

Title: Exploration of the potential physiological functions of the SurR regulator at high pressures in *Thermococcus barophilus* MP.

SurR is a redox-active transcriptional effector, known to hold a master role in regulating numerous enzymes involved in the hydrogenogenic and sulfidogenic metabolism of *Thermococcales*, such as membrane and cytoplasmic hydrogenases. This order of heterotrophic, hyperthermophilic *Archaea* has representative often isolated at the vicinity of deep-sea hydrothermal vents, which can thus prefer to grow at high hydrostatic pressures (HHP). Among those piezophiles, *Thermococcus barophilus* typifies a model species, and grows optimally at 40 MPa. Thanks to the development of a genetic tool in our laboratory, several deletion mutants have been constructed, targeting the aforementioned enzymes, as well as SurR.

In order to further explore the role of SurR and other metabolic keystones in *T. barophilus*, this M2 project will, firstly, consist in realizing growth monitoring of the mutants at high and atmospheric pressures, in different sulfur growth conditions. This implies the use of specific HHP discontinuous incubators. Then, depending on the progress made, other mutants will be constructed, transcript expression patterns of the enzymes and regulator may be revealed by RT-qPCR, and functional physiology may be compared thanks to H₂/H₂S production quantitation by gas chromatography.

Altogether, those data should allow to clarify the precise roles of the SurR master regulator in the hydrogen and sulfur metabolisms of *T. barophilus*, and thus of *Thermococcales* in a wider manner.

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