

Advancing nanomedicine by studying the nano/bio interface

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Nanomedicines have significantly impacted the way we treat cancer and infectious diseases. The size and surface properties of these technologies impact how they engage biological environments, and these interactions differ from those of conventional drugs. My laboratory is focused on understanding the crosstalk between biology and nanoparticles of different composition. In this presentation, I will provide an overview of our activities, focusing on how we combine nanotechnology and in vivo pharmacology to understand how to make more efficacious and better tolerated nanodrugs.

Nicolas Bertrand is a pharmacist by training. He received his PhD from University of Montreal under the supervision of Prof. Jean-Christophe Leroux, and post-doctoral training at the Massachusetts Institute of Technology in the laboratory of Prof. Robert Langer. In 2015, he joined the Faculty of Pharmacy of Université Laval, as an assistant professor. He was promoted to full professor in 2024. From September 2025 to August 2026, he will be a visiting scientist at Université de Bordeaux, in the ARNA laboratory.

His laboratory focuses on understanding the pharmacology of nanomedicine, specifically how nanomedicine interact with complex biological environments. His team has developed various tools to monitor the pharmacokinetics of liposomes and polymer nanoparticles in rodents. The laboratory is also very interested in understanding the intricate interactions between nanomaterials and the immune system.

Host: Jeanne Leblond Chain, ARNA laboratory