

**„Plant productivity and food safety:
Soil science, Microbiology, Agricultural Genetics and Food quality”
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Session III: Plant lipids engineering for sustainable future

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The current global trend oriented towards production and use of sustainable lipid-based products is the result of many diverse factors acting directly on economies in both, developing as well as developed countries. Of these, the most important are: 1) rapidly growing human population, 2) strong reduction of arable land resulting from recent negative climatic changes, 3) gradual exhaustion of global fossil fuels and unstable petroleum prices. The major advantage of plants is the natural ability for CO₂ assimilation and its conversion to lipids of high-energy content, mainly in the form of triacylglycerol (TAG). Thus, they gained a strong attention as a potential source of energy-rich lipids. These lipids in turn are the sustainable feedstock for food and biofuels production. However, the dilemma of choice between using plants for energy or food production requires development of novel strategies oriented towards boosting the lipid production in plants. One of the most powerful tools to achieve this goal is modern genetic engineering which allows for efficient regulation and modification of pathways governing lipid synthesis and accumulation in diverse plant tissues.

Research subjects includes:

- molecular aspects of lipid synthesis and accumulation in plants,
- genetic control of lipid homeostasis in plant cells,
- biotechnology of plant lipid metabolism,
- employment of synthetic biology for increasing plant energy density,
- use of plant biomass as a lipidic feedstock.

