INSTITUTE OF BIOCHEMISTRY AND BIOPHYSICS
POLISH ACADEMY OF SCIENCES

1. **Research Unit:** Laboratory of Plant and Microbial Biology
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4. **Auxiliary supervisor**: dr inż. Magdalena Górecka
5. **Project title (English):** The role of HopAG1 effector in virulence of plant pathogenic bacteria.
6. **Project title (Polish):** Rola efektora HopAG1 w wirulencji bakteryjnych patogenów roślinnych
7. **Description of the project (up to 500 words):**

Bacterial pathogens cause significant losses in worldwide plant production. To develop new and effective methods for plant protection we need better understanding of molecular processes determining pathogens virulence and plant resistance. *Pseudomonas syringae* is a frequent causal agent of bacterial diseases of plants. It is equipped with a syringe-like structure for injection of proteins called effectors directly into the host cell. Usually, the effectors target specific host proteins involved in defence mechanisms, therefore, are highly dangerous for plants. Each strain of *P. syringae* employs a repertoire of effectors, which controls the infection course and determines the host range.

In our laboratory we developed a pipeline to analyse type three effectors of *P. syringae.* We have already ascribed a function of HopBF1 effector and we have revealed various aspects of HopQ1 function. In this project we use this approach to study the uncharacterised effector family - HopAG1.

Our initial observation indicates, that this protein may act in different compartments of the plant cell, including the nucleus and chloroplasts which suggests, that it may misregulate various vital processes. Bioinformatics predictions revealed, that HopAG1 is divided into three regions, which may exert different enzymatic activities *i.e.* ADP-ribosyltransferase, kinase, nudix hydrolase. Additionally, HopAG1 possibly undergoes modifications in the plant cell, which we hypothesize may act as a molecular switch changing the structure of the effector and thereby turns on/off its various activities.

8. **References related to conducted /planned research (maximum 3)**:

Lopez et al. 2019 doi: 10.1016/j.cell.2019.08.020
Giska et al. 2013 doi: 10.1104/pp.112.209023

9. **Scholarship amount (net):** 3000 PLN for mid-term evaluation, after mid-term evaluation, change to 57% professor's remuneration (currently it would be 3242 PLN net).