



INSTITUTE OF DENDROLOGY

POLISH ACADEMY OF SCIENCES

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Kórnik, 5/11/2021

**Announcement about recruitment to the Poznań Doctoral School
of the Institutes of the Polish Academy of Sciences
at the Institute of Dendrology Polish Academy of Sciences
No. 36/2021/ID/PSD**

I. Position type: doctoral student

II. Number of vacancies: 1

III. Discipline: biological sciences

IV. Application deadline: 6/12/2021

V. Detailed information about recruitment process can be found on the website:

<http://www.idpan.poznan.pl/index.php/doctoral-school-pds-ipas/information-on-recruitment-at-the-institute-dendrology-pas> and http://www.psd-ipan.ibch.poznan.pl/?page_id=355&lang=en

Research topic: Why cells become smaller to survive? Analysis of tobacco BY2 cells adapted to osmotic and salt stress in the search of key regulatory factors between energy management, molecular homeostasis and the size of the chronically stressed plant cells.

VI. Principal Investigator / Research group: dr Agnieszka Szuba, Laboratory of Genetics and Environmental Interactions

VII. Project Description:

Key Words: adaptation to osmotic stress, molecular status of the plant cell, cell size regulation, 'the new homeostasis state', mitochondria, advanced microscopic imaging, protein turn-over, ribosomes, proteomics, metabolomics, transcriptomics, energy

Project details:

Our latest results of transcriptomic analysis for adapted BY2 cells showed, that the molecular status of plant cells adapted to ionic- and non-ionic stress condition was surprisingly similar to controls. Our planned experiments will verify the existence of the state of 'new molecular homeostasis' and discover how it developed.

Numerous phenotypic observations revealed that plants living in chronic stress conditions are smaller. It is postulated that this decrease in size/mass is a 'cost' of life in stress conditions paid to prevent death. We are very interested in this cost. In our project we plan to study the intensity of energy-consuming processes of protein turnover as a marker of the molecular stability of adapted cells as well as the factor believed to be directly connected with the regulation of cell size.

In our opinion, the most interesting question is: How the coordination between the molecular status – energy management – cell size regulation differ between adapted, stressed and 'control' plant cells. Such knowledge will allow us to find out what is really crucial for the successful adaptation process.

We have an unique experimental system of tobacco BY2 suspension cells gradually adapted to ionic and non-ionic osmotic stress in 2005-2006 y. (suspension cultures will be grown at the Faculty of Biology of the Adam Mickiewicz University, at our partners as part of a scientific consortium).

We plan high-throughput analyzes at the level of the transcriptome, proteome and metabolome (but also transcriptome) made on BY2 tobacco cells and cell fractions. The results of the research planned to be performed by the doctoral student will be analyzed in conjunction with the microscopic results obtained in parallel by our partners from the Faculty of Biology, AMU.

We will also carefully analyze oxidative stress and anti-ROS response as well as the energetic status of analyzed adapted to stress conditions, re-adapted to control conditions and control (kept all the time in control conditions) tobacco BY2 cells.

We expect that the research results will allow them to be disseminated in the best international journals and will be the basis of the doctoral dissertation, and will also be presented at international conferences.

As part of the project, we offer the opportunity to conduct research in an experienced research team (as part of a Institute of Dendrology Polish Academy of Sciences/Institute of Bioorganic Chemistry Polish Academy of Sciences/Faculty of Biology, Adam Mickiewicz University consortium). We provide support in carrying out works based on the last research directions and modern research equipment and experience in publishing research results in leading scientific journals. We create an atmosphere of good cooperation and open exchange of ideas.

The tasks of the doctoral student: The doctoral student will participate in laboratory work mainly in the field of proteomics, metabolomics and transcriptomics, including the isolation and analysis of proteins and metabolites from cells (and cell fractions, in particular from mitochondria, isolated in cooperation with a consortium partner, Faculty of Biology, AMU) of tobacco suspensions BY2. The doctoral student will participate in modern analyzes of tandem mass spectrometry (in close cooperation with the consortium partner: IBCh PAS). The doctoral student will participate in the processing and the publication of the received. As part of the project, participation of the PhD student in international scientific conferences and participation in specialized training in the field of Bio-IT is planned.

VIII. Additional information:

1. Research and doctoral dissertation will be conducted under research project: "Why cells become smaller to survive? Analysis of tobacco BY2 cells adapted to osmotic and salt stress in the search of key regulatory factors between Energy management, molecular homeostasis and the size of the chronically stressed plant cells" UMO-2020/39/B/NZ9/03336, OPUS-20, National Science Center, Poland.



