Proposition for an Associate Professor position
(one year from 1st September 2010)

Multiphoton study of oral cancer lesions

The work is on a collaborative project between the unity EA4203, Faculty of Odontology at the University of Montpellier 1 (Dir. Frederic Cuisinier) and the team of Bionanophotonics in the GES UMR 5650 University Montpellier 2 (resp. Csilla Gergely).

The goal is to develop a biophotonic aide for detecting premalignant oral tissue lesions by autofluorescence of endogenous fluorophores naturally present in tissues. The basic idea of the research to be performed is that the fluorescence response of the tissue must be modified due to changes in the microenvironment of the fluorophore. These "markers" of various natural changes can help us in the differentiation between malignant and normal tissues. The technique used in these studies will be mainly the multiphoton microscopy, a valuable imaging technique that has attracted much interest in the biological sciences due its capabilities to inherent optical sectioning. Due to the good penetration depth of the IR laser beam multiphoton microscopy has become a powerful tool in deep imaging of tissue. In addition to the two photon excited fluorescence signals produced by the multiphoton excitation process, nonlinear phenomena such as the generation of second harmonic (SH) provide useful information on the structure and optical properties of a specimen. The simultaneous detection of multiphoton fluorescence and SHG allows the co-localization of biologically significant fluorescence signals with the structural information corresponding to the SH.

Contact

Csilla Gergely
Professeur-Biophysique
Université Montpellier II
GES- UMR 5650 CNRS
34095 Montpellier Cedex 05 France
tel: 33(0)467143248
fax: 33(0)467143760
e-mail: gergely@ges.univ-montp2.fr
http://biophysique.ges.univ-montp2.fr/