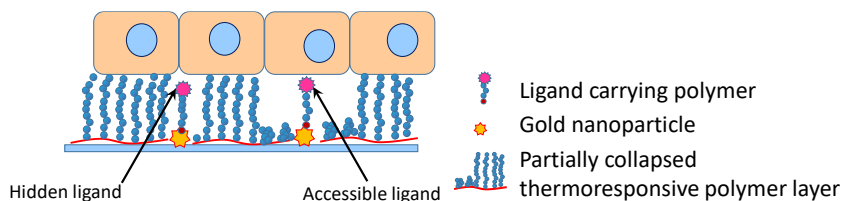


M2 Master Internship Proposal
PASTEUR laboratory (ENS) and SIMM laboratory (ESPCI)

Photosensitive hydrogel coatings for controlling cell adhesion

Mammalian cells are in constant interaction with their environment. They interact with the extracellular matrix via membrane receptors called integrins, which specifically recognize the tripeptide sequence RGD [1]. The density of ligands on the surface is of crucial importance for cell response. In order to reproduce these phenomena, we plan to create a platform capable of both controlling ligand density and modulating its accessibility by light stimulation.

Our strategy is to use a surface-grafted and cross-linked poly(*N*-isopropylacrylamide) hydrogel. PNIPAM is thermo-stimulable polymer and switches from a swollen state to a collapsed state at around 32°C [2]. This could be used to modulate ligand accessibility and hence cell adhesion [3]. To convert the temperature stimulus into a light stimulus, one of the aims of this thesis is to use gold nanoparticles (GNPs) which, by thermoplasmonic effect, produce heat locally under light irradiation [4]. This surface will then be modified using a microfluidic device to graft a gradient of ligand onto the surface [5].



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Location of the internship:

PASTEUR – ENS Paris. 24, rue Lhomond. 75005 Paris
SIMM - ESPCI Paris. 10, rue Vauquelin. 75005 Paris

Contact:

yvette.tran@espci.fr
emmanuelle.marie@ens.psl.eu