

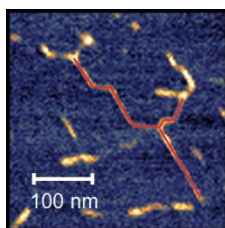
The Institute of Agrophysics, Polish Academy of Sciences, Department of Microstructure and Mechanics of Biomaterials is looking for **PhD student** in the Doctoral School of Quantitative and Natural Sciences. PhD student will receive a scholarship (48 months) in the amount of PLN 5,000 / month (gross).

### PhD thesis proposal:

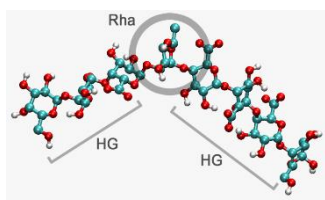
Mechanical role of single rhamnose residues interspersed within the homogalacturonan regions of pectin extracted from plant cell walls.

- The PhD project will take place for 48 months (from 01.10.2020) at the Department of Microstructure and Mechanics of Biomaterials, Institute of Agrophysics, Polish Academy of Sciences, Lublin, Poland under PhD supervision of prof. dr hab. Artur Zdunek ([a.zdunek@ipan.lublin.pl](mailto:a.zdunek@ipan.lublin.pl), [www](#)).
- The PhD project is financed within the NCN project PRELUDIUM BIS. Studentship is ensured during the PhD project.
- Language of PhD course and thesis: English or Polish.
- The PhD candidate should meet the minimum skill standard in chemistry, biochemistry or plant physiology. Master Degree completed before the contract starting date is required.
- For application details (documents, procedures, deadlines) please go to website of [the Doctoral School of Quantitative and Natural Sciences](#).

**Keywords:** cell wall, polysaccharides, carbohydrates, hydrocolloids, enzymes, AFM, molecular dynamic.



Recent studies on plant cell wall assembly have provided strong evidences against the model of an independent cellulose-hemicellulose network embedded in pectic matrix and have supported the idea that pectins are more intimately linked into cellulose microfibrils than previously suspected. The PhD project will focus on pectins extracted from cell wall with sodium carbonate (DASP) that form characteristic molecular structure on mica. The structure originates from a single rhamnose residues interspersed within the homogalacturonan chains. It is hypothesised that this regular structure has a great importance for cell wall integrity and therefore texture and firmness of the tissue. The goal of this research is to identify the mechanical role of single rhamnose residues interspersed within the homogalacturonan regions of the DASP fraction extracted from plant cell wall.



### References

1. Cybulska, J., Zdunek, A., Kozioł, A. (2015) The self-assembled network and physiological degradation of pectins in carrot cell walls, *Food Hydrocolloids*, 43, 41-50.
2. Pieczywek, P.M., Kozioł, A., Płaziński, W., Cybulska, J., Zdunek, A. (2020) Resolving the nanostructure of sodium carbonate extracted pectins (DASP) from apple cell walls with atomic force microscopy and molecular dynamics, *Food Hydrocolloids*, 104, art. no. 105726. <https://doi.org/10.1016/j.foodhyd.2020.105726>

Do not hesitate to contact with prof. Artur Zdunek ([a.zdunek@ipan.lublin.pl](mailto:a.zdunek@ipan.lublin.pl)) with any question related to the PhD project.