Involvement of astrocytes in neurovascular communication

- M. Nuriya[*],
- H. Hirase[†,]

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Abstract

The vascular interface of the brain is distinct from that of the peripheral tissue in that astrocytes, the most numerous glial cell type in the gray matter, cover the vasculature with their endfeet. This morphological feature of the gliovascular junction has prompted neuroscientists to suggest possible functional roles of astrocytes including astrocytic modulation of the vasculature. Additionally, astrocytes develop an intricate morphology that intimately apposes neuronal synapses, making them an ideal cellular mediator of neurovascular coupling. In this article, we first introduce the classical anatomical and physiological findings that led to the proposal of various gliovascular interaction models. Next, we touch on the technological advances in the past few decades that enabled investigations and evaluations of neuro-glio-vascular interactions *in situ*. We then review recent experimental findings on the roles of astrocytes in neurovascular coupling from the viewpoints of intra- and intercellular signalings in astrocytes.

Keywords

- Astrocyte;
- Calcium;
- Neurovascular coupling;
- Endfeet;
- Gap junction;
- Potassium;
- AQP4

Corresponding author: Tel.: +81-48-4676918; Fax: +81-48-4679652