2. The doctoral student will receive a doctoral scholarship in the amount of ca. 4180 PLN gross pay (ca. 3789,00 PLN net pay) monthly during the entire doctoral studies (42 months).
3. The doctoral student will have the social insurance costs referred to in art. 6 clause 1 point 7b of the Act of October 13, 1998 on the social insurance system (Dz. U. z 2019 r. poz. 300, 303 i 730).

IX. Requirements for candidates:

1. Master degree in discipline of biological sciences, forest sciences, Earth and environment sciences or related or meeting the conditions specified in art. 186 section 2 of the Act of July 20, 2018 Law on Higher Education and Science (Dz. U. z 2018 r., poz. 1668 z późn. zm.).
2. Very good skills in spoken and written English, allowing for preparing manuscripts of scientific publications and oral presentations during international conferences.
3. Knowledge and experience in laboratory analyzes in the field of proteomics, metabolomics and genetics.
4. Basic skills in the field of analysis and interpretation of OMIC data (proteomics/metabolomics/transcriptomics) documented by previous scientific activity (e.g.: conferences, publications, etc.).
5. An additional advantage will be the ability in the field of bioinformatics analyzes.
6. Predispositions to scientific and research work, very good organization of work.

X. Required documents:

1. An application to PDS IPAS, including consent for the processing of personal data for the purposes of the recruitment procedure, and a declaration of familiarity with these rules - the current application form is available at <http://www.idpan.poznan.pl/index.php/doctoral-school-pds-ipas/documents-for-candidates-and-ph-d-students>.
2. A copy of the degree certificate confirming graduation or a certificate of graduation; in the case of degree certificates issued by foreign higher education institutions, the certificate referred to in Article 326(2)(2) or Article 327(2) of the Act, giving the right to seek to obtain a doctoral degree in the country under whose higher education system the issuing institution operates. A candidate who does not have the aforementioned documents will be obliged to supply them before being admitted to PDS IPAS. Additional information on foreign diplomas is available on the website: <https://nawa.gov.pl/en/recognition/recognition-for-academic-purposes/applying-for-admission-to-doctoral-studies>.
3. A curriculum vitae showing previous education and employment, information on involvement in scientific activity (membership of student scientific groups, participation in scientific conferences, completed internships and training courses, prizes and distinctions received) a list of publications.
4. A motivation letter, containing a short description of interests, scientific accomplishments, and reasons for wishing to study at the doctoral school.



5. Certificates or other documents confirming the candidate's knowledge of English, if the candidate has such.

6. Contact details of at least one previous academic supervisor or other academic employee who has agreed to provide an opinion regarding the candidate.

The application should be sent by e-mail to the address psd.idpan@man.poznan.pl with the subject "**Competition for the position of doctoral student No. 36/2021/ID/PSD**" in the form of a pdf attachment. If sending by electronic means is not possible, applications sent to the address Institute of Dendrology, Polish Academy of Sciences, Parkowa 5, 62-035 Kórnik, Poland with the note on the envelope "**Competition for the position of doctoral student No. 36/2021/ID/PSD**" are also accepted. Please do not send original documents.

XI. Application deadline: 6/12/2021

Incomplete applications and applications submitted after the deadline will not be considered.

XII. Criteria for assessing candidates:

1. The candidate's academic accomplishments, based on grades attained during studies, scientific and popular science publications, scholarships, awards and distinctions resulting from research or student activity, and other achievements.
2. The candidate's academic and professional experience, based on participation in conferences, workshops, training courses and internships, participation in research and commercial projects, involvement in scientific groups and associations, international and professional mobility, and experience in other fields.
3. Candidate's knowledge in the biological science discipline.
4. Knowledge of the topics listed in the recruitment notice.

XIII. Competition results: 31/12/2021

XIV. A description of the recruitment process can be found in the Recruitment Regulations for PDS IPAS. After the recruitment is completed, unaccepted candidates will be informed of the scores obtained at each stage of the competition.

XV. Admission to PDS IPAS is refused by administrative procedure. The decision may be appealed with to the Director of the Institute of Dendrology of the Polish Academy of Sciences.

XVI. Additional information may be provided Principal Investigator/Research group: dr Agnieszka Szuba, Department of Genetics and Environmental Interactions; aszuba@man.poznan.pl; phone: +48 618170033


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