: The PhD candidate will participate in the research project according to the established research plan, collaborating with colleagues from the Department. Responsibilities include develop and characterize MCBNFs using ILs and DESs; investigate the stability and kinetics of enzymes (HRP, GOx, and CA) in presence of MCBNFs. Additionally, the candidate will assist in preparing scientific publications and conference presentations, as well as contribute to other ongoing research initiatives within the Department.

Requirements for the candidates:

1. Master's degree in Chemistry, Biochemistry or Chemical biology and related fields.
2. Laboratory experience in the field of green solvents, in particular ILs and DESs.
3. Preferred experience in enzymatic assays, biocatalysis, and biophysical study of IL-protein interactions.
4. Sound knowledge of multienzyme kinetics and protein folding.
5. Basic knowledge of molecular modelling.
6. Ability to use MS Office, Origin, and other related software.
7. Excellent writing and communication skills in English.
8. Independence in performing experiments and teamwork skills.
9. Readiness to start research immediately after the publication of recruitment results.
10. Additional scientific activity (publications, conference communications, and other forms of presenting results, participation in projects, scientific groups, etc.) and organizational activity (e.g., organizing workshops, training, and conferences) are welcome.

Additional information:

1. Research and doctoral theses shall be carried out within the Sonata BIS 14 project entitled "BioFluCas: Designing multi-molecularly crowded biomimetic neoteric fluids to enhance in vitro biological cascade reactions" (UMO-2024/54/E/ST4/00113), funded by National Science Centre, Poland.
2. The PhD student will receive a scholarship in the amount of PLN 5000,00 double gross, for a period of 24 months. After a positive mid-term evaluation, the PhD scholarship will increase to PLN 6500,00 double gross for a period of 24 months.
3. PhD students shall be subject to social insurance, pursuant to the article. 6 section 1 passage 7b of the act of October 13th, 1998, on the social insurance system (Journal of Laws of 2019, items 300, 303, and 730).

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 http://www.igr.poznan.pl/en/main-en/ids-en/poznan-doctoral-school
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 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

ATTENTION: at the stage of the recruitment process, there is no requirement to present documents certified by the apostille clause nor the requirement of nostrification of diplomas. These requirements must be met if the candidate is accepted.

3. **Scientific Europass 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. Additional information is available at: https://europass.europa.eu/en
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. The contact details of at least one previous scientific supervisor or another researcher who is entitled to issue an opinion on the candidate.

Documents in the electronic form (in 1 pdf file) must be sent by e-mail to psd@igr.poznan.pl with the following title: **PhD student–Plant Nanotechnology Team**, supplemented by the **number of the procedure: 18/2026/IGR/PSD.**

For additional information, please contact: Principal Investigator: dr Dibyendu Mondal

e-mail: dmon@igr.poznan.pl

The submission deadline is 08.05.2026

Criteria for evaluation of candidates:

1. Candidate's research achievements, according to the grades obtained in the course of studies, scientific publications, awarded scholarships, and distinctions resulting from conducting scientific research, 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, and experience in other sectors, including industry.
3. Candidate's knowledge of the following disciplines: Chemical Science and Green Chemistry.
4. Knowledge of the subject matter described in the recruitment advertisement.

ATTENTION: The candidate should fill the Europass CV document in a clear and well-organized way. Education section should include at least full name of the University, date of graduation and the theme of master thesis; professional experience section shuld include the exact period of every activity, the role and the main tasks; workshops, training and internship section should consist of the time period, full name of the organization, name of academic supervisor, lecturer; the conferences and publications record should include complete bibliography information and the DOI numbers. **Only the data well described and organized will be taken into consideration. In case of missing data the corresponding record will not be evaluated.**

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.

Announcement of the results: As soon as the position is filled.

Information clause:

Pursuant to 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 (hereinafter General Data Protection Regulation - GDPR), the Employer informs that:

a) the administrator of personal data obtained, collected and processed as a part of the implementation of this agreement is the Institute of Plant Genetics, Polish Academy of Sciences, 34 Strzeszyńska str., 60-479 Poznań,
b) contact with the inspector of personal data protection of the Institute of Plant Genetics, Polish Academy of Sciences in Poznan, is possible at the following e-mail address: iodo@igr.poznan.pl,
c) the basis for data processing is art. 6 par. 1 letter b) and c) of the Regulation referred to above,
d) all personal data provided to the Employer will be kept for the duration of the contract and for a period of 5 years after its completion,
e) in relation to the personal data obtained, the Employer will not make decisions in an automated manner,
f) The Employee is entitled to:
   - based on Article. 15 GDPR - access to personal data
   - based on Article. 16 GDPR - rectify personal data;
   - based on Article. 18 GDPR - request the administrator to restrict the processing of personal data, except to the cases referred to in art. 18 para. 2 GDPR;
   - the right to file a complaint to the President of the Office for Personal Data Protection, if the Employee considers that the processing of personal data by the Employer violates the provisions of the GDPR.