

**„Plant productivity and food safety:  
Soil science, Microbiology, Agricultural Genetics and Food quality”  
15-17.09.2021 r.**

First day (15th of September 2021)

**Session I: Plant-microbial interactions**

Session Chair: Prof. Katarzyna Hrynkiewicz

Microorganisms can interact with plants through the rhizosphere, phyllosphere and endosphere which may positively or negatively affect plant growth and development. These microbes form non-symbiotic associations as free living soil microbes or as saprophytes, while some form symbiotic plant association's such as the mutualistic interactions of mycorrhizae, nitrogen fixing bacteria and the hidden colonizers i.e. the endophytes, or the parasitic interactions of the plant pathogens. The type and structure of the plant-microbial community depends on several abiotic and biotic factors e.g. plant genotype, development stage, composition of exudates, climate, soil composition, nutrient availability, microbial species and function.

Research on understanding the basis of plant-microbe interaction has gained interest today as it paves for a more sustainable and environment friendly future in agriculture. The positive effects of Plant growth promoting microorganisms (PGPMs) may be (i) direct - providing nutrients synthesized by microorganisms or released by them to the environment and thus making them available to the plant and / or (ii) indirect - reducing or eliminating the harmful effects of phytopathogens. Application of this available resource as bio-formulations will increase the productivity of plants and contribute to reduce the progressive degradation of agricultural land by the application of fertilizers. The protection of plants with the use of bioinoculants against the adverse effects of biotic and abiotic stresses is consistent with the assumptions of sustainable agriculture.

Research subjects includes:

- impact of environmental factors on plants microbial diversity,
- microbiome of plant rhizosphere, endosphere and phyllosphere,
- selection of beneficial microorganisms for increasing plant productivity,
- techniques in preparation of bioinoculants for commercial application,
- role of PGPMs in biotic and abiotic stress mitigation of crops,
- evaluation of compatibility between PGPMs and plant genotypes.

