

Mass Spectrometry for Multimodal Imaging of Lipids in Brain Tissue

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Propositions for the defence of the thesis

Mass Spectrometry for Multimodal Imaging of Lipids in Brain Tissue

Karolina Škrášková, 3rd March 2016

1. Perhaps the two greatest scientific questions (of this century) are “*How did the Universe come into being?*” and “*How does the brain work?*” (D. F. Swaab: *We Are Our Brains*)
2. Comprehensive information on local tissue composition can be reached by the combination of mass spectrometry imaging and separation techniques in a single analytical approach. (*This thesis*)
3. Desorption electrospray ionization should be incorporated into the multimodal MSI workflow of a single tissue section to deepen the obtained molecular information. (*This thesis*)
4. Robust computational methods dealing with data reduction, chemometrics and image co-registration are critical in the field of mass spectrometry imaging. (*This thesis*)
5. Mass spectrometry imaging researchers would benefit from a database of standardized sample preparation protocols. (*This thesis*)
6. The proposed protocol for multimodal mass spectrometry imaging will contribute to the molecular understanding of the brain and to the monitoring of lipidome alterations related to its pathological states. (*This thesis, Valorisation*)
7. A successful implementation of mass spectrometry as a tool for intra-operative *in situ* molecular characterization of tissue will revolutionize clinical practice.
8. Neurodegenerative diseases, mental disorders and stroke are currently incurable and as such they have a great impact not only on the patients quality of life but also represent a significant economic burden for the society. (*R.M. Adibhatla et al. Future lipidology, 2007. 2(4): p. 403-422*)
9. It is the *dynamism* of our knowledge, not its *rigidity*, that allows for a constant improvement of the understanding of the world around us. (*This thesis*)
10. Moving labs during one’s PhD research is an enriching experience due to the many challenges it brings.
11. Nothing surprises me. I am a scientist. (*Harrison Ford as Indiana Jones*)