INSTITUT NEEL Grenoble

Post-doctoral position

Development of large-pores mesoporous silica nanoparticles grafted with aptamers for the controlled delivery of anti-microbial peptides

Context and objectives:

Antibiotic resistance will be one of the greatest public health problems in the future and this situation requires the search for novel treatment approaches. Antimicrobial-peptide (AMPs) could represent a reliable alternative to overcome this issue because they have many advantages such as low propensity for resistance development, rapid bactericidal and broad-spectrum activity. The encapsulation of the AMPs into nanosized carriers could help to overcome these drawbacks. Moreover, it may provide adequate protection from enzymatic degradation. In the last decade, encapsulating AMPs has been performed in several nanostructures such as liposomes, micelles, metallic nanoparticles, nanofibers, mesoporous silica nanoparticles (MSNs), hydrogels.

The use of these delivery systems generally improves the AMPs *in vitro* antimicrobial activities but does not bring any concrete solution to their lack of specificity. The aim of this project is to develop AMPs delivery systems with a high affinity and specificity for target bacterium in order to enhance their properties and to limit their toxicities. In order to increase the antimicrobial activities of AMPs and to confer upon them high affinity and specificity against target bacterium we propose to use Aptamers/(MSNs) hybrid materials.

The recruited post-doc will develop new protocols for the synthesis of well-dispersible mesoporous silica nanoparticles with controlled dispersity and pore size. He/she will develop methods for the functionalization of these nanoparticles with aptamers and for the characterization of the resulting hybrid materials.

Possible collaboration:

We will work in close interaction with our collaborators involved into this ANR project: mostly DPM in Grenoble, but also Chrono-Environnement in Besançon.

Required profile:

The candidate should hold a PhD and have a solid background in nanoparticles synthesis, surface functionalization, colloidal stability, and in various techniques used for the characterization of nanoparticles.

Foreseen start for the position: April 2021
Salary: Between 2648.79 € and 3054,06 € gross salary according to experience
Duration: 12 months

Any application should be sent on the webpage: https://bit.ly/34LDrrh

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