EDITOR'S LETTER

During the course of living a natural human life, it is likely that we will encounter one or more major injury events or diseases/infections that can be either life-threatening itself or will cause significant impairment of our body functions either temporarily or permanently. For example, it can be in the form of an acute trauma to a body part or organ such as traumatic brain injury, spinal cord injury or stroke. It can also be an acute viral infection that targets a certain organ or tissue – such as in hepatitis A, an acute viral infection can threaten the integrity and function of a large portion of the liver. If you are lucky enough to survive the acute phase of such physical insult to your body, you will be pleased to know that your body is amazingly resilient. Almost all human organs and tissues have a built-in ability to make remarkable recovery from an injury or disease/infection-induced damage. This is often achieved by the organ/tissue undergoing significant remodeling, recovery and regeneration.

Tissue regeneration speaks to the concept that the organ or tissue can either (i) mobilize the resident cells to self-rebuild tissue mass by cell activation, cell hypertrophy and/or cell proliferation, thus regaining tissue infrastructure and function, or (ii) activate adult stem cells within the organ to differentiate into new functional cells. Basic and clinical researchers in regeneration medicine have learned to mimic these mother-nature tricks by transplanting stem cells or other related progenitor cells to the injured organ to aid its regeneration. More recently, there is also a concept of not transplanting cell outright, but rather discovering and testing protein or small molecule drugs that target certain organ promote and enhance its endogenous regenerative signaling pathways after injury or disease conditions.

In this issue, our theme is in fact titled "Life-saving opportunities: A Guide to Regenerative Medicine". We have three special articles to highlight this area. First Dr. Lam (Chinese University of Hong Kong) and colleagues discuss a novel topical application of mesenchymal stem cells to treat brain trauma and liver trauma in rodent models. They show that this new fibrin-matrix assisted application enhances the survival of the MSC in the target organ. In the second feature, Dr. Sun (Virginia Commonwealth University, USA) discusses the two tracks of brain repair and regeneration following neurotrauma – (i) exploring the regenerative potentials of endogenous neurogenesis to promote neural regeneration, and (ii) stem cell transplantation for brain repair and regeneration. Her article covers the three most popular stem cell types currently used in regenerative research: embryonic stem cells, adult neural stem cells and bone marrow stromal cells. Lastly, Dr. Cheah (Asian American Liver Centre, Singapore) describes the remarkable regenerative abilities of liver. Her article goes on and explains how this knowledge is now being exploited as a new paradigm of liver transplantation – the concept of living donor liver transplantation.

We hope that you will enjoy this specific issue of APBN. Please write and provide your feedback to us. We are always looking forward to hearing from you.

Guest Editor for APBN March 2016

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LIFE-SAVING OPPORTUNITIES:

A Guide to Regenerative Medicine