Biology 6 (Research Institute for Microbial Diseases: RIMD)

Day 4, July 16, 3:10-4:40pm

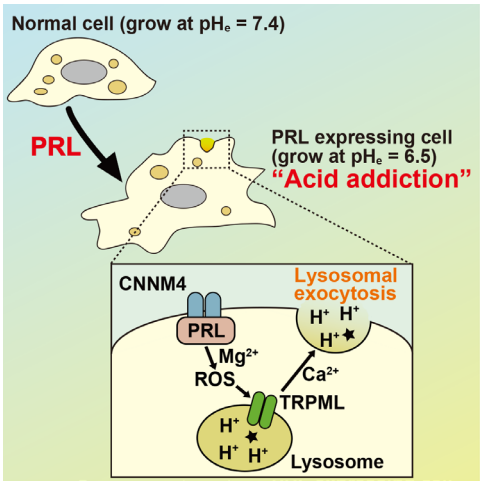
Institute HP: http://www.biken.osaka-u.ac.jp/en/

In this session, we will introduce the research topics conducted by two scientists at the Research Institute for Microbial Diseases (RIMD), Osaka University. In 1934, the Research Institute for Microbial Diseases (RIMD), the first institute attached to Osaka University, was established for the study of microbial diseases. For more than 80 years since its foundation, the RIMD has concentrated on basic researches in infectious diseases, immunology, and oncology and made significant contributions to the control of infectious diseases through the identification of new pathogens, the elucidation of pathogenesis of microbes, and the development of vaccines and diagnostics based on these basic research findings. In addition, the RIMD has achieved an outstanding contribution in the progress of life sciences through the discovery of oncogenes and cell fusion phenomena and the elucidation of innate immune system.

1. Hiroaki Miki, Professor, Department of Cellular Regulation

Lab HP: http://www.biken.osaka-u.ac.jp/en/laboratories/detail/13

Adaptation mechanism of cancer cells to acidic microenvironments

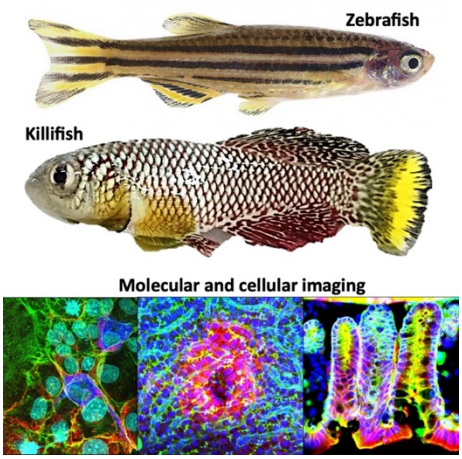


Cancer is a leading cause of death worldwide, killing approximately 10 million people in one year. Cancer cells have a unique energy metabolism consuming a large amount of glucose, resulting in the generation of lactate and acidification of the tumor microenvironments that surround cancer cells. Such acidified environments are generally toxic and harmful to cells, which are normally adapted to physiological pH around 7.4, but malignant cancer cells can actively proliferate under the acidic condition. Our laboratory has been investigating the

function of molecules involved in malignant development of cancers, and recently found a novel adaptation mechanism of cancer cells to acidic microenvironments by driving membrane trafficking of lysosomes to extrude proton.

2. Tohru Ishitani, Professor, Department of Homeostatic regulation
Lab HP: http://www.biken.osaka-u.ac.jp/en/laboratories/detail/52

Investigation of the molecular basis underlying tissue homeostasis and aging using small fish



In our body, cells recognize their position and role and behave accordingly via cell-cell communication. Such behavior supports tissue morphogenesis and homeostasis, while its dysregulation is involved in congenital malformation, cancer, degenerative diseases, and aging. We focus especially on the cell-cell communication and behavior supporting tissue homeostasis and explore unknown molecular systems controlling embryonic development, organogenesis, regeneration, aging, and disease, using *in vivo* imaging, animal model genetics, molecular and cell biology, and biochemistry techniques. One of the most striking features of our study is “model animals”. We are mainly using small fish, such as zebrafish and turquoise killifish, which are suitable for imaging analysis and aging study, respectively. I will introduce our recent studies using these models.