

**Figure S1.** 3D molecular model of the transmembrane helix of *T. bernacchii* pIgR built with the Phyre2 tool (<http://www.sbg.bio.ic.ac.uk/phyre/html/>). The cysteine residue, located in the middle of the sequence with its side chain pointing out of the transmembrane helix, is shown. The N- and C-termini are indicated at the top and bottom, respectively.

**Signal peptide**

*Trematomus bernacchii* MLKPFLLTLSLLPWIPV

*Trematomus loennbergii* V

*Dissostichus eleginoides* PWIPA

*Dissostichus mawsoni*

*Notothenia coriiceps* LPWIPV

*Harpagifer antarticus* V

*Gymnodraco acuticeps* MLKPFLLTLSLLPWIPV

*Pseudochaennichthys georgianus* MLKPFLLTLSLLPWIPV

*Chionodraco myersi* V

*Chaenocephalus aceratus* V

*Chionodraco hamatus* SLLPWIPV

*Cottoperca gobio* MLQPFILALSLLPWIPA

*Sander lucioperca* MLQPFIITLSLLPWFPA

*Perca fluviatilis* MLQPFLIVLSLLPWFPA

*Perca flavescens* MLQPFIITLSLLPWFPA

*Etheostoma spectabile* MLPPFIIALSLFPFFPA

*Etheostoma cragini* MLQPFTITLSLLPFFPA

*Epinephelus coioides*  MRRLFILTLSLLPWIPA

*Epinephelus lanceolatus* MRRLFILTLSLLPWIPA

*Plectropomus leopardus*

*Sebastes umbrosus* MLQPFILALILLPWIPA

*Pungitius pungitius* MRKLFTLALTLFPWISG

*Anarrhichthys ocellatus* MQQPFILALSLLSWIPA

*Cyclopterus lumpus* MLRPFLLALSLLPWIPA

*Liparis tanakae*

*Gasterosteus aculeatus* MRKLFTLALTLLSWIPG

 **/D1 L S S**

*Trematomus bernacchii* FLCGT-TTEEELSIMEGQSLTVPCHYEPQYASYVKYWCRGTMREFCSSLA

*Trematomus loennbergii* FLCGT-TTEEELSIMEGQSLTVPCHYEPQYASYVKYWCRGTMREFCSSLA

*Dissostichus eleginoides* FLCGT-PTEGELSVMEGQSLTVPCHYEPQYASYVKYWCRGKMREFCSSLA

*Dissostichus mawsoni* FLCGT-TTEEELSVMEGESLTVPCHYEPQYASYIKYWCRGKMREFCSSLG

*Notothenia coriiceps* FLCGT-TTEEELSVMEGQSLTVPCHYEPQYASYVKYWCRGTMREFCSSLA

*Harpagifer antarcticus* FLCGT-TTEEELSVMEGQSLTIPCHYEPQYASYIKYWCRGKMREFCSSLA

*Gymnodraco acuticeps* FLCGT-TTEEELSVMEGQSLTVPCHYEPQYASYIKYWCRGKMREFCSSLA

*Pseudochaennichthys georgianus* FLCGT-TTEEELSVMEGESLTVPCHYEPQYASYIKYWCRGKMREFCSSLA

