

Talk Abstract

The Use of Zebrafish as a Model to Study Calcium-related Diseases of Humans.

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Over the last 10 years, the zebrafish (*Danio rerio*) has become one of the most popular animal models to study vertebrate development. This small freshwater fish offers many advantages to the study of organ and tissue development that are not provided by other animal model systems. In recent years, the value of the zebrafish as a model for human disease has also been recognized. Several zebrafish mutants that exhibit distinct "human" disease phenotypes have been found. These span a variety of human pathologies, including heart disease, diabetes, muscular dystrophy, neurodegenerative disease and kidney disease.

In our lab we use zebrafish to study the role played by calcium ions in a wide range of developmental and biomedical processes. Calcium signaling is studied through the use of the calcium-sensitive bioluminescent protein, aequorin, which can either be microinjected into cells or transgenically expressed without disturbing function or development. The patterns of light that are emitted by an aequorin-loaded cell, tissue or organ, reveals the changing patterns and levels of free calcium. We are currently using zebrafish to study the role of calcium signaling during normal muscle and kidney development, as well as during Duchenne muscular dystrophy and Polycystic kidney disease, two conditions where a loss of calcium homeostasis, in the muscle and kidney, respectively, has been implicated. Supported by the following grants: HKUST6016/01M HKUST6214/02M, HKUST6279/03M & N_HKUST607/01.