

## Light-triggered delivery of therapeutic oligonucleotides with plasmonic gold nanoparticles

<b>Location:</b> CentraleSupélec and ENS Paris-Saclay, Gif s/Yvette Campus, Université Paris-Saclay	
<b>Laboratories:</b> Light, Matter and Interfaces (LuMIn) Biology and Applied Pharmacology lab. (LBPA)	<b>Web sites:</b> <a href="http://www.lumin.universite-paris-saclay.fr/en">http://www.lumin.universite-paris-saclay.fr/en</a> <a href="https://lbpa.ens-paris-saclay.fr/">https://lbpa.ens-paris-saclay.fr/</a>
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### Scientific project

Most cellular dysfunctions in many diseases result from the expression of mutated or deregulated genes that overexpress proteins. Gene therapy revolutionizes the treatment of these diseases by turning off a defective gene using an oligonucleotide (DNA, RNA). In addition, gold nanoparticles under illumination at their plasmon resonance behave like miniature converters of light into heat. When illumination is achieved by ultrashort laser pulses, the heating is brief, intense and very localized. Our project makes it possible to perform, quantify and optimize the intracellular delivery of oligonucleotides for gene therapy. The DNA is grafted onto nano-cargoes consisting of gold nanorods coated with a silica layer. The delivery is controlled by laser-induced local photothermal conversion, using precise thermal management at the nanoscale, and quantitatively assessed by *in vitro* and *in vivo* analyses. This project, lead together with the *Laboratory of Biology and Applied Pharmacology* (LBPA, CNRS-ENS Paris-Saclay), has been awarded financial supports from *Institut d'Alembert* in Ecole Normale Supérieure Paris-Saclay and *labex Nano-Saclay*.

### Requested profile

The candidate has a background in physics (optics, condensed matter, nanoscience) or physical chemistry. Additional training or experience in fluorescence microscopy or/and cell biology will be appreciated. He/she has a strong taste for multidisciplinary research.

### 16-months post-doctoral position