*Chionodraco myersi* FLCGT-TTEEELSVMEGESLTVPCHYEPQYASYIKYWCRGKMREFCSSLA

*Chaenocephalus aceratus* FLCGT-TTEEELSVMEGESLTVPCHYEPQYASYIKYWCRGKTREFCSSLA

*Chionodraco hamatus* FLCGT-TTEEELSVMEGESLTVPCHYEPQYASYIKYWCRGKMREFCSSLA

*Cottoperca gobio* LLCST---EGELSVLEGQSLTVPCHYEPQYASYVKYWCRGKTKEFCSSLA

*Sander lucioperca* FLCRV-TTEGEHAVMEGQPLTVPCHYGPQYAGYVKYWCRGKMREFCTSLA

*Perca fluviatilis* FLCRV-TTEGEHAVMEGQPLTVPCHYGPQYAGYVKYWCQGKMREFCTSLA

*Perca flavescens* FLCRV-TTEGEHAVMEGQPLTVPCHYGPQYAGYVKYGCRGKMREFCTSLA

*Etheostoma spectabile* FHCGV-TTEGEHTVMEGQHLTVPCHYGPQYAGYVKYWCRGKMREFCSSLA

*Etheostoma cragini* FLCGV-TTEGEHAVMEGQHLTVPCHYGPQYAGYVKYWCRGKMREFCTSLA

*Epinephelus coioides* VLCKV-TTEGELSIMEGQSLTIPCHYEPQYASYVKYWCQGKTREFCTSLA

*Epinephelus lanceolatus* VICKV-TTEGELSIMEGQSLTIPCHYEPQYASYVKYWCQGKTREFCTSLA

*Plectropomus leopardus* FLCGT-TTEEELSIMEGQSLTVPCHYEPQYASYVKYWCRGKMKEFCTSLA

*Sebastes umbrosus* FHCRV-TTEGDIAVMEGQSLTVPCIYEPQHASYVKYWCRGKMKAFCTTLA

*Pungitius pungitius* FLCQPAFTGGELSVMEGQSLTVPCHYESQYAGHVKYWCRGKVRGFCTSLA

*Anarrhichthys ocellatus* FLCRV-TTEGELTVMEGQSLIVPCHYDPQYAGYVKYWCRGNTREFCTSLA

*Cyclopterus lumpus* FLCRV-TTEGELAVMEGQSLTVPCHYDPQYAGYVKYWCRGKMREFCTSLA

*Liparis tanakae* MDPRV-TTDAELAVMEGRSLTVPCHYDPQYAGYLKYWCRGKMREFCTSLA

*Gasterosteus aculeatus* FL-----SEAELSVMEGQSLTVPCHYEPQYAGYVKYWCRGKMRGFCTSLA

 L

*Trematomus bernacchii* RTDESHSTNPSE-KKVRLFDDPVQQVFTVAMSNLREEDSGWYMCGVEIGG

*Trematomus loennbergii* RTDESHSA**NLS**E-KKVRLFDDPVQQVFTVAMSNLREEDSGWYMCGVEIGG

*Dissostichus eleginoides* RTDESHSA**NLS**E-KKVRLFDDPVQQVFTVAMSNLREEDSGWYMCGVEIGG

*Dissostichus mawsoni* RTDESHSA**NLS**E-KKVRLFDDPVQQVFTVAMSNLREEDSGWYMCGVEIGG

*Notothenia coriiceps* QTDESHSANPSE-KKVRLFDDPVQQVFTVAMSNLGEEDSGWYMCGVEIGG

*Harpagifer antarcticus* RTDESHSANPSE-KKVRLFDDPVQQLFTVAMSNLREEDSGWYMCGVEIGG

*Gymnodraco acuticeps*  RTDESHSANPSE-KKVRLFDDPVQQVFTVAISNLMEEDSGWYMCGVEIGG

*Pseudochaennichthys georgianus* RTDESHSVNPSE-KKVRLFDDPVQQVFTVAMSNLREEDSGWYICGVEIGG

