Review of Dose Limits and Consequences for Protein Microcrystals

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Experience of collecting X-ray diffraction data from frozen protein crystals over the past few years has largely confimed the dose limits (predicted by Henderson, 1990 [1] and studied by Gonzalez and Nave, 1994 [2]) beyond which a degradation in the data quality occurs. A systematic study of the consequences for micro-crystals was carried out by Glaeser et. al., 2000 [3]. A brief review of this paper will be given.

[1] Henderson, R. 1990. Cryo-protection of protein crystals against radiation damage in electron and x-ray diffraction. Proc. R. Soc. Lond. Biol. 241:6-8.

[2] Gonzales, A., and C. Nave. 1994. Radiation damage in protein crystals at low temperature. Acta Crystallogr. D50:874-877.

[3] Glaeser, R., Facciotti, M., Walian, P., Rouhani, S., Holton, J., MacDowell, A., Celestre, R., Cambie, D., and Padmore, H. 2000. Characterization of Conditions Required for X-Ray Diffraction Experiments with Protein Microcrystals. Biophys J, 78: 3178-3185.