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Progress and Updates in Stroke Research: Introduction to the Special Issue on Stroke

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and Samantha M. Portis⁶

Abstract

As guest editors of this special issue, we are delighted to present 13 articles that discuss advances in stroke research including translational stroke research, stroke research milestones, and proposals for future directions. Stroke is a major cause of disability, and, according to the Centers for Disease Control and Prevention, is the fifth leading cause of death in the US alone. Possible factors contributing to stroke pathogenesis are elucidated and possible treatment modalities are explored in the following special issue of *Cell Transplantation*.

Keywords

Stroke

The first two articles in the issue are review articles, the first of which by Li et al., discusses cerebral small vessel disease (CSVD), which is composed of several types of disorders. In this review, the authors discuss disease pathogenesis and the different types of CSVD, and summarize the current preventative measures and therapeutic interventions. The second review article, by Zheng et al., discusses preclinical and clinical mesenchymal stem cell (MSC) therapy studies for stroke.

The first original research article of the issue by Wang et al. examines how the major adipokine, adiponectin (APN), was able to have a protective effect against oxygen and glucose deprivation (OGD)-induced ischemia and reperfusion injury in hippocampal neurons. The next article by Venkat et al. focuses on how Vasculotide, a mimetic of another neuroprotective factor, angiopoietin-1 (Ang1), decreases inflammation after stroke in diabetic rats.

In their *in vitro* study, Tan et al. discuss how preconditioning human neuroblastoma cells by maintaining them in a hypoxic environment reduces oxidative stress and activates the autophagy pathway. Wang et al. discuss another possible therapeutic target in stroke, non-coding RNA, which may allay pathogenic stroke-related processes including excitotoxicity, oxidative stress, neuroinflammation, and apoptosis. Similarly, Xu et al. review articles regarding microRNAs and how they participate in stroke pathophysiology, suggesting they may also be future therapeutic targets.

As recent studies have shown resveratrol to have protective effects against ischemia and reperfusion injury, Yang

et al. discovered that optimal treatment with resveratrol after stroke occurs when resveratrol is administered multiple times. Gautam and Yao discuss how pericytes play a role in stroke pathogenesis through their role in the integrity of the blood-brain barrier (BBB), angiogenesis, and other cerebrovascular processes.

Gao et al., discuss how multiple stem cell types and their possible mechanisms of repair such as tissue repair, promotion of neurogenesis and angiogenesis, anti-apoptosis, and

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immunoregulation. Tang provides a comprehensive update on MSC transplantation for stroke, discussing different MSC sources, mechanisms of action, safety, and future prospects.

This special issue provides a substantial update on stroke research within the context of cell therapy and endogenous cellular repair. The Editorial Office and Guest Editors would

like to extend our sincere gratitude to the contributors for making this special issue a wellspring of knowledge in this field.

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