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

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

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

chandimagihan@stu.jejunu.ac.kr

Introduction

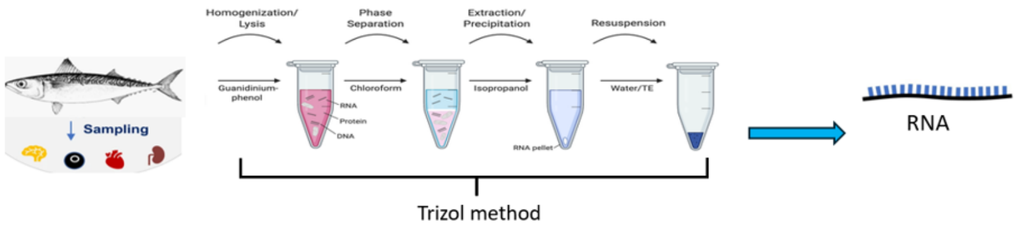
Tumor necrosis factor receptor associated factor-2 (TRAF-2) is acknowledged as one of the most important molecules that mediate the cellular responses induced by TNF. TRAF family proteins modulate wide variety of responses including regulation of genes involved in inflammation and immune related functions, 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

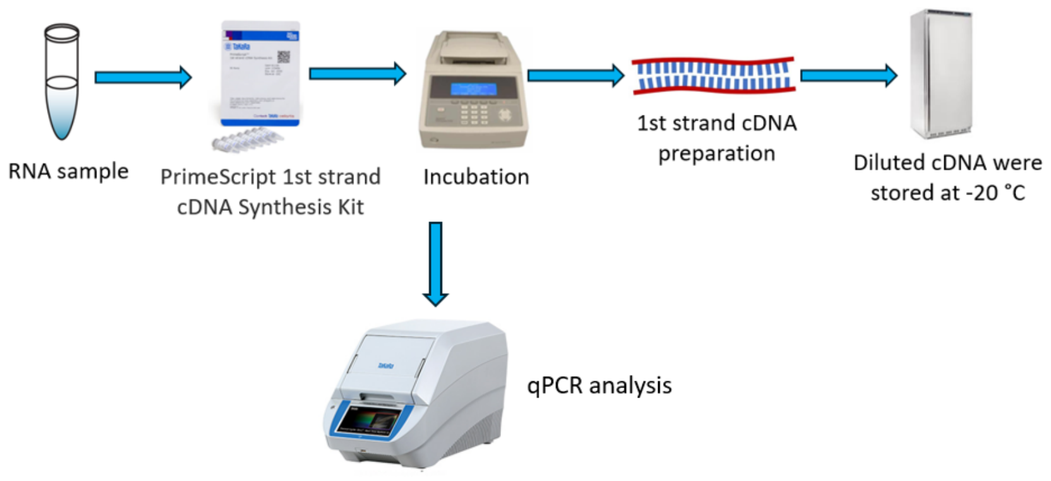
Commonly known as Chub mackerel
Highly distributed around Indo-Pacific Ocean
Major food fish species
Migratory marine fish species

Methodology

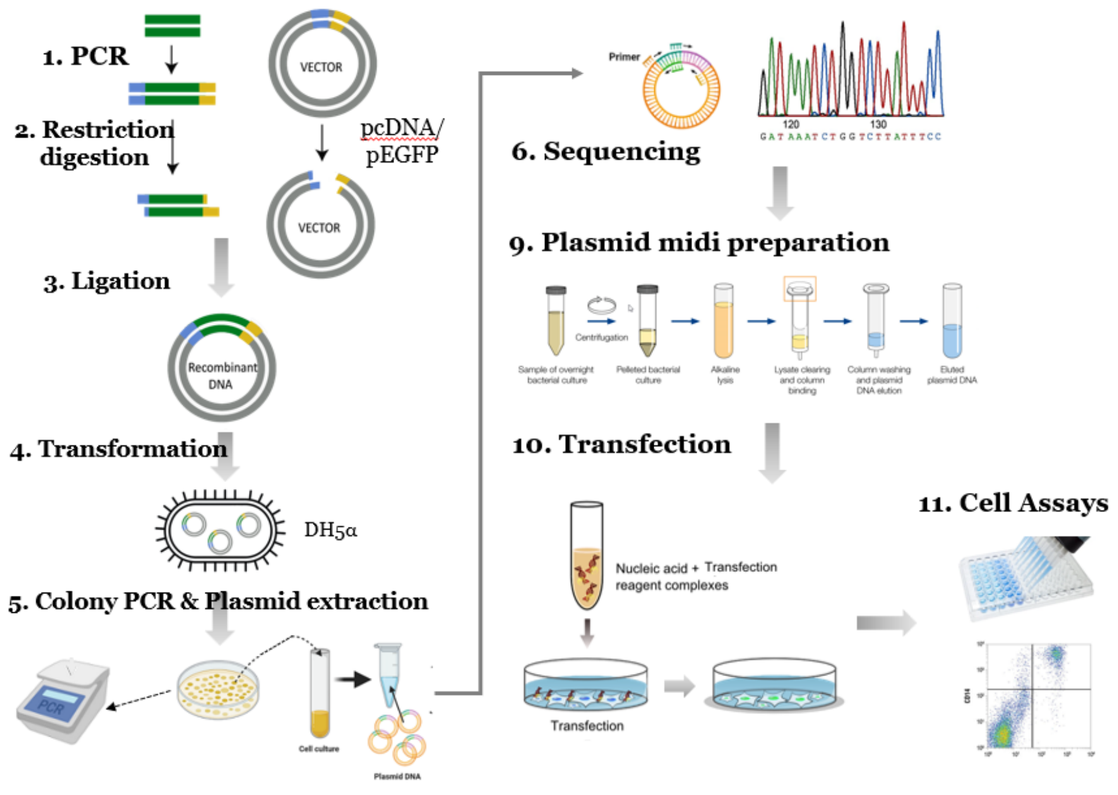
Sampling and qPCR analysis for spatial and temporal expression



