**Transgenic and genomic approaches in the zebrafish model**

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Over the past twenty years, the zebrafish has been rapidly and widely recognized as a valuable experimental model in vertebrate development, genetics and medicine. Many experimental tools such as cell lineage tracing, cell transplantation, whole mount in situ hybridization, chimeric embryos, transgenesis, morphlino knock-down, large scale of nutagenesis, EST resources, genome mapping and sequencing, etc., have been well established. In the past few years, our laboratory has applied two powerful experimental tools in zebrafish, transgenesis and DNA chip, to investigate gene expression from single cloned gene to global expression profile. Now our research scope has been extended from development to biotechnology, environmental toxicology and biomedical studies. In the present presentation, I will review our journey in transgenic zebrafish from developmental analyses to biotechnology and medical applications such as ornamental fish (GloFish), environmental protection, bioreactor, cancer models, etc. Currently, we are also using DNA chips to investigate expression profiles in zebrafish cancer cells in comparison with that in human cancers. In particular, we are embarking on a zebrafish toxicogenomic project using the zebrafish DNA chip to investigate global expression profiles after treatment with different chemicals. We demonstrated that the expression profiles can be used to distinguish distinct chemicals encountered by zebrafish and thus it is possible to develop biomonitoring zebrafish DNA chips for environmental protection.