

When Macromolecular Crystallography Meets high Pressure Techniques...

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Until recently, only two crystal structures of small proteins at high pressure below 200 MPa generated in a Be cell were published [1,2]. The lack of structural data at high pressure was due mainly to the cumulated complexities of high-pressure containment and crystallography. A technical breakthrough was achieved with a set-up at the ESRF ID30/ID27 beamline combining a diamond anvil cell, ultra-short wavelength (0.33 Å) X-rays from undulators and a large imaging plate [3]. The accessible pressure range was increased by nearly one order of magnitude. The quality of diffraction data collected under high pressure achieved usual standards.

We will present the technical advances as well as scientific results that we have obtained. In particular, scientific results will focus on the first crystal structure of a complex macromolecular assembly under high pressure, the Cowpea Mosaic Virus capsid at 330 MPa [4], demonstrating that high pressure macromolecular crystallography can now be considered as a mature and general technique.

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