- The quality and quantity of RNA was detected using 1.5% agarose gel electrophoresis and µDrop Plate



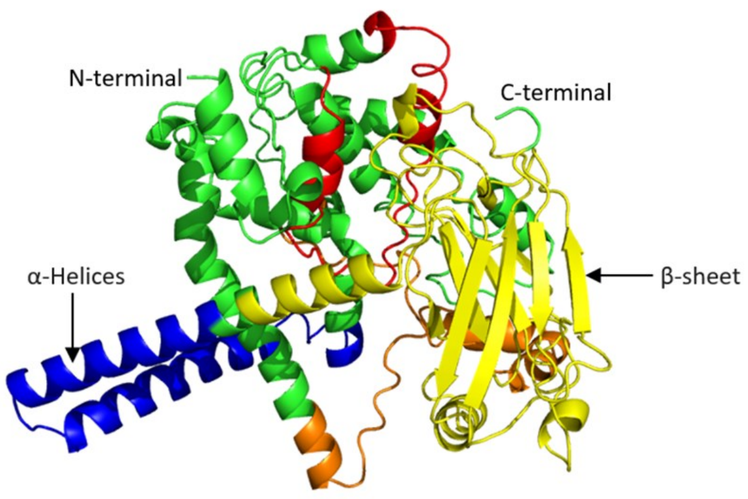
Molecular cloning and functional analysis



