

Večna pot 111, SI-1000 Ljubljana

Vabilo na seminar / Invitation to Lecture

Prof. Dr. Heribert WARZECHA

»OPPORTUNITIES AND CHALLENGES OF PLANT BIOTECHNOLOGY FOR THE PRODUCTION OF ACTIVE SUBSTANCES«



Četrtek / Thursday 8. 11. 2018, ob / at 14:30 Predavalnica B5 v Biološkem središču, Lecture Hall B5 of the Biological Centre, Večna pot 111, Ljubljana

Abstract:

Plants have evolved an enormous variety of biosynthetic pathways affording formation of diverse chemical structures. These so-called specialized compounds enable the plant to interact with its environment, are vital components of its defense systems, and they are valuable to us as they can serve as fragrances, dyes, or pharmaceuticals. The potential of synthetic biology and metabolic engineering is to allow the design of plants as green bio-factories of fine chemicals, but the requisite platform and technology are still in their infancy. This is mainly due to the complex orchestration of metabolic pathways between cell compartments, cell types, and plant organs. On top of that, the genetics underlying most of the known metabolic routes has not yet been resolved completely.

Exemplified by metabolites derived from tryptophan, we were able to show that simple biosynthetic routes can be grafted into tobacco plants, both by stable integration as well as transient expression. Moreover, combining genes from various, highly disparate sources spurred the formation of entirely new synthetic pathways leading to new-to-nature plant-generated products, as shown for halogenated indigo-precursors. Modular cloning techniques enabled the assembly of pathways comprising up to 12 steps, but their evaluation showed that careful design of regulation and localization is needed and tunable expression levels of biosynthetic genes are crucial to unlock their full bio-manufacturing potential.

Professor Heribert Warzecha studied Pharmaceutical Sciences at Mainz University and holds a PhD in Pharmaceutical Biology. After a research stay at the Boyce-Thompson-Institute for Plant Research at the Cornell University in Ithaca, NY, he obtained his habilitation in Pharmaceutical Biology and Botany in Würzburg. In 2007, he moved to Darmstadt and is now heading the research group Plant Biotechnology and Metabolic Engineering at the Technische Universität. His main research focus is the production of pharmaceuticals in plants and the engineering of metabolic pathways for the production of novel ingredients. He was chairing a pan-European research network (COST) devoted to plant metabolic engineering (www.plantengine.eu).

You are cordially invited to attend this lecture, which will be delivered in English.

Izr. prof. Matjaž Kuntner