KStyp(NCN)-2/21 Lublin, 13/07/2021

INSTITUTE OF AGROPHYSICS,
POLISH ACADEMY OF SCIENCES IN LUBLIN
IS SEARCHING FOR HIGHLY MOTIVATED CANDIDATES INTERESTED IN SCIENTIFIC WORK FOR:

PhD FELLOWSHIP (f/m) in the Project:
***„Changes of O-acetylation degree of non-cellulosic polysaccharides during fruit development and ripening and its influence on mechanical properties and microstructure of plant tissue”* no. 2020/39/O/NZ9/00241, financed by The National Science Centre within the funding scheme Preludium BIS 2**

1. **Requirements:**
   a) Candidate cannot be a student of PhD school and cannot hold a doctoral degree
   b) Master's degree in chemistry, biotechnology, biology or related
   c) Good command of English for professional purposes
   d) Experience in laboratory, especially with using analytical chemistry techniques or/and physical chemistry

2. **Job description in the Project:**

The Institute of Agrophysics, Polish Academy of Sciences, Department of Microstructure and Mechanics of Biomaterials is looking for **PhD student** in the Interdisciplinary Doctoral School of Agricultural Sciences.

PhD thesis proposal:
Changes of O-acetylation degree of non-cellulosic polysaccharides during fruit development and ripening and its influence on mechanical properties and microstructure of plant tissue.

- The PhD project will take place for 48 months (from 01.10.2021) at the Department of Microstructure and Mechanics of Biomaterials, Institute of Agrophysics, Polish Academy of Sciences, Lublin, Poland under PhD supervision of Assoc. Prof. DSc Monika Szymańska-Chargot (m.szymanska@ipan.lublin.pl, www).
- The PhD project is conducted and financed within the NCN project PRELUDIUM BIS 2 reg. no. 2020/39/O/NZ9/00241. Scholarship is ensured during the PhD project for 48 months.
- Language of PhD course and thesis: English or Polish.
- **The condition for the candidate's involvement and payment of the scholarship under the PRELUDIUM BIS 2 project is his admission to the doctoral school. For application details (documents, procedures, deadlines) please go to website of the Doctoral School.**

Keywords: apple fruit; fruit development; fruit ripening; polysaccharides; plant cell wall; polysaccharides acetylation

Plant cell wall together with its polysaccharide components is unique Nature creation. The unique properties of cell wall is a result of its composite structure. According to the model of plant cell wall, cellulose microfibrils are interlinked with hemicellulose fibrils via hydrogen bonds, whereas pectins form an amorphous matrix. The structural properties of plant cell wall polymers have been the subject of many studies and have been largely defined. However, the whole picture of interactions between

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the cellulose and non-cellulosic polysaccharides is still unclear. **The project responds to the following questions in this area: how the acetylation degree of matrix polysaccharides change during fruit development and on-tree ripening; how degree of acetylation influences the ability of matrix polysaccharides to bind to cellulose microfibrils and in result how it alters mechanical properties and microstructure of plant tissue. The mechanical properties of cell wall have influence on the fruit texture, which is important indicator of consumer acceptability.**
The apple fruit was chose as a model of fruit development and on-tree ripening, and as it is climacteric fruit also changes in acetylation degree of polysaccharides will be monitored during postharvest cold-room storage. Additionally, as plant cell wall is very complex system and in vivo studies of interaction between plant polysaccharides are very complicated if not impossible the model studies will be conducted to help understand the plant cell wall structure. One of the methods used for the study on model materials is the adsorption technique, which give view of interaction between non-cellulosic polysaccharides with altered acetylation degree and cellulose. The second will be obtaining model cell wall composite in form of film based on cellulose and non-cellulosic polysaccharides with altered acetylation degree to study their mechanical properties.
The final results of project will help to fill in gaps in picture of plant cell wall structure and its function in fruit development and ripening.
References:
1. Szymańska-Chargot, M., Chylińska, M., Pieczywek, P.M., Zdunek, A. Tailored nanocellulose structure depending on the origin. Example of apple parenchyma and carrot root celluloses. Carbohydrate Polymers 210 (2019) 186-195
2. Myśliwiec, D., Chylińska, M., Szymańska-Chargot, M., Chibowski, S., Zdunek, A. Revision of adsorption models of xyloglucan on microcrystalline cellulose. Cellulose, 23 (5) (2016) 2819-2829.

