

INVOLVEMENT OF TUMOR NECROSIS FACTOR RECEPTOR ASSOCIATED FACTOR-2 (TRAF-2) OF CHUB MACKERAL Scomber japonicus IN THE CONTEXT OF **ANTIVIRAL, ANTI-APOPTOTIC, AND ACTIVATION OF NFKB PATHWAY**



D.C.G. Rodrigo^{*}, Gaeun Kim, Jeongeun Kim, and Jehee Lee

¹Department of Marine Life Sciences & Fish Vaccine Research Center, Jeju National University, Jeju Self-Governing Province 63243, Republic of Korea

²Marine Science Institute, Jeju National University, Jeju Self-Governing Province 63333, Republic of Korea

chandimagihan@stu.jejunu.ac.kr

Introduction

Tumor necrosis factor receptor associated factor-2 (TRAF-2) is acknowledged as one of the most important molecules that mediate the cellular responses induced by TNF. TRAF family proteins modulate wide variety of responses including regulation of genes involved in inflammation and immune related functions, anti-viral responses, cell proliferation and growth inhibition, cell death and survival. TRAF proteins which include seven family members from TRAF1 to TRAF7 and transduce signals by interacting wide variety of cellular receptors including tumor necrosis factor receptor (TNF-R), Toll like receptor (TLR), RIG-1 like receptor (RLR), nucleotide binding oligomerization domain like receptor (NLR) and even mediate for the cytokine receptors related signaling pathways by regulating immune responses and apoptosis.

Scomber japonicus



Commonly known as Chub mackerel Highly distributed around Indo-Pacific Ocean Major food fish species Migratory marine fish species

Methodology

Sampling and qPCR analysis for spatial and temporal expression

Molecular cloning and functional analysis



Results



MTT assay

120

100

80

40

20

0

200

400

% Cell viability



Conclusion

SjTraf2 was characterized structurally and functionally. In normal physiological conditions, robust expression of SjTraf2 was observed in blood. The expression profile of SjTraf2 was significantly upregulated in the blood upon Poly I:C, LPS, Vibrio harveyi and Streptococcus iniae. SjTraf2 enhances the cell viability of FHM cells under the oxidative stress caused by H₂O₂ and it was concentration dependent. Antiviral genes including *IRF3*, *IRF7*, *ISG-15*, *MX* and *Viperin* and NF-κB were significantly upregulated in SjTraf2 overexpressed FHM cells. Taken together, our findings indicated the prominent role of SjTraf2 modulating the immune responses during oxidative stress and pathogenic infections.

References

R.H. Arch, R.W. Gedrich, C.B. Thompson, Tumor necrosis factor receptor-associated factors (TRAFs) A family of adapter proteins that regulates life and death, Genes Dev. 12 (1998) 2821–2830. https://doi.org/10.1101/gad.12.18.2821.

Multiple sequence allignment

CIDSUBGLATS	21
SQNSL <mark>PC</mark> IPLSVLS	21
CPNSLPCIPLSVLS	21
CTSSLPCIPLSVIS	21
CANSLPCIPLSVDS	21
CPNSLPGIPLSVLS	21
PQGSLDLNQPGFKKEILG	30
PQGSLDLNQPGFKKEILG	28
PPGSLDLNQ <mark>PG</mark> FSKEILG	52
PPGSLDLSQ PG FAKEI I G	25
SPGSLELLQ PG FSKTI II G	25
PPGSLDLLQPGFSKTILG	25
PPGSLELLQPGFSKTILG	25
LNQGCSWTGSIKEYEAQH	121
LNQGCSWTGSIKEYEAQH	121
LNQGCNWTGSIKEYEAQH	121
KNNGCNWRGTIKEYEVGH	130
NNNGCNWRGTIKEYEVGH	128
SAFS	119
INEGCTWKGTIKEYESCH	125
PNDGCTWKGTLKEYESCH	125
PSEGCSWKGTLKDYESCH	125
PSDGCTWKGTLKEYESCH	125
	J.
S <mark>C</mark> AKSKSA <mark>C</mark> PFSEVC <mark>C</mark> KS	221
S <mark>C</mark> VKSKSA <mark>C</mark> PFSEVC <mark>C</mark> KT	221
S <mark>C</mark> AKSKST <mark>C</mark> PFSEVC <mark>C</mark> KS	221
S <mark>C</mark> AKSKSA <mark>C</mark> PFSEVC <mark>C</mark> KS	221
S <mark>CAKSKSAC</mark> PHSEVG <mark>C</mark> KS	221
T <mark>C</mark> AKSKSACPESEVC <mark>C</mark> KS	221
T <mark>CGRCKVPC</mark> RYGALCCTE	230
I <mark>CGRCKVPC</mark> RYAAVGCTE	228
T <mark>CGECEVPC</mark> REHVVGCTE	198
	225
N <mark>CGKCKVPC</mark> RFKVVGCAE	60604
NCGKCKVPCRFKVVGCAE ACSKCRVLCRFHTVCCSE	225
NCGKCKVPCRHKVVGCAE ACSKCRVLCRHHTVGCSE ACGRCRVPCRHAVGCPE	225
NGKCKVPCREKVVGCAE AGSKCRVLCREHTVGCSE AGRCRVPCREHAVGCPE TGKCRVPCREHAIGCLE	225 225 225
NCGKOKVPORFKVVGCAE ACSKORVLORFHTVGCSE ACGRORVPORFHAVGCPE T <mark>C</mark> GKORVP <mark>ORF</mark> HAIGCLE	225 225 225 225
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NCCRVPCRBHVGCAE ACCRVPCRBHVGCAE ACCRVPCRBHAGCPE TCCRVPCRBHAGCPE TCCRVPCRBHAGCPE TCCRVPCRBHAGCPE TCCRVPCRBHAGCLE NALENIVCVLNREVERSS NALENIVCVLNREVERSS NALENIVCVLNREVERSS NALENIVCVLNREVERSS NALENIVCVLNREVERSS NALENIVCVLNREVERSS TTFENIVCVLNREVERSS TTFENIVCVLNREVERSS TTFENIVCVLNREVERSS TTFENIVCVLNREVERSS TTFENIVCVLNREVERSS ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFENIVCVLNREVERSA ATFSSKYCKMCLRIVLN AFYSSKYCKMCLRIVLN AFYTSKYCKMCLRVLNA AFYTSKYCKMCLRVLNA	225 225 225 318 312 312 312 316 323 223 223 223 223 312 323 223 223 312 323 223 323 3
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NCCKVPCRBHVGCAE ACCKVPCRBHVGCAE ACCKVPCRBHAGCPE TCCKCVPCRBHAGCPE TCCKCVPCRBHAGCPE TCCKCVPCRBHAGCPE TCCKCVPCRBHAGCPE TCCKCVPCRBHAGCPE TCCKCVPCRBHAGCPE NALENIVCVLNREVERSS NALENIVCVLNREVERSS NALENIVCVLNREVERSS NALENIVCVLNREVERSS NALENIVCVLNREVERSS TTFENIVCVLNREVERSS TTFENIVCVLNREVERSS TTFENIVCVLNREVERSS TTFENIVCVLNREVERSS TTFENIVCVLNREVERSS TTFENIVCVLNREVERSS ATFENIVCVLNREVERSS AFFSIVCVLNRE	2255 2255 2255 312 312 312 312 312 316 323 323 297 412 412 412 412 412 412 412 412 412 412
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Xiphophorus maculatu Oreochromis niloticu mphiprion ocellaris icentrarchus labrax ates calcarifer enopus laevis Xenopus tropicalis Caretta caretta illus gallus Mus musculus Bos taurus