

P008 Insights into the ancestral role of ESCRT proteins
**Rachel Y. Samson¹, Takayuki Obita², Olga Perisic²,
Roger L. Williams² and Stephen D. Bell¹**

1) Sir William Dunn School of Pathology, Oxford University

2) MRC LMB, Cambridge, UK

Members of the hyperthermophilic Crenarchaea family of the Archaeal domain of life encode homologues of eukaryotic ESCRT III components and the ATPase, Vps4. We have found that levels of the transcripts of these genes are up-regulated in dividing *Sulfolobus acidocaldarius* cells. In immunolocalisation studies, we find that ESCRT III and Vps4 localise to the septum during cell division. Further, we have demonstrated that conditional over-expression of a Walker B mutant of Vps4 acts as a *trans*-dominant negative and results in the generation of nucleoid-free cells and also grossly enlarged cells with multiple genome contents. We have mapped the interaction site between Vps4 and ESCRT III homologues and obtained the co-crystal structure of a complex of the MIT domain of archaeal Vps4 with a peptide corresponding to the minimal interaction site on archaeal ESCRT III.

Our data therefore indicate that the archaeal ESCRT system plays a pivotal role in the process of cell division in these prokaryotes. As similar properties have been ascribed to metazoan ESCRTs, we propose that this is reflective of an ancestral role for this system in cell division.