



Toward automated and optimized operations of hard x-ray diffraction experiments

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1. 背景と研究目的

The aspects of sample preparation is of great interest and tremendous influence for automating sample handling and studies at synchrotron sources. The Nagoya University BL2S1 beamline at the Aichi Synchrotron proposes a unique setup that gives structural biologists access to a large variety of experimental protocols, mostly due to its flexible and accommodating sample environment. One of the great advantages in working with such an end-station is the possibility to develop new methods, particularly focussing on sample handling and presentation to the x-ray beam. In order to gain further insights in on specific sample handling method consisting in Kapton-coated capillaries, screening of protein crystal buffers and eventually crystals has been initiated.

2. 実験内容

During the current shift, a Kapton-coated capillary was loaded on the beamline and tested in various conditions against its ease of use, compatibility with protein solutions and crystals, and for the resulting scattering background. classical crystallization condition of *hNeu2* has been characterized at BL2S1, under HPPX diffraction experiments. In practice, several capillaries were prepared, mounted and tested for diffuse scattering measurements. The quality of the scattering patterns was then assested, and conclusions provided for a potential use of such capillaries in the future.

3. 結果および考察

Kapton-coated capillaries were loaded with classical crystallization buffers for macromolecular crystals. Scattering images were then recorded without the capillaries aligned in the beam, with the empty capillary, with a capillary loaded with buffer only, and with a capillary loaded with small molecule crystals.

Interestingly, the background recorded from the loaded capillaries and visible on the scattering pictures Figure 1a. was not as high as originally suspected. More interesting, it seems that the size of these capillaries fits perfectly well with the beam diameter. The signal-over-noise ratio visible for the diffraction of small molecule crystals was very much satisfactory (Figure 1b).

4. 参考文献

None

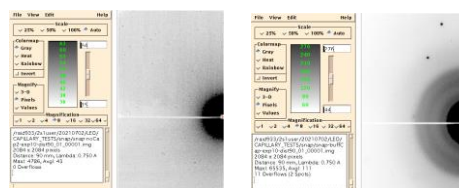


Fig. 1. Scattering pattern of (a) BL2S1 beamline without anything in the x-ray beam, and of (b) Kapton-coated capillaries loaded with buffer and small molecule crystals. The background goes from an averaged 43 to an averaged 111.