*Chionodraco myersi* RTDESHSVNPSE-KKVRLFDDPVQHVFTVAMSNLREEDSGWYMCGVEIGG

*Chaenocephalus aceratus* RTDESHSVNPSE-KKVRLFDDPVQQVFTVAMNNLREEDSGWYMCGVEIGG

*Chionodraco hamatus* RTDESHSVNPSE-KKVRLFDDPVQQVFTVAMSNLREEDSGWYMCGVEIGG

*Cottoperca gobio* RTDVTRSANTAE-EKVGIFDDPVQLVFTVTMSNLREEDSGWYMCGVEIGG

*Sander lucioperca* RTDEPRSANQAE-EKVSIFDDPVQLVFAVTMSNLKEGDSGWYMCGVEIGG

*Perca fluviatilis* RTDEPRSANPAE-EKVSIFDDPVQLVFTVTMSNLKEGDSGWYMCGVEIGG

*Perca flavescens* RTDEPRSANPAE-EKVSIFDDPVQLVFTVTMSNLKEGDSGWYMCGVEIGG

*Etheostoma spectabile* RTDEPRSANPAE-EEVSIFDDPVQLVFTVTMSNLKEGDSGWYMCGVEIGG

*Etheostoma cragini* RTDEPHSANSAE-EKVSIFDDPVQLVFTVTMSNLKEGDSGWYMCAVEIGG

*Epinephelus coioides* RTDEPRSADPAE-KKVSIFDDQVQLVFTVTMNNLKEGDSGWYMCGVEIGG

*Epinephelus lanceolatus* RTDEPRSADPAE-KKVSVFDDQVQLVFTVTMNNLKEGDSGWYMCGVEIGG

*Plectropomus leopardus* RTDEPPSADSAK-KKVSIFDDQVQLVFTVTMNDLKEGDSGWYMCGVEIGG

*Sebastes umbrosus* RTDETRSADPAEEKKVSIFDDPVQLVFTVTMNNLKEDDSGWYMCGVEIEG

*Pungitius pungitius* RTDP----AIAAAGKVSISDDRVQLVFTVTMSDLKEGDSGWYLCGVEIGG

*Anarrhichthys ocellatus* RTDS----ANPAAGKVSIFDDPVQQVFTLTMSDLKEGDSGWYMCGVEIGG

*Cyclopterus lumpus* RTDP----AHPAARKVSIFDDPVQQVFTVTMGDLKETDSGWYMCGVEVGG

*Liparis tanakae* RTDP----ATPAVKTVSLLDDPVQQVFTVTMDDLKEADSGWYICGVEVGG

*Gasterosteus aculeatus* RTDT----ANPAAGKVSMSDDPVQLVSTVTMSDLKEGDSGWYICGVELGG

 **/ /D2 L**

*Trematomus bernacchii* LWSADVVTHKNINVIHGMTVEDRRLSGEEGSSVTVECQYSERYRESEKKW

*Trematomus loennbergii* LWSADVVTHKNINVIHG KKW

*Dissostichus eleginoides* VWSADVVTYKNINVIHGMTVENSRLSGEEGSSITVECQYSERYRESEKKW

*Dissostichus mawsoni* LWSADVVTHKNINVIHGMTVENSRLSGEEGSSVTVECQYSERYRESEKKW

*Notothenia coriiceps* LWSADVVTHKNIKVIHGMTVENSRLSGEEGSSVTVECQYSERYRESEKKW

*Harpagifer antarcticus* LWSADVVIYKHIKVIHG KKW

*Gymnodraco acuticeps* LWSADVVTHKNIKVIHGMTVENSRLNEEEGSSVTVECQYSERYRESEKKW

*Pseudochaennichthys georgianus* LWSADVVTYKNIKVIHGMTVENSRLSGEEGGSVTVECQYSERYRESEKKW

