NANYANG
THE INNOVATIVE POLYTECHNIC

Small molecules for selective in-vitro stem cells removal
(NYP ID: 0336)

Technology
A novel class of heterocyclic compounds for inducing cell death in specific stem cells

Type of IP and status
Patent provisionally filed (US application)

Overview
A major concern in human embryonic stem cell (hESC)-derived cell replacement therapy is the risk of tumorigenesis from undifferentiated hESCs residing in the population of hESC-derived cells. Removal of these undifferentiated hESCs from the differentiated derivatives is a critical step before stem cell therapies can be applied in a clinical setting.

We have identified a group of small organic molecules that are highly cytotoxic to hESCs. This class of compounds are also highly specific in their activity against hESCs allowing in vitro rapid removal and selective killing of undifferentiated hESCs in a heterogeneous population of cells. In vitro treatment of differentiated stem cell progenies prior to clinical transplant will destroy undifferentiated cells thus reducing the probability of rouge stem cell tumour formation in the patient. Likewise, abrogation of stem cell tumour formation in vivo may possibly be achieved via administration of this class of compounds as seen in a small rodent model.

Potential Applications
- **Enrichment of differentiated stem cell progenies** in stem cell biotechnology companies, regenerative medicine companies and research laboratories
- **Novel stem cell therapies** in pharmaceutical and regenerative medicine companies

Advantages
- Highly specific and potent in their activity against hESCs
- In vitro rapid and selective killing of undifferentiated hESCs