

# 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, 3<sup>rd</sup> 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*)