

# Faculté de pharmacie

## Séminaire de l'axe

« Formulation et analyse du médicament »



### « Zeta-Potentials in the nanosciences : Understanding Nanoparticle Architecture from Electrophoretic Mobility »

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Pavillon Jean-Coutu

S1-111 – 11h00

*À l'invitation du professeure Jeanne Leblond Chain*

Measuring and reporting nanoparticle (NP) zeta-potentials are nowadays routine, expedited by the proliferation of electrophoretic light scattering instruments. Zeta-potentials are also measured using electroacoustic methodologies, as well as by gel- and capillary electrophoresis. Despite its ubiquity, the zeta-potential does not have a universally accepted definition or use, and its interpretation is challenging, particularly for nanoparticles, which often have a complex core-shell structure. Consequently, many reports of zeta-potential furnish limited value across disciplines, because important contextual information is missing. This talk will address the connection between nanoparticle architecture (core-shell structure, charge, size, permeability, etc.) and the fundamental measurement, which is the electrophoretic mobility. The electrophoretic signature, calculated theoretically by systematically varying the ionic strength, will be examined for several common nanoparticle architectures, among which are PEGylated inorganic NPs, stealth liposomes, and polyelectrolytes. The model will be applied to data for gold NPs bearing PEGylated coronas with peripheral charge. Recent advances to model charge regulation and NP gel electrophoresis will be presented, with an interpretation of charge reversal and an outlook for protein coronas.