



Univerzita Karlova
Přírodovědecká fakulta
KATEDRA BIOCHEMIE



ZVE NA SEMINÁŘ

Elucidation of the biosynthetic pathway of psychoactive kavalactones in kava using *de novo* transcriptomics and metabolomics



Dr. Tomáš Pluskal

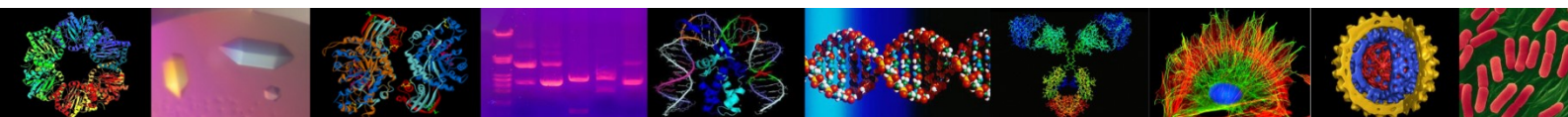
(ÚOCHB AV ČR v.v.i., Praha)

Pondělí 19.10. 2020, 9:50

Přednáška bude přenášena prostřednictvím Google Meet

<https://meet.google.com/iwy-anpg-thg>

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Abstract

Although plants are an incredibly rich source of pharmaceutically relevant specialized metabolites, biosynthetic pathway elucidation in plants has proven challenging. Unlike bacteria and many fungal species that contain biosynthetic operons, the genes of a given plant typically scatter randomly across the genome, making pathway discovery via genome mining nearly impossible. Leveraging a diverse set of molecular tools developed for studying specialized metabolism in non-model organisms, we recently characterized seven enzymes that constitute the biosynthetic pathway of kavalactones, the psychoactive principles of the Polynesian ethnomedicinal shrub kava (*Piper methysticum*). Kavalactones interact with the human central nervous system through mechanisms distinct from those of conventional psychiatric drugs like benzodiazepines or opioids. I will further demonstrate the feasibility of engineering heterologous production of kavalactones and their novel derivatives in yeast, thus opening an avenue towards the development of novel psychiatric therapeutics using synthetic biology tools.

Curriculum Vitae

Education

2014 Ph.D. in Molecular Biotechnology, Hiroshima University, Japan (Hiroshima University)

2004 M.Sc. in Computer Science, Charles University in Prague, Czech Republic

Research experience

2020 – present **Junior Group Leader**, Institute of Organic Chemistry and Biochemistry (IOCB), Czech Academy of Sciences, Czech Republic

2020 (2 months) **Visiting Scientist**, Institute for Molecular Science, Japan

2015 – 2020 **Postdoctoral Fellow**, Whitehead Institute for Biomedical Research (MIT), USA Advisor: Dr. Jing-Ke Weng

2015 (1 month) **Visiting Scientist**, Steno Diabetes Center, Denmark

2005 – 2015 **Technician** (until 2014) and **Postdoctoral Scholar** (from 2014) Okinawa Institute of Science and Technology (OIST), Japan

2003 (5 months) **Special Research Student** Japan Advanced Institute of Science and Technology (JAIST), Japan

Teaching experience

2017 – present Mentoring students in mass spectrometry software development through the **Google Summer of Code program**

2016 – 2019 **Mentoring MIT Undergraduate Research Opportunities Program (UROP)** students

2004 – 2005 **Lecturer** in Computer Science, *University of Finance and Administration*, Prague, Czech Republic