*Chionodraco myersi* LWSADVVTYKNIKVIHG KKW

*Chaenocephalus aceratus* LWSADVVTYKNIKVIHG KKW

*Chionodraco hamatus* LWSADVVTYKNIKVIHGMTVENSRLSGEEGSSVTVECQYSERYRESEKKW

*Cottoperca gobio* VWSADVVTYTNIRVIHGLTVVNSRLSGGEGSSVTVECHYSERFRESEKKW

*Sander lucioperca* AWSADDVAYTNIKVIHGMSVVNSRLIGEEGSSITVECHYSERYRESEKKW

*Perca fluviatilis* AWSADDVAYTNIKVIHGMSVVNSRLIGEEGSSITVECHYSERYRESEKKW

*Perca flavescens* AWSADDVAYTNIKVIHGMSVVNSRLIGEEGSSITVECQYSERYRESEKKW

*Etheostoma spectabile* MWTADDVAYTNIKVIHGMSVVNSFLIGEEGSSITVECHYSERCRESEKRW

*Etheostoma cragini* IWSADDVAYTYIKVIHGMSVVNSFLIGEEGSSLTVECHYSERCRESEKRW

*Epinephelus coioides* VWSADDVAFTNIKVIHGMSVVNSRVSGEEGSSLTVECHYSERYRESEKKW

*Epinephelus lanceolatus* VWSADDVAFTNIKVIHGMSVVNSRVSGEEGSSLTVECHYSERYRESEKKW

*Plectropomus leopardus* VWHSDDVAFTNIKVIHG KKW

*Sebastes umbrosus* VWHSDDVAFTYISVIHGMSVVNSRLSGEEGSSVTVEC**NYS**ERYRESEKKW

*Pungitius pungitius* AWTADVVTQTYINVIHGMSVVNSRLSGEEGSSVTVECHYSEKYRDSEKKW

*Anarrhichthys ocellatus* VWTRDVVASTYIKVIHGMSVVNSRLSGEEGSSVTVECRYSERYRDSEKKW

*Cyclopterus lumpus* VWTADVVAYTYIKVVHGMSVVNSRLSGEEGSSVTVECHYSERYRDSEKKW

*Liparis tanakae* GWTPDVVAHTYIKVVH

*Gasterosteus aculeatus* AWTADAVTETYIQVIHGMSVVNSRLSGEEGSSVTVECHYSERYRDSQKKW

 **S S L**

*Trematomus\_bernacchii* CRSGDSSSCLLAGSEGSNG**NSS**VDIKDDRSGSFTITFKKLQMRDTGWYWC

*Trematomus loennbergii*  CRSGDSSSCLLAGSEGSNE**NSS**VDIKDDRSGSFTITFKKLQMRDTGWYWC

*Dissostichus eleginoides* CRSGDWSSCLLAGSEGSNEDSSVDIKDDRSGSFTITFKKLQMRDTGWYWC

*Dissostichus mawsoni* CRSGDWSSCLLAGSEESNEDSSVDIEDDRSGSFTITFKKLQMRDTGWYWC

*Notothenia coriiceps* CRSGNWSSCLLAGSEGS**N-DS**SVDIKDDRSGSFTITFKKLQMRDTGWYWC

*Harpagifer antarcticus* CRSGDWSSCLLAGSEGS**N-DS**SVYIKDDRSGSFTITLKKLQMRDTGWYWC

*Gymnodraco acuticeps* CRSGDWSSCLLAGSEGS**N-DS**SVYIKDDRSGSFTITFKKLQMRDTGWYWC

*Pseudochaennichthys georgianus* CRSGDWSSCLLAGSEGS**N-DS**SVYIKDDRSGSFTITFKKLQMRDTGWYWC

*Chionodraco myersi* CRSGDWSSCLLAGSEGS**N-DS**SVYIKDDRSGSFTITFKKLQMRDTGWYWC

*Chaenocephalus aceratus* CRSGDSSSCLLAGSEGSNG**NSS**VDIKDDRSGSFTITFKKLQMRDTGWYWC

*Chionodraco hamatus* CRSGDWSSCLLAGSEGS**N-DS**SVYIKDDRSGSFTITFKKLQMRDTGWYWC

*Cottoperca gobio* CRSGDWSSCLSTGSEGSYDDTSVAISDDRTRTFTVTLKKLQMRNTGWYWC

*Sander lucioperca* CRSGDWSSCLLTGSDGSYEDTSVAISDDRTRTLTITLKKLQMRDTGWYWC

*Perca fluviatilis* CRSGDWSSCLLTGSDGSYEDTSVAISDDRTRTFTITLKKLQMRDTGWYWC

*Perca flavescens* CRSGDWSSCLLTGSDRSYEDTSVAISDDRTRTFTITLKKLKMRDTGWYWC

*Etheostoma spectabile* CRSGDWSSCLLTDSDGRYEDTSVAISDDRTRTLTITLKKLQMRDTGWYLC

*Etheostoma cragini* CRSGDWSSCLPTGSDGRYEDTSVAISDDRTRTLTITLKKLQMRDTGWYLC

*Epinephelus coioides* CRSGDWSSCLLTGSEGSYEDTSVAISDDRTRTFTITLKKLQMRDAGWYWC

*Epinephelus lanceolatus* CRSGDWSSCLLTGSEGNYEDTSVAISDDRTRTFTITLKKLQMRDTGWYWC

*Plectropomus leopardus* CRSGDWSSCLLIDSEGSYEDTSVAISDDRTRTFTVTLKKLQMRDTGWYWC

*Sebastes umbrosus* CRSGDWSSCLLTGSEGSYEDTSVAIRDDRTRTFTITLKKLQMRDNGWYWC

*Pungitius pungitius* CRIGDWSSCLLTGSEGSYDDTSVAIRDDRTRTFTVTLKKLQMKDTGWYWC

*Anarrhichthys ocellatus* CRSGDWSSCLLTGSEGSYEDTSVAISDDRTRAFTVTLKKLQMSDSGWYWC

*Cyclopterus lumpus* CRSGDWSSCLLTGSEGSYEDTSVALRDDRTRTFTITLKKLRMRDSGWHWC

*Liparis tanakae*

*Gasterosteus aculeatus* CRTGDWSSCLLTGSEGSY**NDT**SVAIRDDGSRTFTVTLKNLQMKDTGWYWC

 **/EMPD**

*Trematomus bernacchii* SAGLQKMPVHVQVVPRPMTT-VS---VTTQPQTVANPLPPKPITKESWNG

*Trematomus loennbergii* SAGLQKMPVHVQVVPRPM

*Dissostichus eleginoides* SAGLQKMPVHVQVKPRPMTTAVS---VTSQPQT-ANPLPPKPITKESWSG

*Dissostichus mawsoni* SAGIQKMPVHVQYILLS---------VCDIPTSDCKSSSPKPITKESWSG

*Notothenia coriiceps* SAGLQKMPVHVQVKPRPMTT-VS---VTSQPQTV PKPITKESWSG

*Harpagifer antarcticus* SAGLQKMPVHVQVKPRPM

*Gymnodraco acuticeps* SAGLQKMPVHVQVKPRPMTMS-----VTSQPQTVANPPPPKPITKESWSG

*Pseudochaennichthys georgianus* SAGLQKMPVHVQVKPRPMTT-VS---VTSQPQTVANPLPPKPITKESWSG

