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FACULTY OF PHARMACEUTICAL SCIENCES

Laboratory for General Biochemistry and Physical Pharmacy | biopharmaceutics nanomedicines biophotonics

LECTURE INVITATION

Extracellular and intracellular targeting: how to design responsive nanomedicines?

Prof. Jeanne Leblond Chain

The lecture will take place on Thursday 1st of June 2023 at 10.30h in seminar room 0.2 Gertrude Elion

Faculty of Pharmaceutical Sciences, Ottergemsesteenweg 460, 9000 Ghent, Belgium.

Registration not required.

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Abstract

Targeting nanomedicines to specific organs - other than the liver -, tissues or cells has raised a lot of efforts from drug delivery scientists these last years. Significant progress has been made to better understand the biological barriers and the role of several parameters (size, surface chemistry, protein corona, …) on the fate of nanoparticles after intravenous injection. In our group, we have focused our efforts on two biological barriers: (i) the endosomal escape, (ii) the selective binding to receptors overexpressed on the cell surface. To overcome endosomal escape, we have designed pH-switchable lipid nanoparticles, able to change conformation upon protonation at endosomal pH values, leading to the destabilization of the lipid bilayer and thus to the fast release of the nucleic acids into the cytosol. This system has shown its ability to deliver drugs and genes *in vitro* and *in vivo*, with similar efficiency than commercial transfection agents and lower toxicity. To favor selective binding of nanoparticles, we have examined the binding of a series of nanoparticles coated with poly(ethylene glycol) and an aptamer-tethered ligand, and deciphered the crucial parameters to favor selectivity towards highly dense receptor surfaces. Both strategies are aimed to develop better targeted nanomedicines for RNA delivery.

Biography

Jeanne Leblond Chain is Associate Researcher at INSERM in the ChemBioPharm team directed by Philippe Barthelemy within the laboratory ARNA (Natural and artificial regulations of RNA) at the faculty of pharmacy of University of Bordeaux since 2019. She leads the group of "Targeted Aptamers, Medicines and Sensing" focused on the development and therapeutic applications of aptamers and nanomedicines.

Equipped with an engineer degree in organic chemistry, she got her Ph.D. at Faculty of Pharmacy at University Paris V in France where she developed new synthetic vectors for gene therapy. She joined Prof. Leroux's team in University of Montréal for postdoctoral studies in 2006. Then she joined the Faculty of Pharmacy as assistant professor in 2011 and left Montréal in 2019 as associate professor. She directed the Gene Delivery Laboratory for 8 years, which developed stimuli-responsive systems for intracellular delivery of genes and drugs, as well as the research axis "Drug Formulation and Analysis" for 3 years. Her multidisciplinary background enables her to conduct research from the chemical design until the *in vivo* proof-of-concept. In her new group, she is interested into supramolecular assemblies of lipids and aptamers for smart delivery systems.

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