東北大学脳科学 GCOE セミナーのお知らせ

日時　2009 年 6 月 8 日（月）16:00〜17:30

会場　星陵キャンパス・5 号館 2 階　201 号室

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演題　Postnatal neural cell differentiation and hippocampal neurogenesis: relevance for addiction and schizophrenia

Addiction and schizophrenia are widely recognized as brain diseases, albeit ones compounded by myriad genetic and environmental factors. While the primary targets of addiction and schizophrenia-related research and treatment efforts has been the “reward” circuitry, e.g. dopaminergic projections from the ventral tegmental area to the nucleus accumbens and prefrontal cortex, the hippocampus is receiving increasingly more attention for its potential role in these psychiatric disorders. This renewed focus on the hippocampus for clues to addiction and schizophrenia is perhaps not surprising given that the hippocampus is (a) anatomically positioned to influence brain reward circuitry; (b) altered both structurally and functionally in the brains of patients with these disorders and in animals models; (c) undergoes significant postnatal development, which is meaningful given that this period is tightly linked to the etiology of both addiction and schizophrenia. Therefore it is compelling that exposure to a wide variety of drugs of abuse and models of schizophrenia can regulate the birth, differentiation and/or survival of new dentate gyrus hippocampal neurons in the postnatal brain. Here we review the work on the proliferation, differentiation, and survival of postnatally-generated neurons in the hippocampal dentate gyrus in animal models relevant to addiction and schizophrenia and in postmortem tissue. We will emphasize our recent work on the molecular (e.g. Cdk5, Notch, NeuroD) and microenvironmental (e.g. cytokines, vasculature) basis for postnatal neurogenesis and its alterations after drug exposure (e.g. cocaine, methylphenidate, opiates), and present new data suggesting a novel role for postnatally-generated dentate gyrus neurons in addiction. We will also provide insight into how adult hippocampal neurogenesis is altered in schizophrenic brains post-mortem, and discuss our hypothesis about the role of reduced postnatal neurogenesis in schizophrenic symptoms and treatment. While this talk will specifically highlight how alterations in hippocampal neurogenesis may influence the development, trajectory, and treatment of addiction and schizophrenia, it will also provide a broad framework from which to address the question of whether new neurons are a meaningful target for understanding and treating psychiatric disorders in general.

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