*Chionodraco myersi* SAGLQKMPVHVQVKPRPM

*Chaenocephalus aceratus* SAGLQKMPVHVQVKPRPM

*Chionodraco hamatus* SAGLQKMPVHVQVKPRPMTT-VS---VTSQPQTVANPLPPKPITKESWSG

*Cottoperca gobio* SAGQQKMPVHVQVTPRP-TTTVS---VTSPPQSIAYLPPPKPITKESGNN

*Sander lucioperca* SAGQQQIAVHVLVTPRP-TTAVSVTSTPTTSQSVAYLPPPKPITKESWNS

*Perca fluviatilis* SAGQQQIAVHVLVTPRPTTAAVSVTSTPKTSQSVAYLPPPKPITKESWNS

*Perca flavescens* SAGQQQIAVHVLVTSRPTT--VSVTSTPTTSQSVAYLPPPKPITKESWNS

*Etheostoma spectabile* FAGRQQKDVHVLVTPRP-TTIASVTSTPTASQSVAYLPAPKPISKESWKS

*Etheostoma cragini* FAGRQKKDVHVLVTPRP-TTIASVTSTPTTSQSVAHLPAPKPISKESWNR

*Epinephelus coioides* SAGQQQMAVHVLVTRRATTTVVSVTSPPTRLHSAAYLPPPKPITKESWNS

*Epinephelus lanceolatus* SAGQQQMPVHVLVTRRATTT-VSVTSPLTHLHSAAYLPPPKPITKESWNS

*Plectropomus leopardus* SAGQQQMAVHVLVTPRP R

*Sebastes umbrosus* SAGQQQVSVHVQVTPRPTTT-VS---VTSPPTRSRVLAYLPPPKPITKES

*Pungitius pungitius*  CAGQHQMHVHVIVTPRLWTTAVTATSPPTQSQALAHLPPSEPITKDSWRS

*Anarrhichthys ocellatus* SAGQHQKLVYVLVTPTPTTTAVTATSPLTPSQSAAYLPPPKPITKESWNS

*Cyclopterus lumpus* SVGAQADAACMCWSPPRPTT-----SRLTPSRSVALLAAPEPITEESRKQ

*Liparis tanakae*

*Gasterosteus aculeatus* CAGQHKEHVHVIVTPRPSTTAVTVTSRPTASLSLAYLPPPKPITKESCNS

 **/ Transmembrane /Cyt**

*Trematomus bernacchii* H**NFS**RILGSLLVCGSVIL-VGLAILARKWWKRH-------MQDPMLRQLNG

*Tremantomus loennbergii* SFSHILGSLLVCGSVIL-VGLAIVARKWWKRH QDPVLRQLNG

*Dissostichus eleginoides* H**NFS**HVLGSLLVCGSVIL-VGLAIVARKWWRHS-PEYPFLEQDPVLRQLDG

*Dissostichus mawsoni* HN--HVLGSLLVCGSVIL-VGLAIVARKWWKRHNPEYPFLEQDPVLRQLNG

*Notothenia coriiceps* H**NFS**HVLGSLLVCGSVIL-VGLA ARKWWKRH--------KDPVLRQLNG

*Harpagifer antarcticus* SFSHVLGSLLVCGSVIL-VGLAIVARKWWKRH------LE-DPVLRQLNG

*Gymnodraco acuticeps* H**NFS**HVLGSLLVCGSVIL-VGLAIVARKWWKRQ--------KDPVLRQLNG

*Pseudochaennichthys georgianus* H**NFS**HVLGSLLVCGSVIL-VGLAIVARKWWKRH--------KDPVLRQLNG

