**Beamline CM01 Proposal MX-2002 CryoEM of a Voltage-Gated Sodium Channel**

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We (Sula, Booker) collected data for 3 days with the help of the beamline scientist (Eaazhisai Kandiah) on a novel voltage-gated ion channel, which had not previously been examined by any group using either cryoEM or crystallography. The sample was very difficult to purify in any significant quantities, which led us to use graphene-covered gold grids, a relatively new substrate for this beamline. The graphene substrate meant that the coverage of the grids with useful particles was relatively sparse, but we were able to identify sufficient grid areas for data collection, although about 10 hours the first night were lost in imaging an area with no particles as it was difficult to choose areas without exposing it to the beam. The relatively low MW of the protein (~250K) was also a challenge for data collection. Nevertheless we collected a useful data set of 3635 images, with 2671 good images, After applying motion correction, classification was done resulting in 60 000 starting particles. A homology model of the protein regions for which a sufficient template could be made (82%) as a search. We have been able to fit the classes into the model at low resolution, and this gives us an expectation that with more data, this project will be solvable.

We would especially like to thank the beamline scientist who was very helpful to us on this difficult project.