Zebrafish (*Danio rerio*) Cell Line as Robust Model to understand Myogenesis

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Abstract—*Fish cell lines have recently emerged as a promising model and a suitable substitute to the classical mammalian systems to study physiology, cancer biology and transgenics. In recent years, with the development and characterization of several fish cell lines, the scope of its vast applications in the study of biomedical research, toxicology, gene regulation, gene expression, and gene transfer have widened.*

Background: *Myogenesis or muscle growth in fish is of great economic importance as an organized understanding of the genetic pathways involved in regulation of muscle development and growth, through the growth hormone/insulin-like growth factors, GH-IGF system, is critical for the recognition of specific genes that have large phenotypic effects on production and quality traits in most commercially important fish species. The myostatin or GDF-11 is a key regulator in muscle growth of fish as well as human. Also, the understanding of myogenesis would reveal the specific biochemical interaction of drug used for human diseases.*

Result: *DRM, a fibroblast cell line was developed from zebrafish (Danio rerio) muscle and characterized using molecular methods using 16SrRNA & COX1 gene & immunochemistry methods using GFP, Green Fluorescent Protein, a well-established marker for gene expression studies. MTT assay and Trypan blue assay was performed to assess the viability and proliferation of cells. Flow cytometry was performed to calculate DNA content to confirm genetic stability. RNA was isolated from the cells for RNAi (RNA interference) study. Conclusion: The application of RNAi based screening in authenticated muscle cell lines could be an effective tool to understand the highly regulated multi-step process, myogenesis and has potential application in aquaculture biotechnology and biomedical research.*

Keywords: *Cell lines, Fish cell lines, myogenesis, myostatin, biomedical research.*