Structural evaluation of the interaction between the prion protein and Ascidian dermatan sulfates

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Introduction The cellular prion protein (PrP^{c}) is an α-helix rich protein that can suffer alterations in your native conformation, converting itself into your pathogenic isoform (PrP^{Sc}), turning to a β-sheet rich structure. This conversion may lead to the appearance of progressive and lethal diseases known as transmissible spongiform encephalopathy (TSEs), involving the formation of amyloid aggregates associated to the neurodegeneration process. There is still no effective treatment that prevents or fights TSEs efficiently. Glycosaminoglycans (GAGs) are PrP ligands that have been tested as inhibitors for prion conversion. Commercially available GAGs are obtained from mammalian samples, which exert contamination problems, including by PrP^{Sc}. Therefore, non-mammalian GAGs are interesting alternatives for therapeutic use. **Objectives:** We aim to evaluate the interaction of mammalian PrP with dermatan sulfates (DS) extracted from the ascidians *Styela plicata* and *Phallusia Nigra*, elucidating protein structural changes, stability, aggregation and conversion. **Material and Methods** We isolated DS from ascidians' viscera, and obtained murine PrP by recombinant expression. We used light scattering, circular dichroism, and fluorescence measurements in order to provide information on the chemical and physical properties of the interaction. **Results and Discussion** The results show PrP interaction with DS, indicating DS structural patterns important for biding. **Conclusions** Many questions about the mechanisms involved in TSEs still must be elucidated. The characterization of new compounds that could act as inhibitors of the conversion is important for the search of new anti-amiloidogenics and/or anti-prionics.

***Keywords*:** Aggregation. Ascidian. Dermatan Sulfate. Glycosaminoglycans. Prion.