A path to faster and more cost-effective drug development

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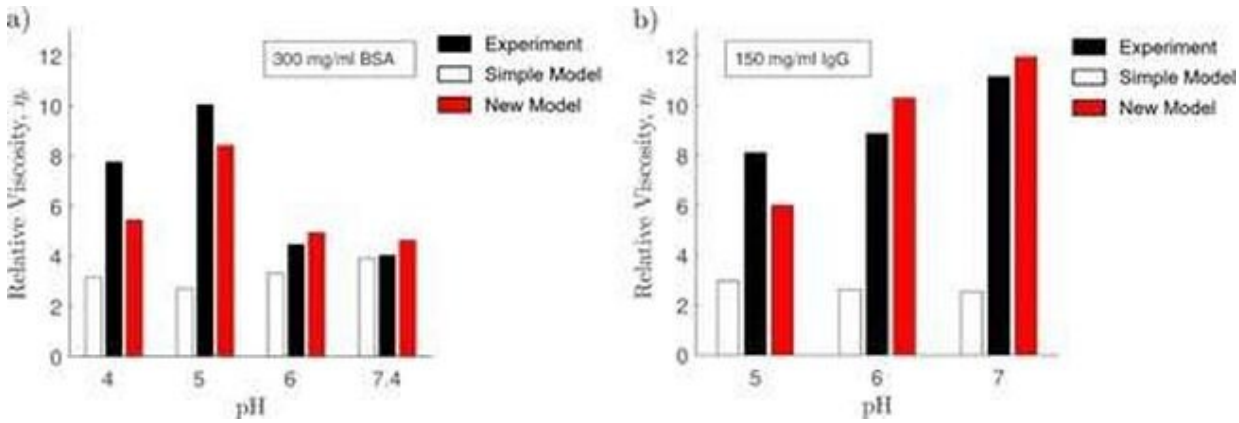

Credit: *Molecular Pharmaceutics* (2022). DOI: 10.1021/acs.molpharmaceut.2c00582

Researchers at Rensselaer Polytechnic Institute (RPI) have published research in *Molecular Pharmaceutics* predicting how proteins interact in drug development. The research is a collaboration between Amgen and the University of Michigan–Ann Arbor. In the paper, researchers use a mathematical model to predict the viscosity of solutions of proteins to be used as drugs. This is critical in drug development as the viscosity determines the method of delivery—needle or IV.

Traditionally, the viscosity testing is done at a later stage of drug development. This testing reveals whether a molecule or a fluid has too

high a viscosity. If it is too viscous, it will be too thick or have too much friction to flow freely in a needle.

In drug development, molecules need to have low viscosity from the start. The unpredictable drug development process can be delayed or set back when the materials are too viscous.

Discovering a way to determine viscosity earlier in the development process will shorten the process, and also reduce costs in drug development and, therefore, reduce costs to patients.

"Our aim is to identify protein interactions behind the complex viscosity behavior of dilute to semi-dilute protein solutions," said Patrick Underhill, Professor of Chemical and Biological Engineering at RPI.

"Further, coupling between the interactions is important for designing therapeutic protein formulations where low viscosity is desired at high concentrations. Ultimately, this will have a positive impact in drug delivery and cost."

More information: Sabitoj Singh Virk et al, Application of a Simple Short-Range Attraction and Long-Range Repulsion Colloidal Model toward Predicting the Viscosity of Protein Solutions, *Molecular Pharmaceutics* (2022). DOI: 10.1021/acs.molpharmaceut.2c00582

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