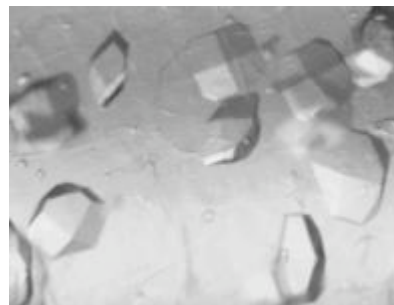


W0545

**Towards the Development of X-ray Transparent Devices for *in situ* Crystal Growth and X-ray Diffraction Data Collection.** Engel M.A.<sup>1,3</sup>, Soares A.S.<sup>2</sup>, Orville A.M.<sup>2</sup>, Allaire M.<sup>1</sup>,  
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With the advent of third generation synchrotron light sources such as NSLS-II and their potential to deliver intense microfocused x-ray beams, there is a dire need for improvements in high-throughput crystallographic data collection strategies. The development of an x-ray transparent device, which can be used for *in situ* crystal growth and diffraction, addresses this necessity. The benefit of such a tool would allow one to grow crystals and position them in an x-ray beam without separating crystals from their mother liquor. The use of such a device would permit one to potentially screen large numbers of samples very rapidly with minimal reagents.

Here, we present methods for growing thousands of crystals *in situ* using both the protein powder and microbatch techniques. Importantly, our prototypical devices are made primarily of x-ray transparent materials and can be mounted on standard goniometer heads. The engineering parameters include: 1) high levels of x-ray transparency 2) the use of materials that do not impede or alter crystal growth 3) sufficient sealing to prevent sample drying and 4) characteristics that allow for crystal centering and x-ray diffraction data collection. The figure shows crystals of lysozyme successfully grown in our x-ray transparent device. In the future, we plan to automate the *in situ* crystallization and data collection procedures and apply these methods to many soluble and membrane associated macromolecules.



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