

## B. Sc./ M. Sc. student thesis project

### Topic: High resolution measurements of the proteomic content of tumor tissue samples

Brief description: Mass spectrometry imaging (MSI) is a technique that allows the evaluation of molecules directly on tissue. This gives the opportunity to further investigate tissue components and, by correlating it with histopathology, it is possible to gain further understanding about disease development. At the Institute of Pathology of the Technical University of Munich, we have been evaluating different tumor tissues with MSI utilizing state-of-the-art instrumentation and tackling some of the current bottlenecks of the diagnostic process. However, for certain tumor types we consider that higher resolution of the analysis is crucial for the understanding of the molecular interplay that leads to the development of certain tumor types. As we employ matrix-assisted laser desorption/ ionization (MALDI) as the ionization method of the molecules in the sample, defining the best resolution for the measurement also requires changes in the sample preparation procedure. A thorough test and evaluation of the procedures must be conducted to achieve the most accurate outcome. One of the steps of the sample preparation that will impact the most the measurement resolution is the matrix deposition. In MALDI, the application of a matrix is essential for the sample ionization. When depositing the matrix, crystals form on the surface of the sample. In turn the size of those crystals will impact the efficacy of the laser to ionize the molecules. Therefore, one of your main tasks would be to carry out a systematic study to evaluate the effect of the resolution and sample preparation on the characterization of the proteomic profile of the different tumor tissue samples.

During this project you will have the chance to gather a good understanding about mass spectrometry imaging, solid knowledge about proteomics, some insights into tumor pathology method development.

Please note that these projects require availability for laboratory work (*in loco*) of at least 2 days a week.

If you are interested, send us an email introducing yourself and letting us know why you think this is a fitting project for you. If you have questions or would like further information about the projects, feel free to get in touch:

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