

**Brain-derived neurotrophic factor (BDNF)/TrkB signaling is activated through filial imprinting in domestic chicks (*Gallus gallus domesticus*)**

Naoya Aoki<sup>1</sup>, Shinji Yamaguchi<sup>1</sup>, Daisuke Kobayashi<sup>1</sup>, Takaaki Kitajima<sup>1</sup>, Eiji Iikubo<sup>1</sup>, Sachiko Katagiri<sup>1</sup>, Toshiya Matsushima<sup>2</sup> and Koichi J. Homma<sup>1</sup>

1. Faculty of Pharmaceutical Sciences, Teikyo University, 2. Department of Biology, Faculty of Science, Hokkaido University

Filial imprinting is a behavior in which a neonatal bird remembers the characteristics of its parents and then follows them. Domestic chicks have been intensively studied as a model for the imprinting. Brain-derived neurotrophic factor (BDNF) plays an important role in activity-dependent synaptic plasticity such as long-term potentiation, which underlies learning and memory in rodents. Here, we show that the role of BDNF/TrkB signaling in the filial imprinting. BDNF mRNA levels increased in the intermediate medial hyperpallium apicale (IMHA), caudal area of the visual wulst, of imprinted chick brains. The upregulation of the gene expression in IMHA correlated with the strength of the preference to the imprinted object. In addition, BDNF/TrkB-PI3K/Akt signaling was activated through the training of filial imprinting. However, the pharmacological deprivation of TrkB phosphorylation in IMHA did not impair the memory formation and local injection of BDNF into IMHA did not enhance. These results suggest that activation of BDNF/TrkB signaling in IMHA during filial imprinting is not involved in the memory acquisition.