

# 第 507 回学内セミナー（大学院セミナー）

日時：平成 27 年 7 月 2 日（木）18:00～19:00

会場：院生棟 1 階 セミナー室

演者：Gail Tripp 先生

(Human Developmental Neurobiology Unit, OIST Graduate University, Professor)

演題：Reinforcement, Dopamine and ADHD

## 【要 旨】

Attention deficit hyperactivity disorder (ADHD) is the diagnosis given to children and adults demonstrating persistent and developmentally inappropriate levels of inattention, hyperactivity and impulsivity that impair daily functioning. The disorder is common, affecting 5.9-7.1% of children and 5% of adults. While assumed to be neurobiological in origin, the precise etiology and pathophysiology of ADHD remains uncertain. Several researchers have proposed that individuals with ADHD have an altered sensitivity to positive reinforcement that contributes to symptoms of ADHD. Using signal detection methodology we have demonstrated that children with ADHD show: (1) increased sensitivity to individual instances of reward; (2) a stronger preference for immediate over delayed reward, a finding replicated with the spontaneously hypertensive rat (SHR), an established animal model of ADHD; and (3) reduced sensitivity to changing reward contingencies, compared to typically developing children. Drawing on the extensive evidence linking dopamine cell activity to positive reinforcement, we formulated the dopamine transfer deficit (DTD) hypothesis as a neurobiological explanation for such altered processing of positive reinforcement (Tripp & Wickens, 2008). Specifically we hypothesize that the transfer of dopamine release from reward delivery to reward-predicting cues, observed in animal studies, may be deficient in ADHD. Disruption of this anticipatory dopamine signal would result in an abnormal sensitivity to delayed or discontinuous reinforcement and increase the salience of individual instances of reward, leading to symptoms of ADHD. The results of a recent fMRI study provide preliminary support for the DTD hypothesis. Striatal responses to reward-predicting cues and reward delivery were assessed in a classical conditioning paradigm. During reward anticipation, increased blood-oxygen-level-dependent (BOLD) responses were observed in the right ventral and left dorsal striatum of controls, but not those with ADHD. The opposite pattern was observed in response to reward delivery; the ADHD group demonstrated significantly greater BOLD responses in the ventral striatum bilaterally and the left dorsal striatum relative to controls. The implications of altered reward processing and the DTD hypothesis for understanding and managing ADHD are discussed.

Tripp, G. & Wickens, J.R. (2008). Research review: dopamine transfer deficit: a neurobiological theory of altered reinforcement mechanisms in ADHD. *Journal of Child Psychology and Psychiatry*; 49: 691-704.

本学内セミナーは大学院セミナーも兼ねていますので、大学院 1・2 年生は是非出席して下さい。

(必修科目「医科学基礎総論」「医科学特論」「先端応用医学概論」の出席回数にカウントされます)

また、字内の研究者間の交流をはかることも目的としていますので、多数の御米聴をお願い致します。  
大学院セミナーは、福和会・白翁会・本学医学部名誉教授からのご援助を受けています。

[子どものこころの発達研究センターAge2 企画、大学院セミナー企画部会]