Katedra biochemie,
Centrum regionu Haná pro biotechnologický a zemědělský výzkum,
Přírodovědecká fakulta UP v Olomouci
a
Česká společnost chemická – olomoucká pobočka

Vás zvou na přednášku

Probing metabolomes in disease and disease models using quantitative and dynamic approaches

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Anotace: The biochemical rationale for a quantitative metabolomics approach can be realized considering that approximately 30 percent of the human genome is coding for proteins with catalytic activity hence, the relative metabolome composition of a given biological system part such as a cell, will reflect upstream biochemical events such as transcription, translation and protein activity. Quantitative profiles can therefore act as readout for catalytic activity from which mechanistic understanding of the system can be inferred. Our research is focused on this last step of translating metabolic profiles into biochemical understanding of the system studied and in this lecture a few examples will be discussed.

1. Over the last decade, quantitative metabolomics technology has gained momentum for disease biomarker discovery. However, dividends in terms of new biomarkers for clinical use have been scarce. We have explored serum metabolic profiles from various human diseases and can present a model for why this seems to be the case.
2. Using quantitative metabolomics and RNA sequencing technology we have investigated chemotherapeutic resistant cancer cell models and can demonstrate that metabolic rewiring is a major aspect of drug resistance in cancer and it will be illustrated how this potentially could be exploited for therapy selection biomarkers and new therapeutic strategies.
3. The cellular ATP to ADP ratio, which ultimately is controlling the entire metabolism, is regulated with a precision better than one part in 109 on a time scale of seconds to minutes. Therefore, we can assume that the general metabolism constantly and rapidly is being modulated by means of increased/decreased catalytic protein activity in order to avoid quantitative accumulation/depletion of specific metabolic intermediates. We have explored means of using stable isotopes for probing dynamic aspects of the metabolome which will be presented..

Přednáška se bude konat v úterý 24. února od 15:00 v aule PřF, 17. listopadu 12, Olomouc.

prof. Vilím Šimánek, DrSc.
předseda pobočky ČSCH

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