

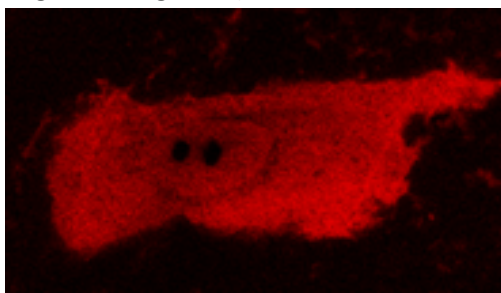


PhD Offer

Electrochemiluminescence microscopy of cell membranes

Electrochemiluminescence (ECL) is the process of light emission by the excited state of a luminophore upon electrochemical stimulation. The remarkable characteristics of ECL as a powerful and ultrasensitive analytical method are successfully exploited in numerous immunoassays. Such ECL-based assays are currently commercialized for the diagnostics of a large number of pathologies, such as for cardiac and infectious diseases, thyroid and tumour markers, etc.

The goal of this PhD is to develop our recently-reported technology of ECL microscopy for single cell imaging (J. Am. Chem. Soc. 2017, 139, 16830; J. Am. Chem. Soc. 2018, 140, 14753). We demonstrated the use of ECL as a surface-confined microscopy to image single cells and some specific membrane proteins (see below the ECL image of a single cell).



In this PhD project, the student will work on the following steps:

- 1) labeling of the entire cell membrane or some specific membrane proteins.
- 2) to test iridium and ruthenium ECL luminophores emitting at different wavelengths.
- 3) imaging by ECL microscopy the cells and comparison with fluorescence.

We plan also to image also some smaller organelles such as mitochondria in order to extend our imaging approach and to investigate its spatial resolution. In brief, the student will work with microscopy, fluorescence, electrochemistry as well as the manipulation of living cells.

Keywords: Microscopy, fluorescence, electrochemistry, cell labeling, spectroscopy

Applicant profile: Background in physical chemistry or chemistry.

Financial support: Expected fellowship from the Ministry of Research.

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