

**P021** Characterisation of a new respiratory supercomplex from the hyperthermophilic bacterium *Aquifex aeolicus*.  
**Prunetti, Laurence; Infossi, Pascale; Brugna, Myriam; Giudici-Ortoni, Marie-Thérèse and Guiral, Marianne.**  
*Laboratoire de Bioénergétique et Ingénierie des protéines*  
*31 chemin Joseph Aiguier, 13402 Marseille cedex 20*  
*France.*

*Aquifex aeolicus* is the most hyperthermophilic bacterium known to date. It grows at 85 °C under a H<sub>2</sub> / CO<sub>2</sub> / O<sub>2</sub> atmosphere, and only in the presence of a sulphur compound.

Some metalloenzymes involved in oxygen respiration were characterized as cytochrome *bc* complex, and two cytochromes *c*<sub>555</sub>. However, many features of energetic metabolism are not clear, particularly the oxygen respiration. No cytochrome *c* oxidase was characterized. Experiments realized on membranes revealed an electron transfer from H<sub>2</sub>S to O<sub>2</sub> via the Sulfide Quinone Reductase, a membrane-bound enzyme oxidizing H<sub>2</sub>S and the cytochrome *bc* complex.

Moreover, it was suggested that hydrogenase I, a membrane-bound enzyme, transfers electron from H<sub>2</sub> to O<sub>2</sub>. The electrons are probably transferred to the cytochrome *bc* complex and the cytochrome *c* oxidase to reduce oxygen from the hydrogenase I. We have associated tools of proteomics, biochemistry, and physicochemistry to characterize a complete respirasome of about 400 kDa involved in oxygen respiration. This superstructure contains all proteins and complexes, including an aa<sub>3</sub> cytochrome *c* oxidase, required for the electron transfer from electron donor to acceptor.