15A/2011G188

Structural study of hNck2 SH3 domain protein by X-ray solution scattering II. pH-dependent structural change.

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Introduction

hNck2 SH3 domain protein takes β-structured protein at neutral pH. However, Liu and Song found it takes α-helix-rich conforamation at acidic pH by means of NMR spectroscopy and CD [1].

We have started the study on pH-dependent structural change of hNck2 SH3 domain protein by X-ray solution scattering, and reported in three reports. The first report (the present one) shows pH-dependent monomer-dimer transition, the second one reports conformational study at pH 2, and the third one report gross structures at pH 2 and pH 8.

Experimental

X-ray scattering experiments were done at the beamline of 6A, keeping the sample-to-detector-distance at c.a. 1.3 m with a CCD-based X-ray detector (Hamamatsu Photonics, C7300). The obtained data were corrected for image distortion, non-uniformity of sensitivity, and the contrast reduction on X-ray image intensifier.

Concentration of hNck2 SH3 domain was 3 to 4 mg/mL. At these concentration, the protein forms dimer at pH 6 [2]. All experiments were done at 12℃.

Results and Discussion

Figure 1 shows X-ray scattering patterns of hNck2 SH3 domain at various pH. Figure 2 shows plots of $I(0)/c$ against pH. This shows $I(0)/c$ above pH 4 is nearly constant, and that below pH 2 is much less. As hNck2 SH3 domain takes dimer at pH 6 [2], the protein is mainly monomer at acidic pH, and dimer above pH 4. *Rg* values were shown in Fig. 3. Discussions will be developed in the next report [3].

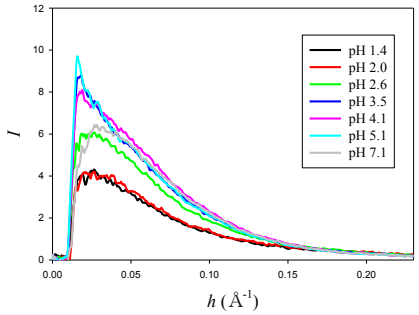

Fig. 1. Scattering patterns of hNck2 SH3 domain at various pH.

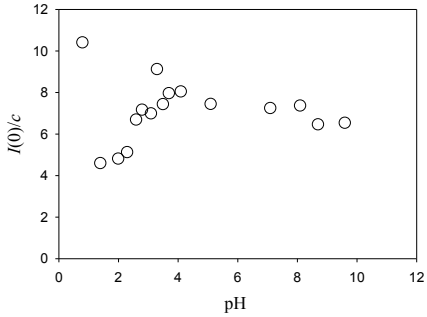

Fig. 2. $I(0)/c$ plots against pH.

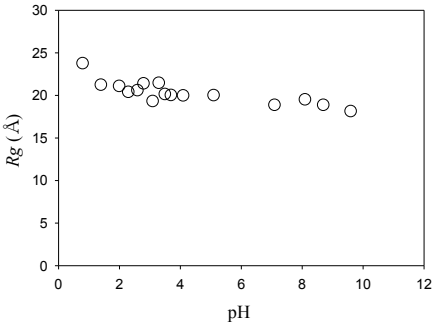

Fig. 3. *Rg* dependence of pH of hNck2 SH3 domain.

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References

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[2] Matsumura *et al*. (2012) This proceedings, I.
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