Self-Assembly of Protein Fibrils into Supra-Fibrillar Aggregates: Bridging the Nano- and Mesoscale

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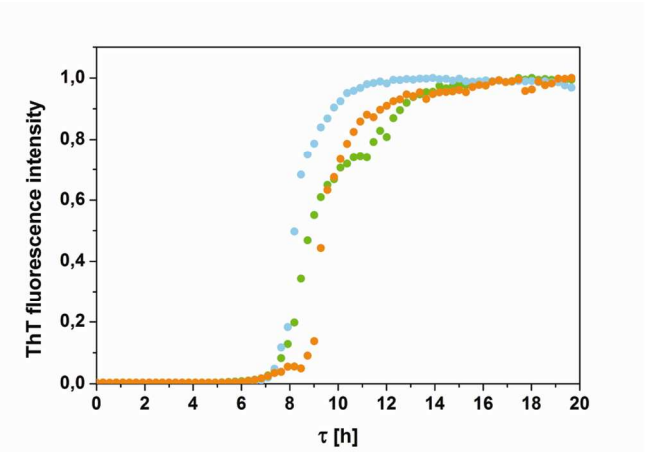

Figure S1. Time resolved ThT fluorescence intensity curves obtained during formation of αS supra-fibrillar aggregates (SFAs). The aggregates were formed at 100 μM αS, 2.5 mM$CaCl_2$, 10 mM Tris, pH 7.4 and 37 ^{o}C. The three curves correspond to three separate samples incubated at identical aggregation conditions.

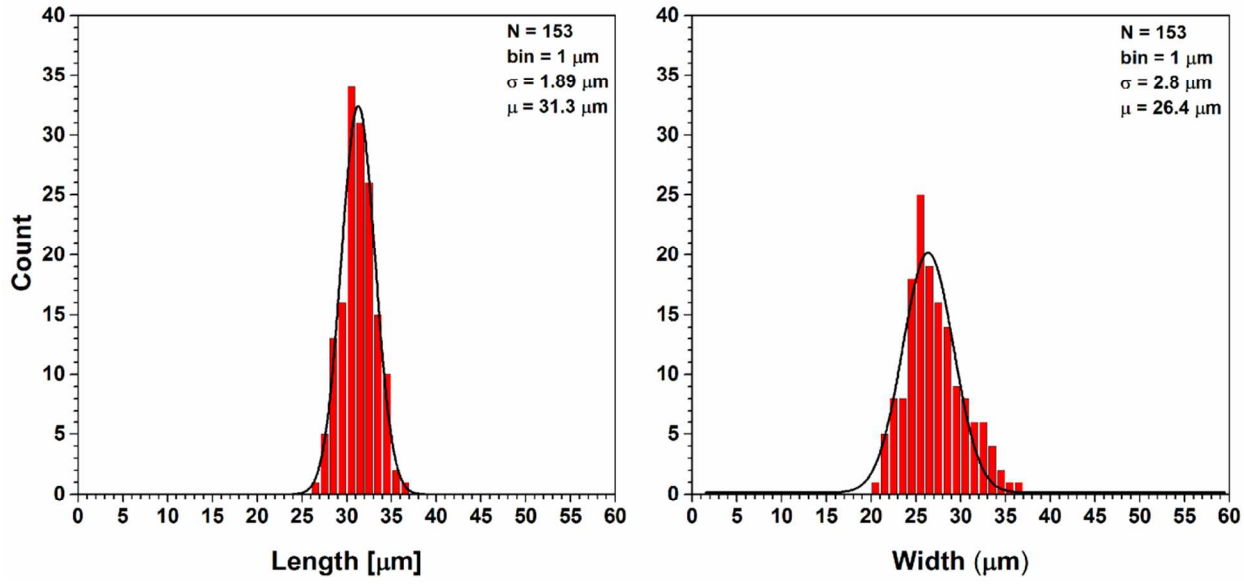

Figure S2. Length and width distribution of the SFAs formed at 100 μM protein concentration, 2 mM $CaCl_2$, 10 mM Tris buffer, pH = 7.4, 37 ^{o}C and in the presence of 5 μM Thioflavin T.

