Development of antiviral compounds

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Polyanionic compounds have shown to be promising antiviral therapeutics. Many viruses seek Heparan Sulfate Glycans (HSPG) as a first binding site to infect host cells. Our group has developed macromolecules that mimic HSPGs and irreversibly destroy the viral particles before they can infect the host cells. This is part of an interdisciplinary project that spans from the synthesis, purification and characterization of small molecules, to grafting onto a variety of cores that are then tested in many biological settings: in cell cultures, in mimics of human tissues and also in animal studies.

The goal of this project is to develop and execute synthetic routes to generate a library of candidate compounds that are tested against viruses such as Herpes simplex 2, Respiratory Syncitial Virus and more importantly, Sars-CoV-2, among others. This project focuses on the synthesis of small molecule compounds to help us understand the mechanism of action of these HSPG-mimics and the role of hydrophobicity in causing the destruction of the viral particles without causing toxicity to the host.
