

Special Issue on Multimodal Regulation of Brain Function by Astrocytes

CALL FOR PAPERS

Astrocytes constitute a major class of nonneuronal cells which tile the entire central nervous system. These glial networks are intimately juxtaposed with synapses, such that a single astrocyte with its fine processes can monitor hundreds of thousands of them. Such a structural configuration places astrocytes in a unique position to modulate neural function over multiple spatial scales.

Despite lacking electrical excitability, astrocytes display robust intra- and intercellular calcium signaling abilities with different temporal domains which aid in the synthesis, release, and recycling of multiple chemical transmitters and metabolites. In the last twenty years, astrocytes have been found to participate in multiple aspects of brain function, such as synaptic transmission and plasticity, neuromodulation, and large-scale system-level responses affecting the synchronization of neural networks, brain metabolism, and vasculature control. The contribution of astrocytes to brain function is thus an integrated response of multiple signaling pathways occurring at distinct time scales and territories and targeting various cell types. Time and space are, therefore, of the essence for understanding the roles of the astrocyte in brain function.

With this backdrop, we are pleased to announce this special issue. We hope that this endeavor will bring together an essential understanding of how multidimensional pathways in astrocytes, across different time scales and levels of organization, are integrated and contribute to functional outputs.

Recognizing the prominent work you have recently published in this area, we would like to invite you to contribute to this special issue. We strongly encourage submissions of articles containing original research results, but review articles of exceptional merit will also be considered.

Potential topics include but are not limited to the following:

- ▶ Modulation of synaptic transmission and plasticity
- ▶ Volume transmission and transport or recycling of neurotransmitters
- ▶ Potassium ion buffering in health and disease
- ▶ Synapse formation
- ▶ Control of vasculature
- ▶ Astrocytes as physical barriers against pathological agents
- ▶ Role in inflammatory mechanisms
- ▶ Metabolism, lactate shuttle, and glycogen
- ▶ Computational models (of any of the above)

Authors can submit their manuscripts through the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/np/mrbf/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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