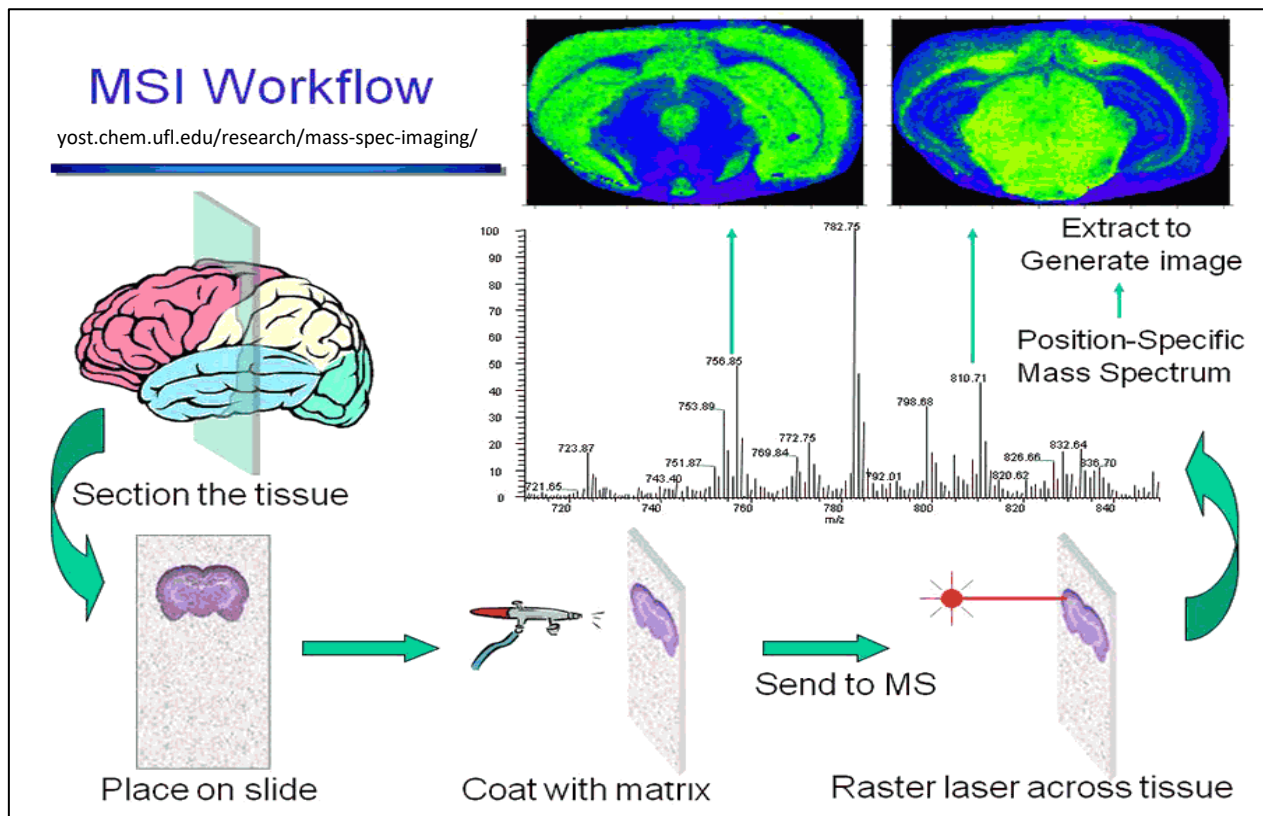


1. THE BRAIN AFTER RESTORATION OF BLOOD FLOW FOLLOWING ACUTE ISCHEMIC STROKE
2. CORONARY ARTERIES FOLLOWING IMPLANTATION OF DRUG ELUTING STENTS

Mass spectrometry imaging (MSI) is a technique that allows you to determine the chemical fingerprint of materials and tissues with spatial resolution by interrogating it with ionizing laser beams and subsequent mass spectrometry analysis of the ionized molecules. At Erasmus MC we are using matrix assisted laser desorption ionization (MALDI) MSI (see figure below) that employs a chemical layer, a matrix deposited on



tissue, to assist in ionizing the molecules of interest. We are using this technique to study the chemistry of cardiovascular and cerebrovascular tissues in health and disease. The depth of data requires a bioinformatics approach and employs dedicated software programs such as MATLAB and mMass to analyse and order the data, focusing on specific regions of interest.

BRAIN For the imaging of the brain, we are interested in studying changes in lipid profile in infarcted rat brain tissue and the unaffected 'healthy' rat brain tissue. Magnetic resonance imaging (MRI) performed during the stroke provided various regions of interest within the infarct tissue and changes in lipid profile will help determine the pathophysiological processes involved. Ultimately, this could lead to new potential treatments for the large number of people who suffer acute ischemic stroke.

CORONARY ARTERIES For the imaging of the coronary arteries, we are interested in measuring arterial drug levels after implantation of drug-eluting stents, the most common intervention to treat atherosclerosis. Specifically, we want to understand how drug distributes in the arterial wall and how arterial wall composition affect the distribution and concentration of drug. Understanding pharmacokinetics and pharmacodynamics of drug in different types of tissues (e.g. lipid-rich atherosclerotic plaque, fibrotic plaque, calcifications, ...) would help improving drug-eluting stent efficacy in terms of drug delivery.

BSC AND/OR MSC PROJECTS MASS SPECTROMETRY IMAGING OF BRAIN & CORONARY ARTERIES

We are looking for bachelor and master students who are interested in mass spectrometry imaging, transport processes and disease modelling and who would like to pursue a bachelors and/or master thesis in these areas, preferably experienced in MATLAB.

For more information on project 1 (Brain) please contact: Aladdin Taha (a.taha@erasmusmc.nl) or Joaquim Bobi i Gibert (j.bobiigibert@erasmusmc.nl)

For more information on project 2 (Stents) please contact: Francesca Razzi (f.razzi@erasmusmc.nl; f.razzi@tudelft.nl)