

Fig. S1. Relative frequencies of the operative temperature of the limpet *Cellana toreuma* based on the data shown in Fig. 2, for each tidal level (A–F show 4.0. 3.5, 3.0, 2.0, 1.5 and 1.0 m above chart datum) investigated and the west-facing rocky surfaces.

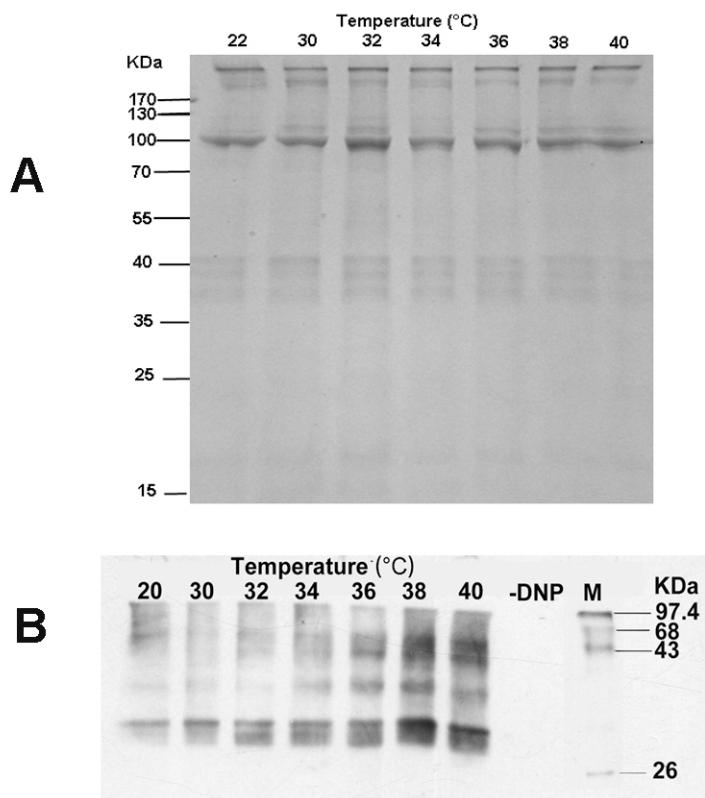


Fig. S2. Protein carbonyl groups derivatized with 2,4-dinitrophenylhydrazine (DNPH) and detected by (A) Coomassie Blue and (B) western blotting. The lane of ‘-DNP’ indicates that the sample was incubated with only 2.5 mol l⁻¹ HCl (no DNPH) as a negative control.

