Flax is a valuable crop plant cultivated in our climate zone and is one of a few crop plants that give two types of products – fibre and oil. The fibres are of a good quality, and the oil contains unsaturated fatty acids beneficial for human health. Additionally, flax seeds contain numerous other valuable components including vitamins, phytosterols and lignans. Flax oil and fibres are used in many industrial products, and establishing new improved varieties may further broaden their use. Also the compounds considered as waste-products (shives, seedcake) are the source of valuable components like phenolics, which make flax perfectly suitable for the "zero-waste" slogan, because all its parts may be used in various branches of industry. The cultivation of flax is however restricted by environmental stress factors, but the biggest crop losses worldwide are caused by fungal infections.

In Poland, the main cause of losses in the flax crops is fusariosis. Due to the *Fusarium* ability to survive in soil for long periods, it is essential to identify fusarium wilt resistance mechanisms and develop resistant flax varieties. In pants many aspects of plant development and interaction with environment are realised via signalling molecules called plant hormones. While roles for some of them, like salicylic acid, are fairly well established for others like abscisic acid their function requires further studies. The abscisic acid (ABA for short) derives its name from abscission, the shedding of leaves and one of the earlies functions established for this signalling molecule. Its role and mechanisms of action for many environmental stresses, like draught, are well recognised, however the role of ABA in plant resistance remains controversial. For long time higher ABA levels were associated with increased disease susceptibility however recent research indicates that ABA can have both negative and positive impact on plant resistance and this depends on the plant, tissue infected, stage of disease and pathogen type.

The aim of this project is to investigate the role of ABA in flax-*Fusarium oxysporum* interaction. Based on preliminary data, we assume increased ABA level in flax leads to improved pathogen resistance. We plan to test this hypothesis by analysing transcription of genes involved in ABA metabolism and signalling and hormone levels during plant infection and further verify it by creating plants deficient in ABA signalling and evaluation of disease progression.

More detailed knowledge on the interaction between flax and this soil-borne fungus could lead to the discovery of more efficient ways to control fusarium wilt in the future.