

# Quantitative studies to facilitate nanoparticle risk assessment to humans

Level: Master

Start: Anytime

Project form: literature review and data processing, data analysis or model development

Supervision: Bingqing Lu

Contact: [bingqing.lu@ru.nl](mailto:bingqing.lu@ru.nl)

Nanoparticles (NPs) are widely used in industry and technology due to their small size and versatility, which makes them easy to enter organisms and pose threats to human and ecological health. Non-targeted NPs from environmental exposures may occur due to contact between NPs and the human skin or respiratory tract. NPs have wider biological effects after entering the bloodstream. Trapping of NPs by the reticuloendothelial system in immune system may lead to the potential toxicity of NPs. Consequently, it is important to quantify the influence of NPs properties on the NP biodistribution to minimize toxicity of NPs.

Quantitative structure–activity relationship (QSAR), as valuable low-cost and highly efficient evaluation tools to maximize the information contained in existing experimental data and predict missing information while minimizing animal testing, have been used to assess the biological response of different chemicals/NPs. In this study, you are free to select the most interested biological response of NPs (e.g. elimination) and try to model it based on an ‘easy’ QSAR- multiple linear regression. [Fig. 1](#) shows the framework of this study. The work can be divided into two tasks, 1) data collection and processing; 2) development of QSAR. The properties of NPs are easily obtained from literatures. This study can provide a dataset on NPs behavior in tissues, and provide mathematical estimation of NP biodistribution, expecting to facilitate human risk assessment to NPs.

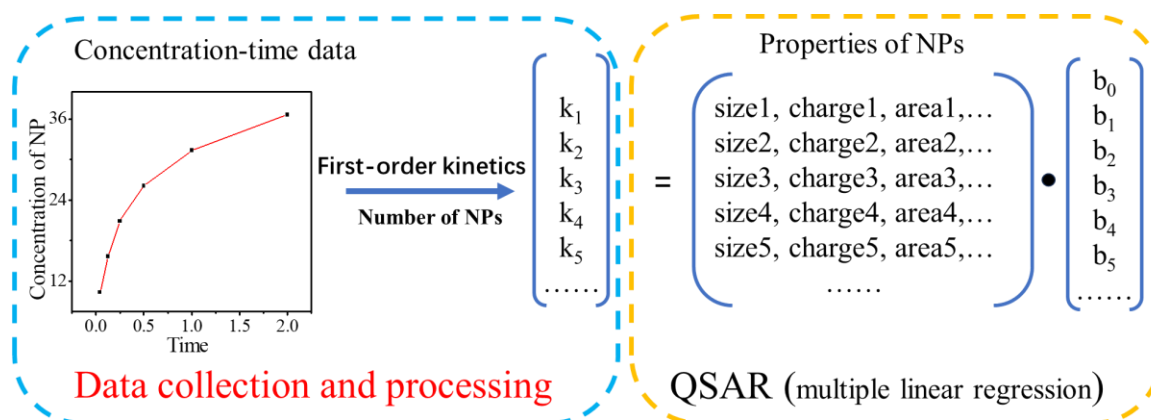


Figure 1. The framework of nano-QSAR for prediction of NP biodistribution.