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Importance of molecular endocrinological studies in optimization of aquaculture: An overview with finfish and shellfish models

Optimization of aquaculture would require in-depth understanding of metabolism of the candidate species, especially with respect to that of growth and reproduction, the two major high energy demanding processes. In fishes, growth hormone and insulin like growth factors are known to play major role in development and metabolism, studies have allowed discernment of a complex, tissue-specific collection of IGF-I transcripts, through alternative splicing. Recent studies have enabled us to formulate synthetic hormones that could shorten the growth time needed for farm-raised fish to reach market size. Interestingly in crustaceans (crabs, shrimps etc.), regulatory mechanisms rely on the intricate balancing between stimulatory and inhibitory principles. Here, the ecdysteroids, secreted by the Y-organ and the terpenoid methyl farnesoate, secreted by the mandibular organ act as stimulatory hormones for growth and reproduction, respectively. Further, the neuro-secretory cells from the decapod eyestalks are known to produce molecules that could inhibit growth and/or reproduction. Information gathered on the inhibitory hormones from the eyestalk has paved the way for using de-eyestalking as a potential tool for induced breeding in female shrimps and lobsters. However, recent observations reveal that in spite of its efficacy in artificially induced egg maturation in female crabs and shrimps for one cycle, de-eyestalking is no more considered as a technique of consistency for induced breeding. Results of recent investigations on hormone receptors provide us with valuable clues on viable possibilities for inducing growth and reproduction and optimization of aquaculture, to be discussed during the proposed talk.

Biography

Anilkumar Gopinathan is the Senior Professor at the Vellore Institute of Technology, India, has completed his Postdoctoral training (hormone receptor genes) from the University of Oklahoma, USA. He had been Visiting Scientist to University of Gdansk (Poland), Belarus State University and University of Oklahoma (DST-NSF). He has also chaired scientific sessions in several international conferences and delivered plenary lectures on topics with a bias to aquaculture.

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