DONG HEE CHOI

ASSOCIATE PROFESSOR

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Educations

1996 B.S., Konkuk University, Seoul, Korea
1999 M.S., Seoul National University, Seoul, Korea
2004 Ph.D., Korea University, Seoul, Korea

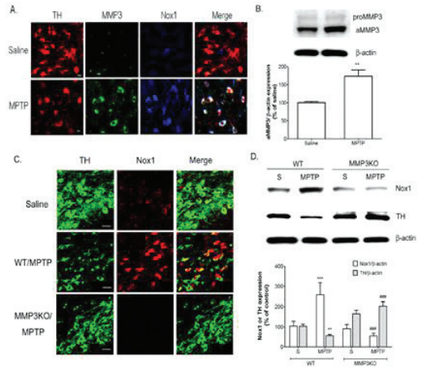
Professional Background

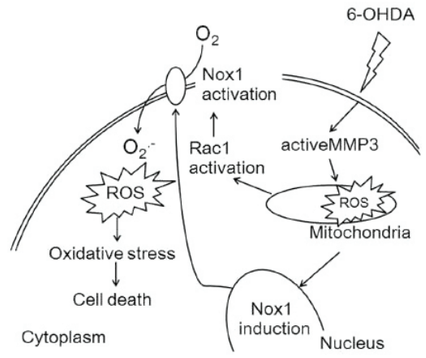
2014-Present Editorial board member: International Journal of Neurology Research
2011- Present Associate professor: Dept. of Medical Science, Konkuk Univ., Korea
2008-2011 Research professor: Center for Neuroscience, IBST, Konkuk Univ., Korea
2005-2008 Post-doctoral fellow: Dept. of Neurology & Neuroscience, Weill Medical College of Cornell Univ., USA
2004-2005 Research professor: Dept. of Biochemistry and Molecular Biology, Univ. of Ulsan College of Medicine, Korea

Top 5 Publications

■ **Choi DH**, Kim JH, Lee KH, Kim HY, Kim YS, et al. Role of neuronal NADPH oxidase 1 in the peri-infarct regions after stroke. PloS one. 2015; 10(1):e0116814
■ **Choi DH**, Lee KH, Kim JH, Seo JH, Kim HY, et al. NADPH oxidase 1, a novel molecular source of ROS in hippocampal neuronal death in vascular dementia. Antioxidants & redox signaling. 2014; 21(4):533-50
■ **Choi DH**, Cristóvão AC, Guhathakurta S, Lee J, Joh TH, et al. NADPH oxidase 1-mediated oxidative stress leads to dopamine neuron death in Parkinson's disease. Antioxidants & redox signaling. 2012; 16(10):1033-45
■ **Choi DH**, Hwang O, Lee KH, Lee J, Beal MF, et al. DJ-1 cleavage by matrix metalloproteinase 3 mediates oxidative stress-induced dopaminergic cell death. Antioxidants & redox signaling. 2011; 14(11):2137-50
■ **Choi DH**, Kim YJ, Kim YG, Joh TH, Beal MF, et al. Role of matrix metalloproteinase 3-mediated alpha-synuclein cleavage in dopaminergic cell death. The Journal of biological chemistry. 2011; 286(16):14168-77

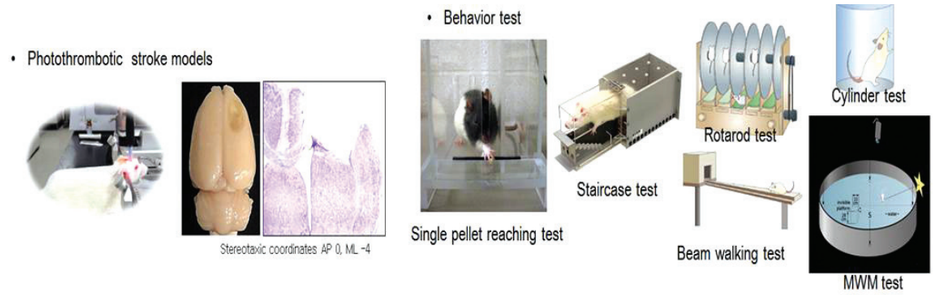
1. NADPH Oxidase 1 in Neurological Diseases





My research explores the molecular mechanisms that underlie selective degeneration of specific neuronal populations in neurodegenerative disorders, particularly Parkinson's disease (PD).
Although oxidative stress is considered as a major contributing factor in PD, the molecular sources for ROS in PD remain poorly understood. Emerging evidence has demonstrated that NADPH oxidases, the specialized superoxide-generating enzyme complex, play a key role in oxidative stress in various disease conditions of the central nervous system. We recently discovered that the NADPH oxidase 1 (NOX1)/Rac1 system is activated in dopaminergic neurons under various stress conditions, and plays a key role in oxidative stress-mediated dopaminergic neuronal degeneration. This research is currently supported by National Research Foundation of Korea.

2. Neurorepair in Stroke



We are also investigating the mechanisms that underlie injury and recovery following stroke. The aim of this research is to develop a novel therapy for stroke recovery. Our approaches involve the use of neuroprotective agents that target oxidative stress, including Nox inhibitors, low-level light therapy, task-specific training, modulation of Eph/ephrin expression, epigenetic modification, and axon inhibitory molecule modification, and their effects on functional recovery and corticospinal tract plasticity after stroke. We use molecular, surgical, and behavioral techniques, including flow cytometry, confocal immunohistochemistry, exercise training, hypoxic exposure, and delivery of neurotherapeutics.