

Séminaire Physico-chimie & Biologie

Vendredi, 5 Décembre 2014

11 :00

Bât. 563 - salle 15

Towards The Computation Of 3D-Chemical-Maps And The 3D Visualization of Thick
Biological Specimens

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Abstract:

Description of cellular structures has been crucial for the understanding of normal and pathological life processes. However, for a long period of time, the depiction of cell components was limited to static two-dimension draws or pictures. Emergence of fluorescence microscopy and electron tomographies overcame this limit by adding a temporal and/or spatial dimension with improved accuracy and resolution. Nowadays, afore mentioned developments, allow a new challenge, thus far impossible, being accessible: the 3D study of the chemical elements distribution in the cell. 3D chemical mapping unlocks new prospects in the understanding of pathologies, such as neurodegenerative diseases by providing access to the detailed visualization of metal accumulation in the cellular volume; in nano-medicine by characterizing the location and composition of internalized nano-particles; or in basic research, by making possible the tracking of labelled drugs. Uses and limitations of acquisition procedures, 3D tomographic methods and freeware for 3D chemical mapping will be presented and illustrated by examples on biological applications. A particular attention will be paid to describe new approaches allowing the observation of thick biological specimens (thick > 700nm).