

Table S1: Enzymatic rates at 25°C and Q₁₀ values for the identified triplet of psychrophilic, mesophilic and thermophilic enzymes reported in a single study.

| Enzyme | Psychrophilic | | | | Mesophilic | | | | Thermophilic | | | | Reference |
|--------------------------------|---------------------------------------|--------------------------------------------|--------------------------------------------------|-----------------|--------------------------------|--------------------------------------------|--------------------------------------------------|-----------------|---------------------------------|--------------------------------------------|--------------------------------------------------|-----------------|-----------|
| | organism | k _{cat} (s ⁻¹) (25°C) | Max k _{cat} (s ⁻¹) / T (°C) | Q ₁₀ | organism | k _{cat} (s ⁻¹) (25°C) | Max k _{cat} (s ⁻¹) / T (°C) | Q ₁₀ | organism | k _{cat} (s ⁻¹) (25°C) | Max k _{cat} (s ⁻¹) / T (°C) | Q ₁₀ | |
| DNA ligase | <i>Pseudoalteromonas haloplanktis</i> | 0.029 (20°C) | 0.033 / 18 | 2.35 | <i>Escherichia coli</i> | 0.0225 (30°C) | 0.027 / 40 | 2.45 | <i>Thermus scotoductus</i> | 0.006 (30 °C) | 0.025 / 53 | 1.81 | [10] |
| Lactate Dehydrogenases | <i>Champscephalus gunnari</i> | 898 | 1480 / 45 | 1.33 | <i>Deinococcus radiodurans</i> | 221 | 773 / 50 | 1.83 | <i>Thermus thermophilus</i> | 191 (65°C) | 829 / 90 | 1.77 | [11] |
| Enzyme | Psychrophilic | | | | Mesophilic | | | | Thermophilic | | | | Reference |
| organism | Relative activity (25°C) | Max activity / T (°C) | Q ₁₀ | organism | Relative activity (25°C) | Max activity / T (°C) | Q ₁₀ | organism | Relative activity (25°C) | Max activity / T (°C) | Q ₁₀ | | |
| Xylanase | <i>Pseudoalteromonas haloplanktis</i> | 94 | 100 / 30 | 1.27 | <i>Paenibacillus sp. D1</i> | 18 | 100 / 60 | 1.6 | <i>Clostridium thermocellum</i> | 12 (40°C) | 100 / 81 | 1.68 | [12] |
| Ornithine Carbamoyltransferase | <i>Moritella abyssi</i> | 100 | 100 / 21 | 2.1 | <i>Escherichia coli</i> | 24 | 100 / 60 | 1.5 | <i>Pyrococcus furiosus</i> | 5 (45°C) | 100 / 90 | 1.95 | [13] |

All data of this table were extracted from graphical representations.

10 Georgette, D., *et al.* (2003) Structural and Functional Adaptations to Extreme Temperatures in Psychrophilic, Mesophilic, and Thermophilic DNA Ligases. *Journal of Biological Chemistry* 278, 37015-37023

11 Coquelle, N., *et al.* (2007) Activity, Stability and Structural Studies of Lactate Dehydrogenases Adapted to Extreme Thermal Environments. *Journal of molecular biology* 374, 547-562

12 Collins, T., *et al.* (2003) Activity, stability and flexibility in glycosidases adapted to extreme thermal environments. *Journal of molecular biology* 328, 419-428

13 Xu, Y., *et al.* (2003) Metabolic Enzymes from Psychrophilic Bacteria: Challenge of Adaptation to Low Temperatures in Ornithine Carbamoyltransferase from *Moritella abyssi*. *Journal of bacteriology* 185, 2161-2168