

Stem cells and regenerative medicine in the Asian region

Vichit Punyahotra

Mae Fah Luang University, Thailand

In the past decade, stem cell research and regenerative medicine have received much attention by research institutes and companies based in the Asian region. However, there are very few companies that can deal with global development in the biotechnology market. For the time being, government support in driving the growth of this particular industry is still limited. Private or institutional investors are not yet convinced to take a risk on a company developing a product using science that few people understand. Only a handful of countries have developed regulatory framework for regenerative medicine approval. Japan and South Korea are probably the only two countries in Asia that can offer regenerative medicine products and technologies having approval from regulatory authorities. Degenerative diseases including cardiovascular diseases, stroke, diabetes, Alzheimer's disease, liver cirrhosis, bone and joint diseases and kidney failure are difficult to treat. The existing conventional treatments are expensive and not very effective. Regenerative medicine could help cut down on the costs and provide more effective outcome. The idea behind regenerative medicine is to replace or regenerate cells or organs that have been damaged. In theory, regenerative medicine could someday grow a new liver or replace damaged brain cells, treat spinal cord injuries, heart diseases, brain diseases and more. Much of regenerative medicine relies on stem cells, which are the building blocks of organs and tissues. Stem cells and their progenitors offer great hope for treating diseases by providing an unlimited source of cells for repairing or replacing damaged tissues and organs. Hematopoietic stem cell transplantation is the application of bone marrow, peripheral blood and cord blood stem and progenitor cells in order to establish marrow and immune functions in patients with a variety of cancers and non-malignant disorders. These include leukemia, lymphoma, multiple myeloma, bone marrow failure and thalassemia. Mesenchymal stem cells (MSCs) are stromal cells that have the ability to self-renew and can differentiate into more than hundred tissues and organs. MSCs can be isolated from a small aspirate of bone marrow or adipose tissue from the patient and can be harvested from baby teeth and umbilical cord tissues. This type of stem cell is easy to be cultivated and expanded *in vitro*. They are able to moderate immune response which make them good candidate for regenerative medicine especially to be used for allogeneic transplantation. The understanding of stem cell aging in the pathological tissue and malignant tumor is highly relevant for future development in biomedicine. Moderation of physiological and pathological processes might open new perspective to restore organ function lost by disease or physical trauma or to overcome pathophysiological conditions.

Biography

Vichit Punyahotra is currently a senior lecturer of School of Anti-aging and Regenerative Medicine of Mae Fahluang University, President of Health Foundation and President of Institute of Asean Integrative Medicine. He is also an American Board certified plastic surgeon having been trained in Cornell University, U.S.A. His areas of expertise include alternative medicine, holistic medicine, anti-aging medicine and energy medicine.

Notes: