**Appendix S2. TE-Power Probe model description**

The definition of *I* for maximal power acquisition, Eq. S1.4 in Appendix S1, was taken into account to define a simple thermal model, in which every thermal resistance of the TE-Power Probe is considered (Fig. S2). The equations modeling TE-Power Probe performance are:

 (S2.1)

 (S2.2)

 (S2.3)

 (S2.4)

 (S2.5)

 (S2.6)

Where *Vo* is the output voltage and *ΔTth* represents the difference in temperature between the hot and the cold side of the thermogenerator; *RCu* is the thermal resistance of the cupper bar connecting the broth (at a temperature *Tb*) and the hot side of the cell (at a temperature *TH*); and *RSk* is the thermal resistance found between the cold side of the thermogenerator (*TC*) and the environment (considering room temperature *Tenv*).

Under an open-circuit configuration the model equations can be written as follows:

 (S2.7)

 (S2.8)

 (S2.9)

 (S2.10)

Where there is no electrical power production.