Do not hesitate to contact with Assoc. Prof. DSc Monika Szymańska-Chargot (m.szymanska@ipan.lublin.pl) with any question related to the PhD project.

3. **Funding scheme:** Preludium BIS 2
4. **NSC panel name (Research field):** NZ9
5. **Deadline for submitting applications: 07.09.2021**
6. **How to apply:** in electronic form via our Recruitment System: https://career.ipan.lublin.pl/en/announcements/
7. **Interview: 13-22.09.2021** with the stipulation the deadline can be changed
8. **Results will be announced by: 27.09.2021,** with the stipulation the deadline can be changed
9. **Terms of employment:**
   The successful candidate will receive scholarship for 48 months, under the rules of Act on Higher Education and Science of 20 July 2018 (Journal of Laws [*Dziennik Ustaw*] of 2021 item 478 as amended), and in accordance with the terms of the PRELUDIUM BIS 2 call for proposals, in the amount of PLN 5,000.00 per month, reduced by ZUS due contributions on the side of the scholarship holder and the Institute up to the month mid-term evaluation, and in the amount of PLN 6,000.00 monthly reduced by ZUS due contributions on the side of the scholarship holder and the Institute after a positive mid-term evaluation result. Please be informed the amount stated above also include contributions and benefits payable by the Institute (total scholarship cost), therefore the gross amount of scholarship will be calculated as the above values being reduced accordingly.
10. **Additional information:**
    a) The recruitment process is organized as an open competition. A doctoral student is recruited as part of a competition whose rules are pursuant to 2.1.3 Salaries and scholarships for students and PhD

students - PRELUDIUM BIS 2 doctoral scholarships, Annex to NCN Council Resolution No 95/2020 of 14th September 2020 amending the Regulations on awarding funding for research tasks funded by the National Science Centre as regards research projects https://www.ncn.gov.pl/sites/default/files/pliki/uchwaly-rady/2020/uchwala95_2020-zal1_ang.pdf

b) After the deadline for submitting applications will expire, the Committee may conduct interviews with candidates. In this case, each candidate will be informed individually about the first stage results, as well as the date of the interview.

c) The Institute reserves right to award the fellowship to the candidate ranked 2nd, only if the chosen candidate resigns before signing the fellowship agreement.

d) In the frame of the project we offer three months internship in very good research institution abroad in Germany. PhD student will be required to apply for a fellowship in the program carried out by Polish National Agency for Academic Exchange (NAWA), under the conditions set out in the Cooperation Agreement between NAWA and the NCN of September 12th, 2019.

11. Required documents:

1) letter of application addressed to the Chairperson of the Committee – Assoc. Prof. DSc Monika Szymańska-Chargot
2) Curriculum Vitae with an information about possessed competences, an summary of scientific accomplishments and awards (including in particular: published scientific papers, conference speeches, participation in research projects, internships, training courses as well as other research achievements and scientific distinctions)
3) copy of MSc diploma
4) recommendation letter issued by the research supervisor
5) declaration of availability to work in the Project with the indication of the starting date on 01.10.2021
6) declaration of consent to the processing of personal data contained in the fellowship offer for the needs of the recruitment process in accordance with the example below:

*„I allow my personal data stated in the abovementioned applications to be processed for the purpose of the **recruitment by** the Institute of Agrophysics of the Polish Academy of Sciences (20-290 Lublin, ul. Doświadczalna 4), in accordance with the General Data Protection Regulation (EU) 2016/679."**

*) Information clause on personal data is available on the following website:
http://www.ipan.lublin.pl/wp-content/uploads/2019/02/information-clause-IA-PAS.pdf

If you are interested in this position please send your application via our Recruitment System by 07/09/2021: https://career.ipan.lublin.pl/en/announcements/

We kindly inform that we contact only chosen candidates and also applications that are incomplete, submitted after the deadline or in the different form than required will not be processed.