Title: SAXS studies of Pro-rich peptides and peptidomimetics

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Description: Antimicrobial peptoids have been found to aggregate at concentrations considerably higher than their minimal inhibitory concentrations (MICs). In this project such peptoids and peptide-peptoid hybrids will be examined by small-angle X-ray scattering (SAXS) with respect to aggregation at lower concentrations closer to their MICs. Also, Pro-rich antimicrobial peptides (PrAMPs) constitute an interesting compound class that acts via intracellular targets (e.g., as inhibitors of translation). These peptides appear to adopt unusual conformations (different from standard α-helices or β-sheets), which makes them interesting subjects for examination by SAXS to assess whether their actual conformation is extended or highly folded.

Moreover, in the literature the activity of some PrAMPs have been reported to be different for the naturally occurring and the synthetic peptides with the same amino acid sequence. A report found that this may be explained by a difference in cis/trans ratio of the Pro residues, since treatment of a PrAMP with a cis/trans isomerase altered the activity of the synthetic peptide so that it gained potency similar to the original PrAMP isolated from a natural source. Therefore, the structure before and after treatment with this isomerase will be estimated by SAXS.

The practical work in the project involves some solid-phase synthesis (including purification and characterization), while the main focus will be the biophysical characterization via determination of their hydrodynamic radius via SAXS.

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