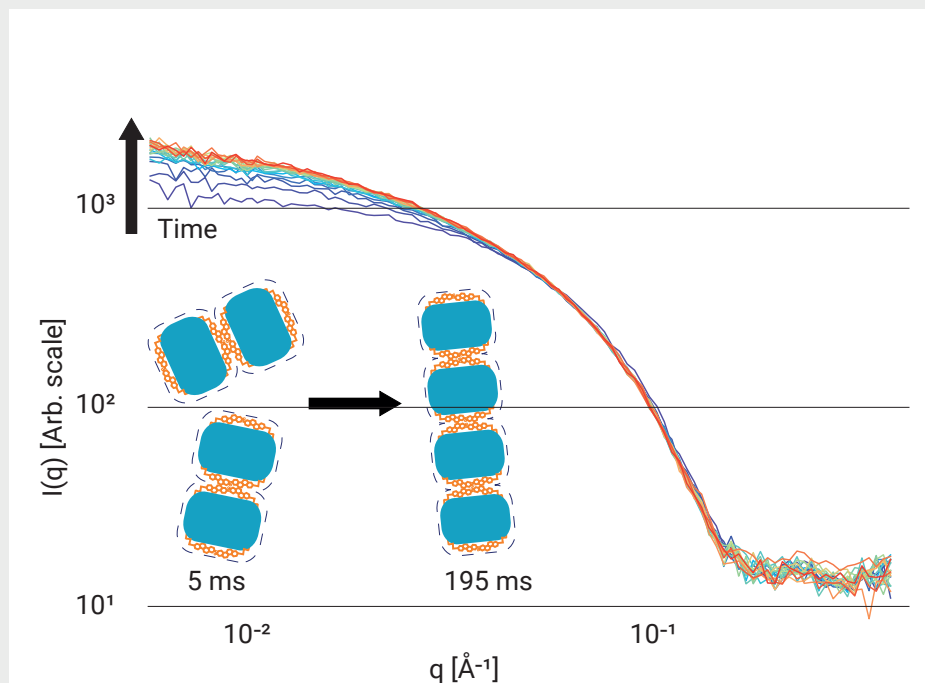


SAXS Analysis of Protein-Based drugs

Control of solution properties of protein-based drugs is of crucial importance for drug formulation to optimize stability, pharmacological properties, and release profile. In this project, scientists from University of Copenhagen and Novo Nordisk collaborated on developing methods for studying the solution structure of protein-based drugs using X-ray and neutron based small-angle scattering techniques (SAXS and SANS).

Novo Nordisk are already routinely using SAXS extensively but require software for fast analysis of large amounts of SAXS data, and customized tools for modeling different molecular formats than simple proteins. Furthermore, testing the feasibility of using neutrons and advanced time-resolved techniques is of interest for future R&D in Novo Nordisk.



What we did

- Software was developed to enable fast analysis of the large amounts of SAXS data obtained at Novo Nordisk
- Models for the scattering of chemically modified proteins were developed
- SANS experiments on modified protein-polymer complexes with different parts highlighted were performed
- Time resolved SAXS experiments with millisecond time resolution performed on insulin undergoing structural changes (see box)

What's next?

The next step will be an ambitious project studying structural changes under conditions mimicking subcutaneously injected protein-based drugs.

When insulin is transferred to a water based solvent that mimics the conditions when injected, it undergoes a structural change. This change is observed on a millisecond time-scale with the stopped-flow SAXS technique.

In the LINX project, researchers at leading Danish universities collaborate with scientists in industry to solve industry relevant problems using advanced neutron and X-ray techniques. The Arleth group at University of Copenhagen contributes with their expertise in small-angle scattering techniques.

Read more
linxproject.dk

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