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| | **Experiment title: Herpesvirus Envelope Glycoprotein gD**<br>BAG - CNRS gif sur Yvette | **Experiment number**:<br>LS 1798 |
| **Beamline**:<br>ID14-EH1 | **Date of experiment**:<br>from: 08/02/01, 19.00 to: 09/02/01, 07.30 | **Date of report**:<br>27/02/01 |
| **Shifts:**<br>**1.5 (EH1)** | **Local contact(s)**:<br>Ed Mitchell | *Received at ESRF:* |

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**Report:** Herpesviruses possess a lipid envelope in which are anchored eleven different glycoproteins. Among them, glycoprotein gD is responsible for receptor recognition and binding, an important step which precedes fusion of the viral membrane with that of the target cell, leading to infection. gD is therefore indispensable to the viral cycle and indeed, some monoclonal antibodies to gD are known to neutralise HSV1 in cell culture. gD is a typical type I membrane protein of about 400 amino-acids with a large N-terminal ectodomain and a small C-terminal endodomain. Amino-acids 1-317 of gD from Herpes Simplex Virus 1 (HSV1) (containing two putative N-linked glycosylation sites) was cloned and expressed in CHO cells as a fusion protein with an Fc fragment from an antibody. In collaboration with E. A. Stura, we have obtained crystals of this fusion protein (gD-Fc). The crystals also contain an Fab produced from the cleavage of a rheumatoid factor (RF), that binds to the Fc part of the construct. Those crystals will therefore yield not only the structure of gD, but also that of this RF. This too will be of interest, as rheumatoid arthritis is an important human disease.
The crystals of gD-Fc:RF diffracted to 5 Å on EH1 under cryoconditions. We are working on growing better crystals (figure 1).

We are also working with an anti-gD antibody that neutralises HSV1 in cell culture. We have crystals of the Fab cleaved from this antibody. We collected a 1.9 Å dataset on EH1(spacegroup $P2_1$, completeness 99%, multiplicity 3.1, $R_{sym}$ 4.2%). The structure is now being refined.

**Figure 1: Crystals of RF:gD-Fc after Deglycosylation with NPGase F**