

**Research field:** Radiation-matter interactions / Solid state physics, chemistry and nanosciences

Cellular biology, physiology and cellular imaging / Life Sciences

**Title:** Real time imaging of ionization track. Application to undirect effect in radiobiology and low doses effect.

**Abstract:** The interaction between ionizing radiation and biological materials (DNA, proteins, membranes, water?) is essential for understanding and treating radio-induced diseases such as cancer, mainly by hadrontherapy in the future. Modeling of these interactions by using Monte Carlo simulations is currently not satisfactory due to the lack of comparisons with clear and visual experiments.

This project consists in carrying out an experiment with a microscope (micrometer resolution), a triggered video camera (nanoseconde resolution) in line with the ion accelerator in CEA at Saclay delivering single ion shots. This experiment is actually almost designed and set. The project is to improve the setup to allow the studies of luminescent and fluorescent molecules and to link with cellular media. Comparisons will be done with laser irradiations, ion beam and electron beam with various fluencies and various energies.

The ultimate aim is situated upstream in the radiation induced biological effects scale and is focused on low dose effects to understand the processes responsible for the bystander effect.

**Location:** Institut rayonnement et matière de Saclay  
Service Interdisciplinaire sur les Systèmes Moléculaires et les Matériaux  
Laboratoire de Radiolyse (LCF)  
Starting date: 01/10/2010  
Centre : Saclay

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**More about:** <http://iramis.cea.fr/scm/radiolysis>  
[http://iramis.cea.fr/sis2m/Phoce/Vie\\_des\\_labos/Ast/ast\\_technique.php?id\\_ast=315](http://iramis.cea.fr/sis2m/Phoce/Vie_des_labos/Ast/ast_technique.php?id_ast=315)

**University/Graduate School:** Paris XI



**DSM**

**SL-DSM-10-0401**



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