

## Neuroprotective effects of *Erinacine A* from *Hericium erinaceum* submerged culture mycelium

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*Erinacine A*, the main representative of erinacines existed only in the *Hericium erinaceum* mycelium, was found to induce nerve growth factor (NGF) synthesis *in vitro*, and was proved could cross the blood–brain barrier *in vivo*. Other studies showed this compound also increased catecholamine and NGF content in the central nervous system of rats. In this study, we investigated the production of erinacine A in 20T fermenter and its identification by use of LC-MS-MS and NMR. Purified erinacine A and mycelium extracts were used to treat PC12 cell line for evaluating neural differentiation. Our results showed that erinacine A induced neural differentiation of PC12 cells in a dose dependent manner. In an *in vitro* study, we examined the effects of erinacine A on amyloid  $\beta$ -peptide (25-35) induced neurotoxicity in primary cortical neurons. In our *in vivo* data demonstrated induced neurogenesis by erinacine A in transgenic (APP/PS1) mice. We then investigated the neuroprotective effects of *H. erinaceum* in a MCAO and Parkinson's model in rat. Results showed infarct volumes markedly reduced in rat receiving 300 mg/kg *H. erinaceum* treatment for 5 days prior to 1.5 hr MCAO. Oral treatment of *H. erinaceum* dry mycelium powder (300 mg/kg) in Parkinson's disease rats showed increased brain dopamine and tyrosine hydroxylase content. *H. erinaceum* safety assessment showed no treatment related toxicity in rat garaged up to 3000 mg/kg for 28 consecutive days.

### Biography

Chin-Chu Chen received his PhD degree in toxicology and bioactivity at National Tsing Hua University in Taiwan. His primary field is industrial liquid fermentation of mushroom mycelium such as *Ganoderma lucidum*, *Cordyceps* and *Antrodia cinnamomea* and uses these ingredients to develop health foods. His group had 19 patents and published more than 25 papers in reputed journals. He is currently the vice general manager of Grape king Bio and head of Bioengineering Center. He served for professional professor in Hung-Kuang University and Associate Professor in Shin-Chien University, National Hsinchu University, National Changhua University, Chung-Yuan Christian University and Yuanpei University.

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