

**Table S1.** Gene-specific degenerate primers used to amplify and clone candidate genes involved in the ubiquitin-proteasome pathway of Antarctic and New Zealand notothenioids. Partial *Ub* sequences were obtained using primers outlined in Okubo et al. (2002). Partial sequences for *UbE2D1* were obtained using primers designed from conserved regions of *Danio rerio* (Accession No. NM\_199664), *Xenopus laevis* (Accession No. BC076728) and *Canis familiaris* (Accession No. XM\_845637). Partial sequences for *CHIP* were obtained using primers determined from conserved regions of *D. rerio* (Accession No. NM\_199674) and *Tetraodon nigroviridis* (Accession No. CR691698). Partial sequences for *PSMA2* were obtained using primers determined from conserved regions of *D. rerio* (Accession No. BC059539) and *Carassius auratus* (Accession No. AB013342). Partial sequence for *PSMB7* was obtained using primers determined from conserved regions of *D. rerio* (Accession No. NM\_001045564), *Gasterosteus aculeatus* (Accession No. BT028121) and *T. nigroviridis* (Accession No. CR718794). Partial sequences for *PSMC1* were obtained using primers designed from conserved regions of *D. rerio* (Accession No. NM\_200033), *G. aculeatus* (Accession No. BT027408) and *T. nigroviridis* (Accession No. CR650415). Partial sequences for  $\beta$ -Actin were obtained using primers determined from conserved regions of *Oryzias latipes* (Accession No. S74868), *D. rerio* (Accession No. AF057040), *Fundulus heteroclitus* (Accession No. AF397164) and *Pagrus major* (Accession No. AY190686). Partial sequences for *EF1 $\alpha$*  were obtained using primers outlined in Todgham et al. (2006).

Candidate gene	Primer sequences
<i>Ub</i>	Forward: 5'-CTG GAA GAT GGG CGA ACC C-3' Reverse: 5'-CTG CTT GCC AGC AAA GAT CAA CC-3'
<i>UbE2D1</i>	Forward: 5'-TTR TTY CAC TGG CAA GCA AC-3' Reverse: 5'-TTC TGR GTC CAT TCT CTT GC-3'
<i>CHIP</i>	Forward: 5'-GSA TCM RCC ARG AGA RCG AG-3' Reverse: 5'-ATR AAD GCR TCR ATM ACC TC-3'
<i>PSMA2</i>	Forward: 5'-GTT GTG CTG GCA ACW GAG AA-3' Reverse: 5'-GCG AAA YCC TGC TTC ATT AC-3'
<i>PSMB7</i>	Forward: 5'-TCC AAC CTG GAG CTK CAY KC-3' Reverse: 5'-GST YTC CTC CAC CAY MTC CA-3'
<i>PSMC1</i>	Forward: 5'-CCC ATG TCT GTS GGM ACT CT-3' Reverse: 5'-GAT CTC VCG CTC WCC KCC WG-3'
$\beta$ -Actin	Forward: 5'-CAA CGG MTC YGG TAT GTG CAA AG-3' Reverse: 5'-TGG CRT GGG GMA GRG CRT ARC C-3'
<i>EF1<math>\alpha</math></i>	Forward: 5'-GAA GGA AGC HGC TGA GAT GG-3' Reverse: 5'-CGG TCT GCC TCA TGT CAC GC-3'

**Table S2.** Gene-specific quantitative RT-PCR primers used to amplify candidate genes involved in the ubiquitin-proteasome pathway of Antarctic and New Zealand notothenioids.

Candidate gene	Primer sequences
<i>Ub</i>	Forward 5'-GGA AAG ACC ATC ACC CTA GAG GTA-3' Reverse 5'-TGG ATC TTG GCC TTC ACG TT-3'
<i>UbE2D1</i>	Forward 5'-GGA CCG AAT GAC AGC CCT TA-3' Reverse 5'-TCA GTG GGA AAA TGG ACA GAA A-3'
<i>CHIP</i>	Forward 5'-CTT ATG ATC GCA AGG ACA TTG AAG-3' Reverse 5'-GGT GAC CGG GTC GAA GTG-3'
<i>PSMA2</i>	Forward 5'-CGA CGA GCC CGG AAG TT-3' Reverse 5'-GGG ATG GGC TCC TGG TAA A-3'
<i>PSMB7</i>	Forward 5'-CAC GAG GAG GCC AAC AAG AA-3' Reverse 5'-CAC GCC TGT GGT TCC TCT CT-3'
<i>PSMC1</i>	Forward 5'-TGA TCC CCT GGT GAC AGT GA-3' Reverse 5'-CGA TGT CAG CGT AGG TTT CTT G-3'
$\beta$ -Actin	Forward 5'-AGT ACC CCA TTG AGC ACG GTA TT-3' Reverse 5'-AAG GTG TGA TGC CAG ATC TTC TC-3'
<i>EF1<math>\alpha</math></i>	Forward 5'-TGA CTG CGC TGT GCT GAT C-3' Reverse 5'-CTT GGA GAT ACC GGC CTC AA-3'

References:

**Okubo, K., Yamano, K., Qin, Q., Aoyagi, K., Ototake, M., Nakanishi, T., Fukuda, H. and Dijkstra, J. M.** (2002) Ubiquitin genes in rainbow trout (*Oncorhynchus mykiss*). *Fish Shellfish Immunol.* **12**, 335-351.

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