Title: In Situ Serial Crystallography at Room Temperature

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Abstract: We recently reported a crystal-on-crystal device to facilitate in situ diffraction of protein crystals at room temperature devoid of any sample manipulation. We further developed an automated serial crystallography platform based on this crystal-on-crystal technology. We have implemented a hardware and software prototype, and established protocols that allow users to image, recognize, and rank hundreds to thousands of protein crystals grown on chip in an optical scanning mode prior to serial introduction of these crystals to an X-ray beam in a programmable and high-throughput manner. This serial data collection platform is compatible with both the monochromatic oscillation and Laue methods for X-ray diffraction and presents a widely applicable approach for static and dynamic crystallographic studies at room temperature.