OIST SEMINAR

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DATE: **Monday, July 1, 2019**
TIME: **10:00 – 11:00**
VENUE: **D015 Seminar Room, Level D, Lab 1**

Towards induced pluripotent cell-derived sensory neurons for fate commitment of bone marrow stromal cell-derived Schwann cells and beyond.

Abstract:

Our ultimate goal of in vitro derivation of Schwann cells (SchCs) from adult bone marrow stromal cells (BMSCs) is such that they may be used autologously to assist post-traumatic nerve regeneration. Our experiments indicated that neuro-ectodermal progenitor cells among the human hBMSCs could be selectively expanded and then induced to differentiate into SchC-like cells. Co-culture of the SchC-like cells with embryonic dorsal root ganglion neurons (rat) facilitated contact-mediated signaling that accomplished the switch to fate-committed SCs. Microarray analysis and in vitro myelination provided evidence that the human BMSC-derived SchCs were functionally mature. This was reinforced by repair and myelination phenotypes observable in vivo with the derived SchCs seeded into a nerve guide as an implant across a critical gap in a rat model of sciatic nerve injury.

We then adapted a highly efficient chemical protocol to differentiate human induced pluripotent stem cells (iPSCs) into functional sensory neurons. The derived sensory neurons expressed membrane-bound cues that directed BMSC-derived SchC-like cells to fate-committed SchCs. This fulfills the need for a surrogate of human dorsal root ganglion neurons in the translation to a protocol whereby human BMSC-derived SchCs achieve fate commitment and meet safety requirements for autologous transplantation and remyelination therapy.