

Redox control of brain calcium in health and disease

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Calcium ion is a highly versatile cellular messenger. Calcium signals-defined as transient increments in intracellular-free calcium concentration- elicit a multiplicity of responses that depend on cell type and signal properties such as their intensity, duration, cellular localization, and frequency. The vast literature available on the role of calcium signals in brain cells, chiefly centered on neuronal cells, indicates that calcium signals regulate essential neuronal functions, including synaptic transmission, gene expression, synaptic plasticity processes underlying learning and memory, and survival or death. The eight articles comprising this forum issue address different and novel aspects of calcium signaling in normal neuronal function, including how calcium signals interact with the generation of reactive species of oxygen/nitrogen with various functional consequences, and focus also on how abnormal calcium homeostasis and signaling, plus oxidative stress, affect overall brain ph