



Novel Functions of Phytohormones in Animal Brains

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Commentary

I would like to extend my warmest congratulation to the successful launch of Archives of Science. As a neuroscientist, I am interested in the understanding of how our brain copes with stress and injury. It is known that plant stress hormones, such as abscisic acid (ABA) and its major catabolite phaseic acid (PA), play important roles in higher plants against a variety of environmental stresses, such as cold, drought, heat exposure, salinity. However, whether animals use this type of molecules for stress response remains an interesting question. In particular, the presence and function of ABA and its derivatives such as PA in animal brains are not known. Our current studies discovered the presence of plant naturally occurring (-)-PA in the brains of mouse and rat. These studies are published in the recent issue of *Journal of Biological Chemistry*, a premier life science journal and one of the 68 Nature Index journals.

The work was in collaboration with Professor Suzanne Abrams's team who is a world expert on ABA-related phytohormones in the

Plant Biotechnology Institute in the National Research Council of Canada. Together our experimental data showed that (-)-PA is expressed in the cerebral blood vessels and choroid plexus and functions to reversibly and transiently inhibit a major brain receptor called NMDA receptors. These receptors are responsible for neuronal injury during hypoxia caused by stroke. Importantly, our studies demonstrated that naturally occurring PA in the brain may serve as an endogenous protector for neurons.

This is the first report of (-)-PA presence in rodent brains and revealed a previously unknown role of PA serving as an endogenous mechanism of neuroprotection in ischemic brain, and suggest that (-)-PA or its analogues can be developed as a powerful agent for neuroprotection against stroke. Our research is supported by grants from the National Natural Science Foundation, National Key Laboratory of Neuroscience of China and Shenzhen Municipal Government Science and Innovation Committee.