3D Plant Cell Organelles via Virtual Reality (VR) Experience

School of Life Sciences, Centre for Cell and Developmental Biology,
RGC-AoE Centre for Organelle Biogenesis and Function, The Chinese University of Hong Kong
Ms. Jenny LAI & Prof. Liwen JIANG

7 Decebmer 2018

Summary

This project aims at developing micro-modules using the latest Virtual Reality (VR) technique to enhance students' learning experience in new models of plant cell biology. A VR mobile application "3D Plant Cell Organelles in VR" is generated, in which students could explore and interact with 3D plant cell organelles in a stimulating cell environment.

Students could explore and interact with 3D plant cell organelles in a stimulating cell environment via our mobile application and VR goggles

VR Experience during Lecture

The VR mobile application that incorporates the micro-modules was made available on the iOS and android online application stores. VR goggles were provided to students to view the VR application in the lectures using their own mobile phones. The micro-modules have been put into use for teaching the courses of *CMBI4001 Protein Trafficking* and *LSCI5012 Advanced Topics in Biological Electron Microscopy and Live Cell Imaging* in 2018 Term1.

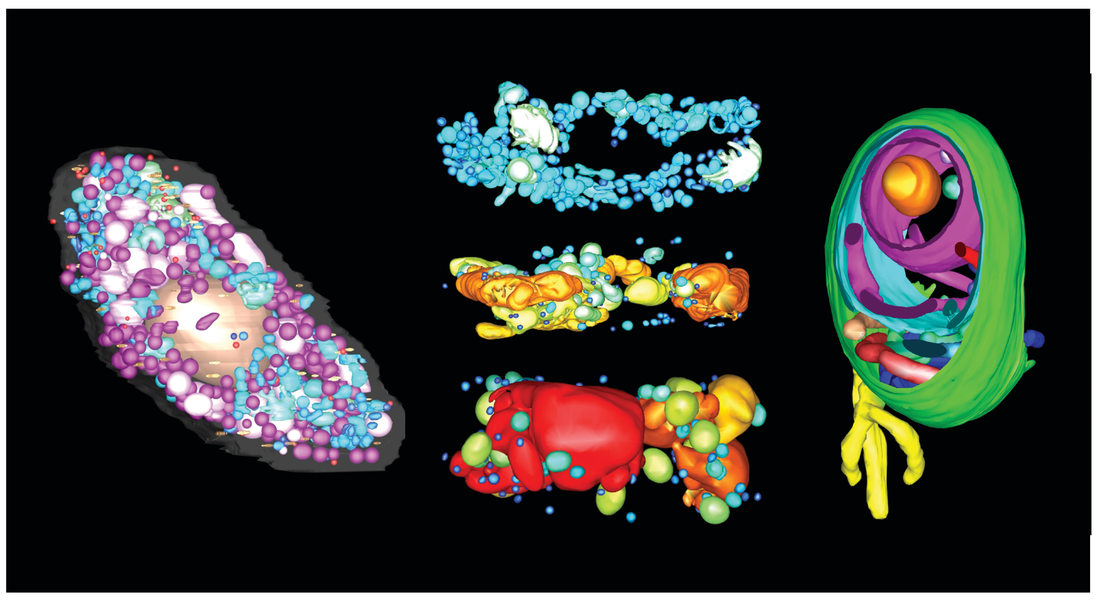
Students having VR experience during lecture

3D Plant Cell Organelles in VR

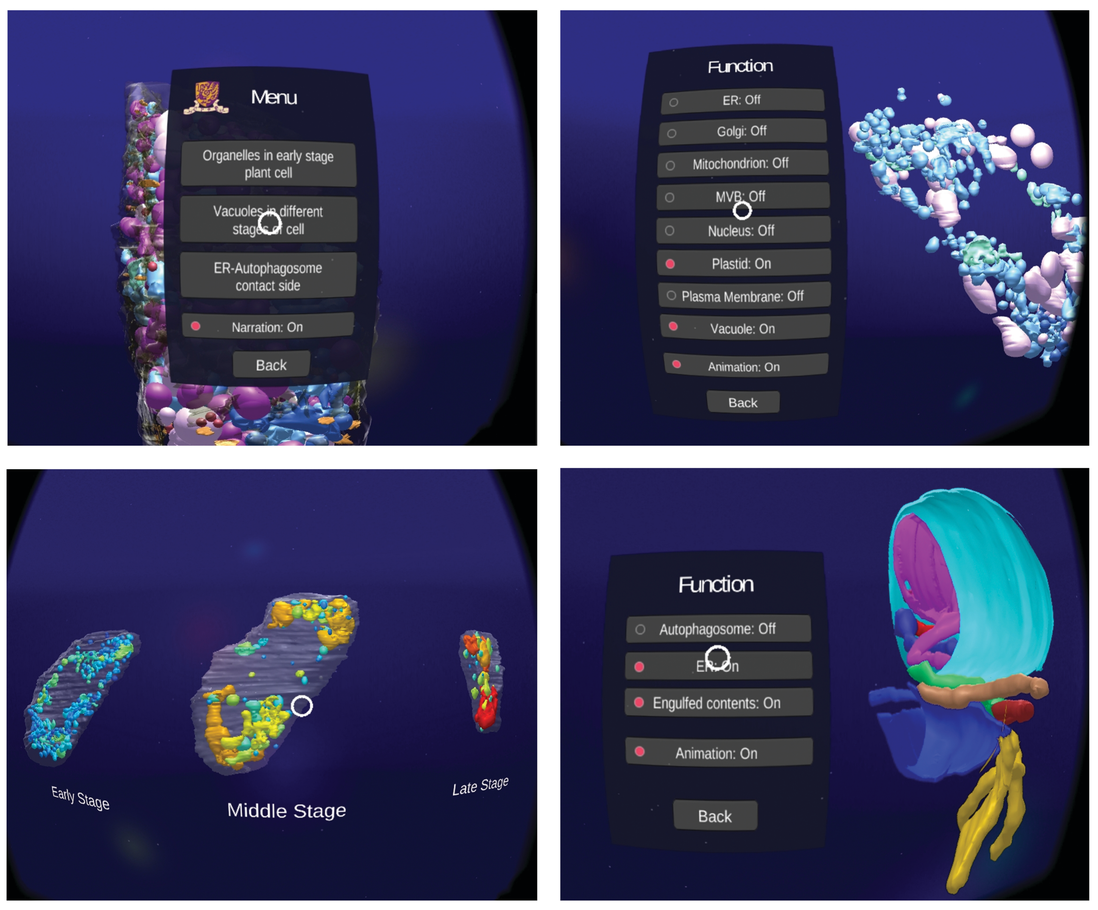
In this project, 3 micro-modules were produced and incorporated into the VR mobile application:

1. Organelles in early stage of a plant cell
2. Vacuoles in different stages of plant cells
3. ER-Autophagosome contact site

First, we have constructed 3D models of selected plant cell organelles based on real research data derived from our own research using the most advanced 3D Tomography TEM (transmission electron microscopy) system and the image processing, modeling and display program IMOD. The 3D models produced for the 3 micro-modules are shown below:



Second, we have developed a VR mobile application for both iOS and android operating systems to supplement students' understandings towards selected plant organelles and their functions. Some screen captures from the application are shown below:



The project is supported by Micro-Module Courseware Development Grant, Scheme 1: Basic Scheme 2017-18 (Additional Call)