



**Experiment title:**  
**Gelsolin/actin complexes: Alwyn Jones BAG**

**Experiment number:**  
LS-2187

**Beamline:**  
ID29

**Date of experiment:**  
07-08 March 2003

**Date of report:**  
30/08/2004

**Shifts:**

**Local contact(s):**  
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**Names and affiliations of applicants (\* indicates experimentalists):**

**Robert Robinson, IMBIM, Uppsala University \***

## **Report:**

The special and temporal regulation of actin polymerization provides the force for cell locomotion. Gelsolin is an actin filament severing and capping protein that regulates the timing of actin polymerization through controlled capping or uncapping of filament ends. Gelsolin also contributes to regulating the total number of filaments through its severing function. Thymosin-beta 4 is an actin sequestering protein that provides a store of actin monomers which can participate in actin polymerization. This trip led to us to solve the structure of a hybrid protein consisting of the first domain of gelsolin fused to the C-terminal half of thymosin-beta 4 in complex with actin. This structure provided the first view of how a the C-terminal half of a WH2 domain protein binds to actin.

Irobi, E., Aguda, A. H., Larsson, M., Guerin, C., Yin, H. L., Burtnick, L. D., Blanchoin, L. & Robinson, R. C. Structural basis of actin sequestration by thymosin- $\beta$ 4: Implications for WH2 proteins. *EMBO J.* (2004) In press.

In a second experiment we attempted to remove calcium from crystals of the second half of gelsolin (G4-G6). We collected 2 data sets, one of which shows the loss of 1 of the 9 calcium-binding sites. We are currently refining this data.