Tentative Outline

Special Thematic Issue for the journal *Current Neuropharmacology*

Caspase Functions in Acute Brain Injury

Guest Editors: John H. Zhang, Lei Huang, Cameron Lenahan, Yuanjian Fang

- **Scope of the Thematic Issue:**

Caspases belong to a family of cysteine proteases with diverse functions. They are involved in maintaining genomic stability, metabolism, autophagy, and aging. Some caspases also participate in tissue differentiation, regeneration, and neural development. After acute brain injury, the activation of caspase cascades contributes to pro-inflammatory processes (e.g. caspases 1, 4, 5, 11, and 12) and programmed cell death including apoptosis, necroptosis, and pyroptosis (e.g. caspases 1, 8, 11), promoting secondary brain injury. The significant pathological role of caspases makes them prime therapeutic targets in the setting of acute brain injury.

Efforts to target caspases in the clinical setting have been hindered because of the toxicity and poor pharmacokinetics associated with their inhibitors. However, recent advancements have led to the development of safe and effective caspase inhibitors in animal models, and have demonstrated viability in several neurological diseases, such as multiple sclerosis, myasthenia gravis, and Alzheimer's disease. Its proven efficacy in chronic neurological conditions warrants the exploration of new caspase-targeting strategies in the setting of acute brain injury.

In the current special issue, our objective is to compile translational work pertaining to caspase functions in acute brain injury, including ischemic/hemorrhagic stroke and traumatic brain injury. We hope this topic will improve our knowledge of the signaling pathways involved in regulating caspase activation and crosstalk between various caspases, and identify new therapeutic targets of caspases for patients with acute brain injury.

Keywords: cell death, caspase, stroke, traumatic brain injury, neuroinflammation, cerebral edema, acute brain injury

Sub-topics:

The sub-topics to be covered within the issue should be provided:

- Novel mechanisms of caspase regulation in acute brain injury
- New functions of caspases in acute brain injury
- Drug developments targeting caspase cascade pathway in acute brain injury
- Biomarkers for accessing caspase activities in acute brain injury

Tentative titles of the articles and list of contributors:

Caspases-induced brain injury in stroke.

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Current advances of caspases targeting secondary injury of intracerebral hemorrhage: from bench to bedside.

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Default Mode Network Connectivity and Brain Derived Trophic Factor in Brain Stimulation of TBI patients
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The role of caspases following subarachnoid hemorrhage.
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Advances in the Apoptosis Repressor with Caspase Recruitment Domain in hemorrhagic stroke.
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Biological Effects and Mechanisms of caspases in early brain injury after subarachnoid hemorrhage.
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The role of caspases in the hemorrhagic stroke: From mechanism to pharmacological outlook.
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Crosstalk between programmed cell death and caspases in acute brain injury.
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Schedule:

- ✧ Thematic issue submission deadline: October 1, 2021

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