*Chionodraco myersi* SFSHVLGSLLVCGSVIL-VGLAIVARKWWKRH LE-DPVLRQLNG

*Chaenocephalus aceratus* FSHVLGSLLVCGSVIL-VGLAIVVRKWWKRH LE-DPVLRQLNG

*Chionodraco hamatus* H**NFS**HVLGSLLVCGSVIL-VGLAIVARKWWKRH------- KDPVLRQLNG

*Cottoperca gobio* HS--HILWSLLVCASVMLLLGLAILARKLWKKHK-------QDPVLRQLKE

*Sander lucioperca* HS--HILESLLVCASIMLLVGMAILARKLWKQHK-------QDPVLRQVKE

*Perca fluviatilis* HS--HILESLLVCASIMLLVGLVILARKLWKQHK-------QDPVLRQVKE

*Perca flavescens* HS--HILESLVVCASIMLLVGLLILARKLWKQHK-------QDPVLRQVKE

*Etheostoma spectabile* HS--HILESMLVCASIMILVGLAILARKLWIQQIH-----EQDPVLRPVKE

*Etheostoma cragini* HN--HILESMLVCATVMLLVGLAILARKLWIQQIQ-----EQDPVLRPVKE

*Epinephelus coioides* HS--HILESLLVCASIMLLVGLAILARKLWKQHK-------QDPLQRQLKA

*Epinephelus lanceolatus* HS--HILESLLVCASIMLLVGLAILARKLWKQHK-------QDPLQRQVKA

*Plectropomus leopardus* FS--HILESLLVCASIMLLVGLAILVRKLWKQH

*Sebastes umbrosus* S-HSLILESLLVCASVMLLVGLAILARKWWKQHK-------RDPVLRQVKA

*Pungitius pungitius* HR--HIMESFLVCASFLFLVGLAILVRKLWKRHR-------QDPLLRQVQM

*Anarrhichthys ocellatus* HS--HILETLLVCAFIMFIVGLAIWVRKLWRRHG-------QDPVLRQVNM

*Cyclopterus lumpus* H----ILESLLVCASIMFLVGMAILARKLWKQHRR-------DPVLRQVNR

*Liparis tanakae*

*Gasterosteus aculeatus* HS--HIMESFLVCASFLILLGLAILVRKLWKRHR-------QDPMLRQVKM

*Trematomus bernacchii* MNARRNEYS-DVGCDLQ**NAT**VVFVNKDSQDVHMY

*Trematomus loennbergii* MNARRNEYS-NVGCDLQNAAVVFVNKDSQDVHMY

*Dissostichus eleginoides* MNARRNQYS-DVGCDEQNAAVVFLNKDSQDVHMY

*Dissostichus mawsoni* MNARRNEYS-DVGCDLQNAAVVFLNKDSQDVHMY

*Notothenia coriiceps* MNARRNEYS-DVGCDLQ**NAT**VVFLNKDFQDVHMC

*Harpagifer antarcticus* MNARRNEYS-DVGCDLQ**NAT**VVFRNKDSQHVHM

*Gymnodraco acuticeps* MNARRNEYS-DVGCDLQ**NAT**VVFLNKDSQDVHMC

*Pseudochaennichthys georgianus* MNARRNEYS-DVSCDLQ**NAT**VVFLNKDSQDVHMC

*Chionodraco myersi* MNARRNEYS-DVSCDLQ**NAT**VVFLNKDSQDVHMC

*Chaenocephalus aceratus* MNARRNEYS-DVSCDLQ**NAT**VVFLNKDSQHVHM

*Chionodraco hamatus* MNARRNEYS-DVSCDLQ**NAT**VVFLNKDSQDVHMC

*Cottoperca gobio* IKARHNEYSGDVG-DQQSTAVIFLNRDSQDIHMY

*Sander lucioperca* IQARHNEYSG----DLQNSAVVFLNRDSQDVQMY

*Perca fluviatilis* IQARHNEYSG----DLQNSAVVFLNRDSQDVRIY

*Perca flavescens* IQARHNEYSG----DLQNSAVVFLNRDSQDVHMY

*Etheostema spectabile* I

*Etheostema cragini* I

*Epinephelus coioides* IKARHNEYSGDVG-DLQNAAVVFLNRDSQDVHMY

*Epinephelus lanceolatus* IKARHNEYSGDVG-DLQNTAVVFLNRDSQDVHMY

*Plectropomus leopardus*

*Sebastes umbrosus* IKAKHNEYSGDSD-DPQNAAVVFLKRDSQGVYIH

*Pungitius pungitius* IKARHNEYSGDVG-DPQSAAVVFLNRDCEDAHMH

*Anarrhichthys ocellatus* IKARHNGYSGDVG-DPQSAAVVSQEY

*Cyclopterus lumpus* IKARHNEFSGDVD-DPQSTGVVFLNVDSQDVHMY

