

# Séminaire de l'axe Pharmacométrie et pharmacothérapie

## Applications of Quantitative Systems Pharmacology Modeling in Oncology



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Jeudi 29 avril 2021 – 11h00 – Via Zoom

à l'invitation de la professeure Fahima Nekka

Immunotherapy has shown great potential in the treatment of cancer; however, only a fraction of patients responds to treatment, and many experience autoimmune-related side effects. The pharmaceutical industry has relied on mathematical models to study the behavior of candidate drugs and more recently, complex, whole-body, quantitative systems pharmacology (QSP) models have become increasingly popular for answering questions in translational and early development stages. Furthermore, QSP modeling has the potential to discover novel predictive biomarkers as well as test the efficacy of treatment plans and combination therapies through virtual clinical trials.

In this talk, we present a QSP model developed for neoadjuvant therapy in non-small cell lung cancer. The model was able to capture the variability of the response observed in the patient population with measured tumor mutational burden and quantified antigenicity of mutations in their tumors. Our experience with building this model motivated us to organize the QSP model building process into a modular toolbox named QSP-IO to enhance model reusability and improve speed by which immunology models are built and deployed to answer translational and clinical questions. This modular platform allows for the construction of models with varying degrees of complexity based on the research and development questions.