



SEMINAIRE ISMO

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Vibrational spectroscopy for medicine. From the lab in to OR.

Vibrational spectroscopy is well known to be an excellent tool for the study of the different molecular systems providing spectral “fingerprints” of the molecules thus allowing their identification and characterization. Therefore it has a high potential for the applications in medical diagnostics. One of the most important challenges is the tumour cells detection. Biology and thus molecular composition of healthy and malignant cells are different; therefore these differences should be potentially detectable using spectroscopic approaches. Despite of numerous studies ranging from infrared microscopy to nonlinear laser spectroscopy, spectroscopic techniques are still far from being used in medical clinics for tumour diagnostics. Complicated data analysis and need for the sample removal and preparation for the measurements are the major obstacles.

It has recently been shown by our group that ATR-FTIR spectroscopy can be used for the fast discrimination between cancerous and normal kidney tissues by analyzing the collected spectra of the tissue touch imprint smears based on the appearance of the specific spectral signatures due to the glycogen molecules in the 950 cm^{-1} to 1250 cm^{-1} spectral range, without the need of the advanced statistical data treatment. The problem of the sample preparation and transfer to the measuring instrument was addressed by developing portable spectrometer quipped with fiber ATR probe and a sensitive liquid nitrogen cooled MCT detector. The design of the fiber probe allows the ATR tip to be changed easily in order to use only new sterilized tips for each measurement point of the tissue. This setup allows direct measurements of the tissues in situ and in vivo during the surgical procedures. The possibilities and future challenges of the application of the vibrational spectroscopy for the medical diagnostics will be presented in the talk.

Mardi 3 décembre 2020 à 11 h
Amphithéâtre du bât 520 (3^{ème} étage)
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