

Project Prelude BIS 3 NCN "*Immunomodulating properties of pre-fermented whey beverage enriched with chokeberry juice and colostrum*"

Supervisor: prof. dr hab. Barbara Wróblewska

Study description:

The candidate will carry out a project aimed at investigating the effects of bioactive whey and colostrum proteins and polyphenols of aronia juice, in the form of a pre-fermented mixture with the participation of a potentially probiotic bacterial set developed in earlier own research. The planned task in the first stage will include the determination of proportions/quantitative selection of raw materials in the mixture (chemical analysis) and the determination of optimal pre-fermentation conditions (microbiological analysis). In the next stage, simulated gastrointestinal digestion of the components and their pre-fermented mixture will be carried out and biological activity of the obtained hydrolysates will be analysed using a human intestinal epithelial cell model (Caco-2, cancer cells and HIEC-6, healthy cells). Epithelial cells will be cultured under standard conditions and in the state of induced inflammatory reaction (in the presence of bacterial lipopolysaccharide, LPS). The measured parameters of immune response of epithelial cells (cell proliferation, level of immune response markers: cytokine expression and level of interleukins of pro- and anti-inflammatory pathway) will allow to unequivocally determine the immunoregulatory potential of the components and their pre-fermented mixture.

Implementation of the project will include: ongoing analysis of the scientific literature, planning and execution of experiments and laboratory and statistical analyses, interpretation of obtained results, conclusions, as well as preparation and presentation of research results at scientific conferences, and writing the scientific publications from ongoing research.

Requirements:

1. Higher education (completed upper second degree) in agricultural sciences in the discipline of food and nutrition technology or biological sciences (biotechnology, biology) or related;
2. Basic knowledge of food technology and/or cell biology;
3. Knowledge of basic analytical food testing (total protein, dry matter, fat, sugar, etc.), molecular biology techniques (e.g. RT-PCR, qPCR, Western blot, flow cytometry), microbiology (lactic fermentation, microscopy of bacteria), in vitro digestion and cell culture, and statistical analysis. Lack of knowledge of any of the above analyses does not exclude the candidate from employment.
4. Availability: willingness to complete a six-month research internship in a foreign research centre;
5. Good written and oral communication skills in English;
6. Motivation to scientific work, good work organisation, ability to work individually and in a team.

Highly regarded scientific enthusiasm!

Conditions of employment:

1. The selected candidate must be a participant in the Interdisciplinary Doctoral School in Agricultural Sciences co-run by the IRZBŻ PAN in Olsztyn. The recruitment schedule and rules are available at Recruitment 2021 - Institute of Animal Reproduction and Food Research, Polish Academy of Sciences in Olsztyn;
2. Planned start date of the project: 1 October 2022 (start of the academic year 2022/2023 at the PhD school);
3. Place of work: Department of Immunology and Microbiology of Food, Institute of Animal Reproduction and Food Research, Polish Academy of Sciences in Olsztyn, 10 Tuwima Street, 10- 748 Olsztyn;
4. The amount of the doctoral scholarship: 4276 PLN gross (approximately 3800 PLN net) per month, after two years the scholarship amount is increased according to the regulations of the Prelude Bis3 project;
5. Maximum duration of the scholarship: 48 months;
6. Performance of a six-month scientific internship in a foreign scientific centre.

Required documents:

1. Cover letter;
2. Curriculum vitae (CV), including: a. education, b. scientific achievements, including scientific publications, popular science articles, conference proceedings, c. achievements in scientific research, scholarships, awards, scientific experience, scientific workshops and trainings and participation in research projects, d. competence to perform the tasks provided for in the project;
3. Document confirming the completion of second-cycle studies;
4. Opinion of the thesis supervisor confirming possession of skills necessary to conduct research work;
5. Other documents specified in the announcement published on the website of the Interdisciplinary Doctoral School in Agricultural Sciences at the Polish Academy of Sciences (Appendix no. 1 to the Recruitment Rules).

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