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Molecular architecture and characterization of an actin gene from the pacific abalone, *Haliotis discus hannai*

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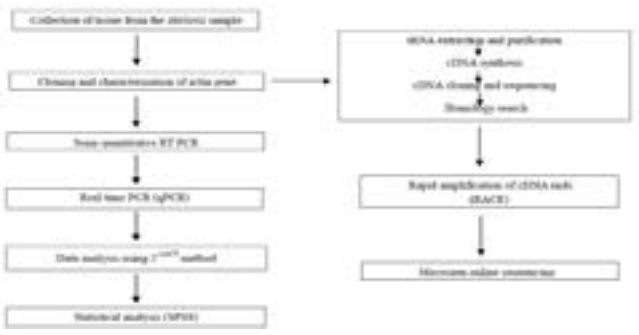
Statement of the Problem: Actins are highly conserved proteins of ATPase super family that involved in the ATP binding domain of the Hsp70 related proteins, sugar kinases, actin-related proteins and prokaryotic actin homologue. In this study, a 976 bp sequence was cloned from the neural ganglion of pacific abalone, *Haliotis discus hannai*. The coding sequence of 270 bp translated into a protein of 89 amino acid residue. A BLAST search indicated that this protein represents 68% and 56% identity with rainbow abalone and pacific oyster respectively. Moreover, alignment of two or more sequences revealed that the amino acid sequence of *Haliotis* has 42-56% similarity with mammalian and other abalone actin sequences. Phylogenetic analysis demonstrates that our predicted clone formed cluster with rainbow abalone due to intense similarity of amino acid signature. Semi quantitative reverse transcription (RT)-PCR, quantitative PCR (q-PCR) confirmed that actin gene is highly expressed in Cerebral Ganglion (CG) which indicates CG might be correlated with abalone cell motility, structure, integrity and intercellular signalings.

Methodology & Theoretical Orientation:

Amino acid sequences of actin gene from pacific abalone

MEPPQTEVFLSGGAIIDFIVLGARAVISFCESAIPGNMIVVPPERTVLAYKSLRISTSHFM
MELVVVSWIPADDNVIDGLPHMLKFT



Findings: Isolation of a 976 bp actin gene from the cerebral ganglion of pacific abalone containing 270 bp coding region of 89 amino acid residues. Our cloned gene and *Haliotis iris* actin gene formed cluster due to similar taxonomic classification and sequence identity.

Conclusion & Significance: Actin sequence of our clone might have a potential to regulate cell movement, formation, integrity and signaling mechanism.

Recent Publications

1. Sumi K R, Kim S C, Howlader J, Lee W K, Choi K S, Kim H T, Park J I, Nou I S, Gilmour K M and Kho K H (2018) Molecular cloning and characterization of carbonic anhydrase XII from pufferfish (*Takifugu rubripes*). International Journal of Molecular Sciences 842:1-18.
2. Kim S C, Sumi K R, Sharker M R and Kho K H (2018) Molecular identification and expression of myosin light chain in shortspine spurdog (*Squalus mitsukurii*). Journal of Marine Science and Application 3:1-8
3. Sumi K R, Kim S C, Natarajan S, Choi K S, Choi M R, Kim H T, Park J I, Noi I S, Gilmour K M and Kho K H (2018) Molecular cloning and characterization of secretory carbonic anhydrase VI in pufferfish (*Takifugu rubripes*). Gene 640:57-65.
4. Kim S C, Sumi K R, Kim J W, Choi M R, Min B H and Kho K H (2016) Carbonic anhydrase I in a cartilaginous fish, the shortspine spurdog (*Squalus mitsukurii*). Ocean Science Journal 51:373-379.
5. Sumi K R, Nou I S and Kho K H (2016) Identification and expression of a novel carbonic anhydrase isozyme in the pufferfish Takifugu vermicularis. Gene 588(2):173-179.

Biography

Md Rajib Sharker has completed his graduation in the Fisheries Biology and Genetics. During his graduation program he has published research article regarding biology of fishes in peer reviewed journal. Now, he is conducting PhD program in the Molecular Physiology lab under the division of fisheries science, Chonnam National University. Currently, he is working on molecular cloning and isolation of growth and reproduction related gene from the pacific abalone, *Haliotis discus hannai*. He also gained insight of knowledge concerning larval and embryonic development of abalone species which will be assisted on rearing and culture technology of abalone.

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