

Mass spectrometry–guided surgery

Currently, there is no universally applicable method for intraoperative tissue identification. While it is critical to precisely detect malignant tumor tissue during cancer surgical interventions, all of the presently used methods suffer from a number of drawbacks, ranging from narrow application field (e.g. fluorescent labeling methods) through low specificity (sonography) to extremely long analysis time.(intraoperative histology). In contrast to these methods, mass spectrometry has the potential to offer rapidly available, highly specific information using Rapid Evaporative Ionization MS (REIMS) technology. Our research is focused on the development of mass spectrometric instrumentation compatible with the surgical environment. This comprises the construction of mobile instruments with low noise emission (< 70 dB). One of the great challenges of the project is to develop appropriate ion transfer devices. Since atmospheric inlet of mass spectrometers cannot be brought to the close proximity of patients, ions have to be transferred to 2-3 m away from their site of formation. This problem is solved presently by using Venturi-pump and PTFE tubing, however alternative solutions are also under testing.

