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Radiation damage in a micron-sized protein crystal studied via reciprocal space mapping and Bragg coherent diffractive imaging

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For laboratory and synchrotron based X-ray sources, radiation damage has posed a significant barrier to obtaining high-resolution structural data from biological macromolecules. The problem is particularly acute for micron-sized crystals where the weaker signal often necessitates the use of higher intensity beams to obtain the relevant data. Here, we employ a combination of techniques, including Bragg coherent diffractive imaging to characterise the radiation induced damage in a micron-sized protein crystal over time using beam line 34-ID-C at the Advanced Photon Source. The approach we adopt here could help screen for potential protein crystal candidates for measurement at X-ray free electron laser sources.

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