*Liparis tanakae*

*Gasterosteus aculeatus* IKARHNEGSGDVG-DPQSAAVVFLNRDCQEAYMH

**Figure S2.** Multiple alignment of the deduced amino acid sequences ofpIgRs available from Notothenioidei (Antarctic species in blue; non-Antarctic species in light blue) and from representative species of the perciform suborders Percoidei (in brown), Serranoidei (in red), Scorpaenoidei (in purple), and Cottoidei (in green). Notothenioid specific residues are highlighted in magenta. Putative N-glycosylation sites are reported in bold and underlined. Gaps are indicated by dashes.



**Figure S3.** Detail of R60, K103, E114, and N161 residues in the 3D molecular model built for the secretory componentof *T. bernacchii* pIgR. For each residue, the side chain exposed to the solvent is shown.

**Table S1**. Amino acid composition of *T. bernacchii* pIgR and the respective regions SC (Secretory Component), EMPD (Extra-cellular proximal domain), TM (Transmembrane domain), Cyt (Cytoplasmic tail).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | pIgR |  SC | EMPD | TM | Cyt |
| **Percentage of amino acid residues** | Ala (A): 3.8%Arg (R): 5.6%Asn (N): 4.1%Asp (D): 4.7%Cys (C): 3.3%Gln (Q): 4.1%Glu (E): 6.2%Gly (G): 6.8%His (H): 2.4%Ile (I): 3.3%**Leu (L): 8.3%**Lys (K): 4.7%Met (M): 3.8%Phe (F): 2.7%Pro (P): 4.7%**Ser (S):10.7%**Thr (T): 5.9%Trp (W): 3.0%Tyr (Y): 3.0%**Val (V): 8.9%** | Ala (A): 3.7%Arg (R): 5.7%Asn (N): 3.7%Asp (D): 4.5%Cys (C): 3.3%Gln (Q): 4.1%**Glu (E): 8.2%**Gly (G): 6.9%His (H): 2.4%Ile (I): 2.9%Leu (L): 4.9%Lys (K): 4.9%Met (M): 3.3%Phe (F): 2.4%Pro (P): 4.9%**Ser (S):12.7%**Thr (T): 6.9%Trp (W): 2.9%Tyr (Y): 3.3%**Val (V): 8.6%** | Ala (A): 5.1%Arg (R): 5.1%Asn (N): 7.7%Asp (D): 0.0%Cys (C): 0.0%Gln (Q): 5.1%Glu (E): 2.6%Gly (G): 2.6%His (H): 2.6%Ile (I): 2.6%Leu (L): 2.6%Lys (K): 5.1%Met (M): 2.6%Phe (F): 2.6%**Pro (P):17.9%****Ser (S):10.3%****Thr (T):12.8%**Trp (W): 2.6%Tyr (Y): 0.0%**Val (V):10.3%** | **Ala (A):10.0%**Arg (R): 0.0%Asn (N): 0.0%Asp (D): 0.0%Cys (C): 5.0%Gln (Q): 0.0%Glu (E): 0.0%**Gly (G):15.0%**His (H): 0.0%**Ile (I):15.0%****Leu (L):30.0%**Lys (K): 0.0%Met (M): 0.0%Phe (F): 0.0%Pro (P): 0.0%**Ser (S):10.0%**Thr (T): 0.0%Trp (W): 0.0%Tyr (Y): 0.0%**Val (V):15.0%** | Ala (A): 3.9%**Arg (R): 9.8%****Asn (N): 9.8%****Asp (D): 9.8%**Cys (C): 2.0%Gln (Q): 7.8%Glu (E): 2.0%Gly (G): 3.9%His (H): 3.9%Ile (I): 0.0%Leu (L): 5.9%Lys (K): 5.9%Met (M): 7.8%Phe (F): 2.0%Pro (P): 2.0%Ser (S): 3.9%Thr (T): 2.0%Trp (W): 3.9%Tyr (Y): 3.9%**Val (V): 9.8%** |
| **Theoretical pI** |  **6.46** | **5.73** |  **11.0** |  **5.52** |  **9.04** |