Table S1. Primers used for gene clone and real-time PCR amplification

Primer	Sequence	Objectives	Sources
SeaactinF	ACCGACTACYTSAKKAAGATCCT	partial <i>β-actin</i> sequence	Clark, 2008.
SeaactinR	GAVGCVAGGATGGAGCCRCC		
dAIHSP70F	CAGGAATTCAARCGYAAACAC	partial <i>hsp70</i> sequence	Song, 2006.
dAIHSP70R	TTGGTCATKGCTCGYTCTCC		
HSP90F1	GDGTGTTYATCATGGACAAYTGTGA	partial <i>hsp90</i> sequence	Gao, 2007.
HSP90R1	TTCATGATYCTYCCATGTTDGC		
AMPKαF	AACTCBAARCTHTTYMGWCA	partial <i>ampkα</i> sequence	Self-design
AMPKαR	GCATAR TT WGGNGADCCACA		
AMPKβF	GAYTTTGARGDTTSADGC	partial <i>ampkβ</i> sequence	Self-design
AMPKβR	GTNGCRCTDARHACCATKAC		
SIRT1F	GATCATGGT GCTGACCGGNGCNGGNT	partial <i>sirt1</i> sequence	Self-design
SIRT1R	CACCTGCTCCAGGGTGTCDATRTTYTG		
3R1HSP70	CCAAGCCGAATAACAAATC	3' sequence clone of <i>hsp70</i>	Self-design
3R2HSP70	CTGCTGCTGCCTTGGCTTAT		
5R1HSP70	TCTGTGGGTTCAACGCTA	5' sequence clone of <i>hsp70</i>	Self-design
5R2HSP70	TGTTTCCCTGGTCGTTGG		
3R1HSP90	GAAGATTGCCGAGTTGCT	3' sequence clone of <i>hsp90</i>	Self-design
3R2HSP90	AGTGAGAAAGCGAGGGTT		
5R1HSP90	CTCAGCAACTCGGCAATC	5' sequence clone of <i>hsp90</i>	Self-design
5R2HSP90	CAA CTCCATCGCCTTCTT		
3R1AMPKα	TGCATGATGGCGAGTTTT	3' sequence clone of <i>ampkα</i>	Self-design
3R2AMPKα	TTACCGCGCACCAAGT		
5R1AMPKα	AATTAGGTGAACCACAGC	5' sequence clone of <i>ampkα</i>	Self-design
5R2AMPKα	ATGCATCATGTTGACAGACCT		
3R1AMPKβ	GAGCCATCTTATTACCTG	3' clone sequence of <i>ampkβ</i>	Self-design
3R2AMPKβ	GTTGAATCATCTGTATGCCTTGT		
5R1AMPKβ	AAGGCATA CAGATGATT	5' sequence clone of <i>ampkβ</i>	Self-design
5R2AMPKβ	AGGTAAATAAGATGGCTC		
3R1SIRT1	CGACTT CCTAATCTACC	3' clone sequence of <i>sirt1</i>	Self-design
3R2SIRT1	TTCTGTATCTGTGGTATA		
qActinF	GAAGGATGGCTGGAACAA	Real-time primer for <i>β-actin</i>	Self-design
qActinR	CCGAGACATCAAGGAGAAG		
qAMPKαF	CGATTGTAGATGTAGATGTTGT	Real-time primer for <i>ampkα</i>	Self-design
qAMPKαR	GCCATTCTCTGATTGTCTAT		
qAMPKβF	AATGTGAATAGTGAACCGATA	Real-time primer for <i>ampkβ</i>	Self-design
qAMPKβR	AGCATAACAGCAGAACTC		
qHSP70F	AATATAAGGAAGAGGACGAGAG	Real-time primer for <i>hsp70</i>	Self-design
qHSP70R	TATCAGCCAGAGCATTAGC		
qSIRT1F	GCTGCTGATAAGGATGAG	Real-time primer for <i>sirt1</i>	Self-design
qSIRT1R	TACATTGGCTGGAAGAGA		
qHSP90F	ATGATCGGT CAGTTGGTGT	Real-time primer for <i>hsp90</i>	Self-design
qHSP90R	AGTTGGGTTGGTCAGGTGT		

q18S-F	GCGATAACCTTGATGTAT	Real-time primer for 18	Self-design
q18S-R	ACGAAATATTCTGGCTAC		
qBTUB-F	GAAGTTGATGAACAGATG	Real-time primer for β -tubulin	Self-design
qBTUB-R	AGATTCTTGAACAGTT		
qCAL-F	ACGGTAATGGTACAATAG	Real-time primer for calmodulin	Self-design
qCAL-R	TCATCTCATCTACTTCCT		

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4 References:

5 **Clark, M., Fraser, K. and Peck, L.** (2008) Antarctic marine molluscs do have an HSP70
6 heat shock response. *Cell Stress Chaperon.* **13**, 39-49.7 **Gao, Q., Song, L., Ni, D., Wu, L., Zhang, H. and Chang, Y.** (2007) cDNA cloning and
8 mRNA expression of heat shock protein 90 gene in the haemocytes of Zhikong
9 scallop *Chlamys farreri*. *Comp. Biochem. Physiol.* **147B**, 704-715.10 **Song, L., Wu, L., Ni, D., Chang, Y., Xu, W. and Xing, K.** (2006) The cDNA cloning and
11 mRNA expression of heat shock protein 70 gene in the haemocytes of bay scallop
12 (*Argopecten irradians*, Lamarck 1819) responding to bacteria challenge and
13 naphthalin stress. *Fish Shellfish Immun.* **21**, 335-345.