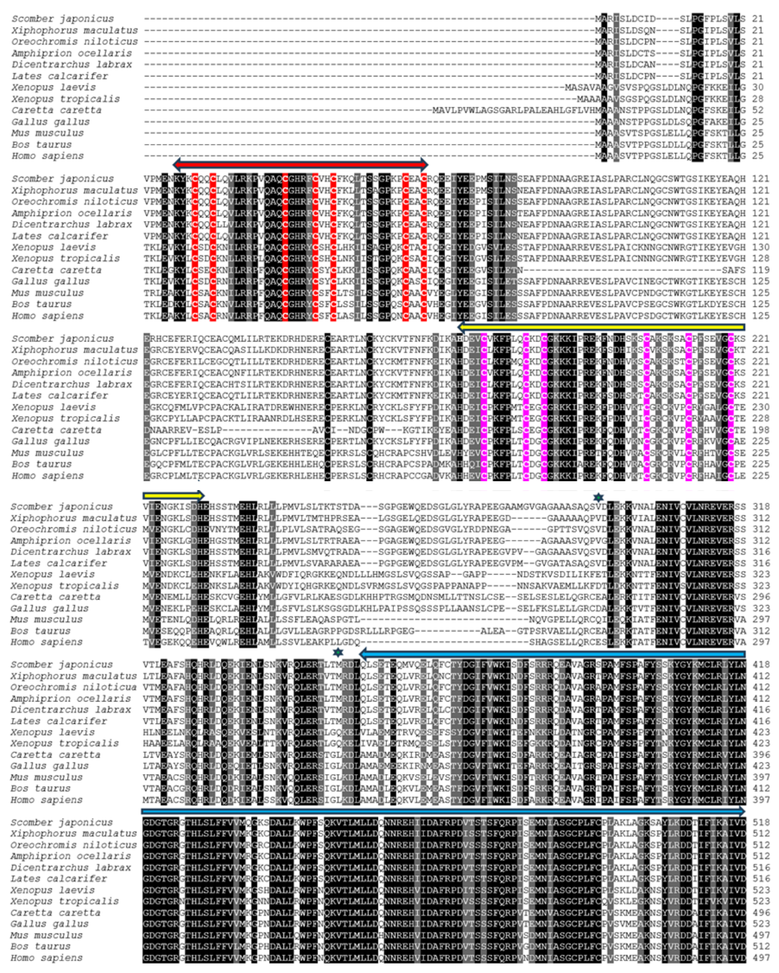
Results

In-silico analysis

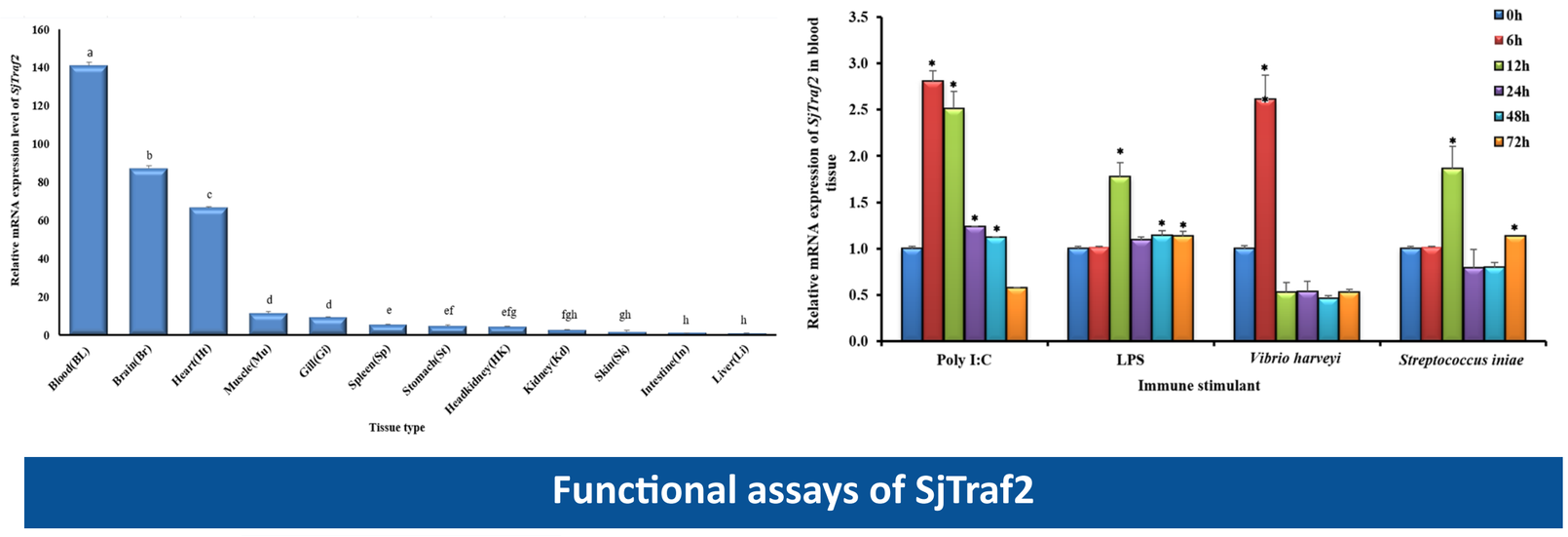
3D structure of SjTraf2



Multiple sequence allignment

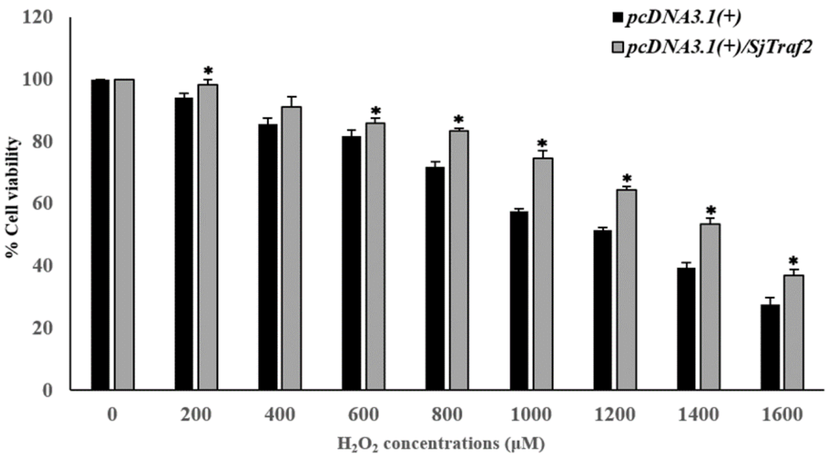


Spatial and temporal expression analysis of SjTraf2

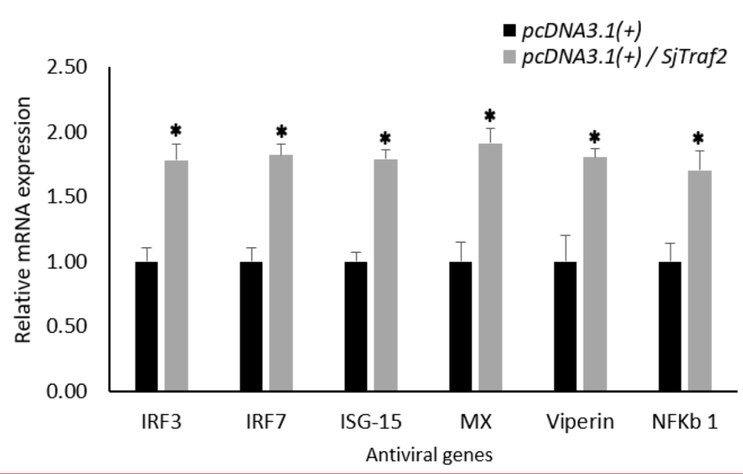


Functional assays of SjTraf2

MTT assay



Antiviral gene expression



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 up-regulated 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 H_2O_2 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.