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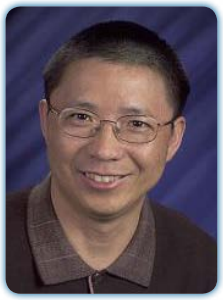

Jian Zhi Hu

Pacific Northwest National Laboratory, USA

High resolution NMR metabolomics on biological tissues and live objects

Metabolomics studies on biological tissues are of significance since a disease is often associated with a specific tissue or organ malfunction. In this talk, high resolution NMR metabolic profiling techniques on biological tissues and live objects will be discussed. I'll start with traditional liquid state 1H NMR metabolic profiling on tissue extracts using metastatic melanoma in C57BL/6J mouse spleen as an example to illustrate the procedures and methods associated with tissue extraction, metabolic profiling, data analysis, biostatics and bioinformatics. With this example, we are able to identify 73 metabolites with estimated concentrations in spleen tissue ranged from as low as 6 uM to as high as 25 mM in the hydrophilic extracts of a spleen. The second part of the talk will cover the topic of high resolution magic angle spinning (MAS) NMR metabolomics on intact biological tissues. Fast MAS using a sample spinning rate of several kHz or more that is destructive to the integrity of a biological tissue will be discussed first, followed by slow-MAS NMR metabolomics using a sample spinning rate of 40 to about 200 Hz that is essentially non-destructive to biological tissues and even small intact live biological objects such as live insects and bugs. Finally, ultra-slow MAS NMR metabolomics using a sample spinning rate of 1-6 Hz will be introduced that is non-destructive to a live laboratory animal such as a mouse.

Biography

Jian Zhi Hu has completed his PhD at the age of 32 years from a Joint-Training Program between Wuhan Institute of Physics, the Chinese Academy of Sciences and the Department of Chemistry, University of Utah, USA, and Postdoctoral studies from University of Utah. He is a senior staff scientist and principal investigator of Pacific Norwest National Laboratory. He has published more than 160 papers in reputed journals. He received one US R&D 100 award and is a holder of 8 issued US patents.

Jianzhi.Hu@pnnl.gov

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