**Table S2**. List of primers used in PCR experiments.

|  |  |  |
| --- | --- | --- |
| Primer name | Sequence | pIgR domain |
| pIGR1Fwd forward | 5’- TTACGAGCCTCAGTATGCCAGC -3’ | *E. coioides* D1  |
| pIGR1Rev reverse | 5’- TGCAGAACACCAGTACCAGCC -3’ | *E. coioides* D2  |
| pIGRII forward | 5’- AGGGGGATTCTGGGTGGTA -3’ | *E. coioides* D1  |
| pIGRIIr reverse | 5’- CTTAGTGATGGGTTTGGGTGG -3’  | *E. coioides* EMPD  |
| AAP1 | 5’- GGCCACGCGTCGACTAGTACGGGGGGGGGG -3’ |  |
| AP1 | 5’- GGCCACGCGTCGACTAGTACTTTTTTTTTTTTTTTTT -3’ |  |
| AUAP1 | 5’- GGCCACGCGTCGACTAGTAC -3’ |  |
| TbrtpIgRFwd forward | 5’- AAGAAGTGGTGTCGGAGTGG -3’ | *T. bernacchii* D1  |
| TbrtpIgRRev reverse | 5’- ACCAGCCTGTATCCCTCATC -3’ | *T. bernacchii* D1  |
| TbBACTfw2 | 5’- CCCAGATCATGTTCGAGACC -3’ |  |
| TbBACTrev2 | 5’- CATAGATGGGCACTGTGTGG -3’ |  |

1AAP, AP and AUAP are the Adaptor Primers used in 5’ and 3’ RACE.

2TbBACTfw and TbBACTrev are the primers designed on *-actin* gene, used as housekeeping gene in qPCR.

**Table S3.** List of perciform suborders and respective species investigated for *pIgR* genomic and transcript sequences available.

|  |  |  |  |
| --- | --- | --- | --- |
| **Suborder** | **Species** | **Transcript accession number** | **Genomic scaffold accession number** |
| Notothenioidei | *T. bernacchii**T. loennbergii**D. eleginoides**D. mawsoni**N. coriiceps**H. antarcticus**G. acuticeps**P. georgianus**C. myersi**C. aceratus**C. hamatus**C. gobio* | MZ540772; XM\_034138155.1; XM\_034138156.1JAAOOA010000028.1GHKE01202443JAAKFY010000004XM\_010780285.1CADEHL010001073.1XM\_034231973.1XM\_034231974.1; XM\_034231975.1XM\_034104980.1; XM\_034104981.1RQJG01055183.1OMOC01081144.1GFMN01023039.1XM\_029454169.1 | NW\_022987689.1N/AN/AN/AN/AN/ANW\_022990743.1NC\_047519.1N/AN/AN/ANC\_041371.1 |
| Percoidei | *S. lucioperca**P. fluviatilis* | XM\_036004850.1XM\_039816568.1 | NC\_050181.1NC\_053122.1 |
| *P. flavescens**E. spectabile**E. cragini* | XM\_028593228.1XM\_032532220.1XM\_034887523.1 | NC\_041342.1NC\_045744.1NC\_048418.1 |
| Serranoidei | *E. coioides* | FJ803367.1 | N/A |
| *E. lanceolatus* | XM\_033651131.1 | NC\_047009.1 |
| *P. leopardus* | XM\_042597661.1 | NC\_056474.1 |
| Scorpaenoidei | *S. umbrosus* | XM\_037788606.1 | NC\_051280.1 |
| Cottoidei | *P. pungitius**A. ocellatus* | XM\_037459474.1XM\_031855165.1 | NW\_023616457.1NW\_022280045.1 |
| *C. lumpus**L. tanakae**G. aculeatus* | XM\_034544233.1SRLO01000113.1XM\_040171583.1 | N/AN/ANC\_053214.1 |

**Table S4**. Specific primers used for RT-PCR and sense and anti-sense probes.

|  |  |
| --- | --- |
| ISH  | Sequences  |
| RT-PCR forward | 5’ - GTCACAGTTGAACGCCAAT - 3’ |
| RT-PCR reverse | 5’ - ACAAGGATTACAGAACCAC - 3’ |
| Sense probe forward | 5’ - TAATACGACTCACTATAGGG - 3’ |
| Sense probe reverse | 5’ - ACAAGGATTACAGAACCAC - 3’ |
| Anti-sense probe forward | 5’ - GTCACAGTTGAACGCCAAT - 3’ |
| Anti-sense probe reverse | 5’ - GCATTTAGGTGACACTATAGAATAG - 3’ |