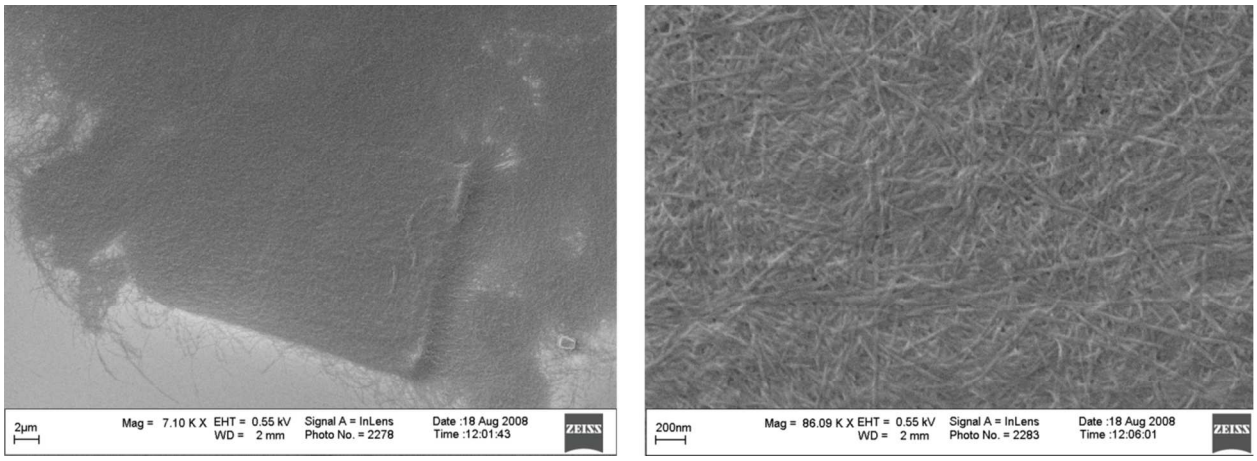

Figure S3. HRSEM micrographs of a supra-fibrillar aggregate. A top view (left) and a zoomed image (right) at the surface of the aggregate.

SI 1 Estimation of the water content in the supra-fibrillar aggregates

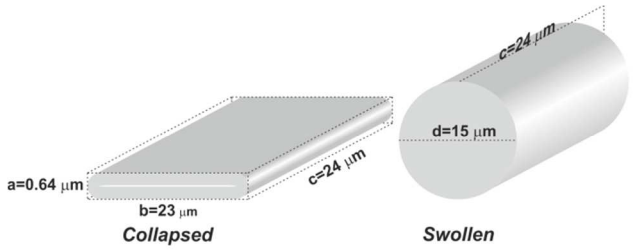

Figure S4 Geometrical configurations of a swollen and dried supra-fibrillar aggregate used to estimate the water fraction.

In order to estimate the volume of the hydrated and dried aggregate we assume that for both species the circumference P of the cross section remains the same as the aggregate is being dried and collapsed on the mica surface, or:

$$\boldsymbol{P = \pi d = 2(a + b)} \qquad 1$$

This approximation seems reasonable since there were no cracks or integrity breaches observed (AFM micrographs) at the top layers of the aggregates that would suggest spreading of

the collapsed structures .We also approximate the shape of the collapsed aggregate to a rectangle depicted with dash lines in Figure . Using equation1**Error! Reference source not found.**we can calculate back the diameter of the swollen aggregate and subsequently its volume:

$$\boldsymbol{V_{swollen} = \frac{c\pi d^2}{4} = \frac{c(a+b)^2}{\pi} \approx 4271\ \mu m^3} \qquad 2$$

The volume fraction of the water then can be easily estimated:

$$\boldsymbol{1 - \frac{V_{collapsed}}{V_{swollen}} = 0,92} \qquad 3$$