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Intermediate oligomeric states of ferritin

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Ferritin is a typical protein cage structure which is formed from 24 polypeptide subunits by the process named self-assembly. An assembled globule of ferritin is shaped into a hollow sphere with the key function of iron storage [1]. Thus, ferritin is able to store up to 4500 iron atoms within its shell [2] in the form structurally similar to ferrihydrite (5Fe2O3·9H2O) [3]. Ferritin is commonly used in structural biology due to its stability in a wide range of conditions (in particular, thermal and different pH). This globular protein also has a plea of biophysical and biomedical applications, especially in drug design [4]. It is crucial to understand the process of self-assembly for the purposes of drug development, for example, recombinant ferritin-based vaccines.

In this work we investigated different oligomeric states of ferritin by small angle scattering (SAS) using recombinant protein complexes based on ferritin from H. pylori. We defined macro parameters such as Rg, Dmax and Vp for different fractions obtained by size-exclusion chromatography (SEC) the samples of ferritin exposed to highly basic pH.

We supposed that these macro parameters correspond to monomeric, dimeric and 24-meric states. In addition, there are evidences of an octomeric state of ferritin, but that part is underdiscussed in this report and requires some further investigation.

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Literature list

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