P-02.006 Neuronal diversity in the visual wulst of the strawberry finch, estrilda amandava

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Objective: The study of neuronal diversity of the visual wulst of Estrilda amandava and its comparision with dorsal cortex of reptiles and visual cortex of mammals.

Methods: The neuro-anatomical details were studied by neuro-histochemical techniques such as Golgi Colonnier and Rapid Golgi method.

Results: The wulst neurons can be classified into four main cell types: projection neurons having spinous dendrites and their axons project widely within same or different region; local circuit neurons having aspinous dendrites, with local axon arborization; stellate neurons are small and having sparsely spinous thin dendrites and granule cells are small sized and their axons locally arborize. The projection neurons further subclassified into pyramidal (moderately and sparsely spinous) and multipolar neurons (highly, moderately and sparely spinous). Moderately spinous pyramidal neurons are present in the HA whereas sparsely spinous pyramidal neurons in the HD. The highly and moderately spinous multipolar neurons encounter in the HA, HI and HD whereas moderately and sparsely spinous multipolar neurons found in the IHA and HD respectively. The granule cells are two types spinous and aspinous, restricted only in the IHA. Local circuit neurons are present in the all laminae except IHA. Stellate neurons take place in the all four laminae. The dendrites have spines (synaptic knob) with small stalk which bear a knob like structure which provide space for synapse. The synaptic morphology of the dendrites varies in the different neurons as well as regions. These neurons are comparable with the reptilian dorsal cortex and mammalian visual cortex.

Conclusion: The visual wulst of the birds homologous to the reptilian dorsal cortex and mammalian visual cortex.

Policy of full disclosure: None.

P-02.007 Structural plasticity of the hippocampus in a genetic rat depression model after repeated seizures

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Objective: Structural plasticity in hippocampus plays an important role in the pathophysiology of depression and effects of anti-depressant therapy. The underlying mechanism of the therapeutic effect of Electroconvulsive Therapy (ECT) is still unclear. Here we investigated whether repeated electroconvulsive seizures (ECS), an animal model of ECT, on rats induce structural plastic changes in the hippocampus.

Methods: ECS or sham treatment was given daily for 10 days to the Flinders Sensitive Lines (FSL) rats and their controls the Flinders Resistant Line (FRL) rats, a genetic rat model of depression. Subsequently, the forced swim test was carried out on day 11. Following sacrifice, unbiased stereoloy methods, the volume of hippocampus was estimated.

Results: The results showed that the FSL-sham group displayed significantly higher immobility in the forced swim test compared with the FRL-sham group ($F_{3,32} = 174.33$; $p < 0.001$). Following treatment, the FSL-ECS group showed a significant decrease in immobility compared with the FSL-sham group ($F_{3,32} = 188.88$; $p < 0.001$). Moreover, the hippocampal volumes were significantly smaller in the FSL-sham group compared with the FRL-sham group ($F_{3,32} = 6.31$; $p < 0.01$). Following treatment, the hippocampal volumes were significantly increased in the FSL-ECS group compared with the FSL-sham group ($F_{3,32} = 65.34$; $p < 0.001$), and also the hippocampal volume in the FRL-ECS groups were significantly increased compared with the FRL-sham group ($F_{3,32} = 65.34$; $p < 0.001$).

Conclusion: In conclusion, the volumes of hippocampus were significantly smaller in the FSL rats compared with the FRL rats. Repeated ECS treatment can significantly increase the volume of hippocampus, correlated to decreased immobility in the forced swim test. Our results support the neuronal plasticity hypothesis that depressive disorders may be related to impairments of structural plasticity in hippocampus, and antidepressant treatment may counteract the structural impairments.

Policy of full disclosure: None.

P-02.008 The time of prenatal stress challenge influences the specificity of behavioral abnormality exhibited in neurodevelopmental disorders

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Objective: Maternal stress during pregnancy has been linked to an increased risk for impaired behavioral and emotional development in children. Prenatal stress (PNS) during the late gestational period has profound effects on the function of hypothalamo-pituitary-adrenal (HPA) axis and changes in adult behavior have been widely reported. However, only a few studies have investigated the impact of stress exposure during the early gestational period in animal models. The objective of the present study was to investigate the effect of timing of prenatal stress on the specificity of behavioral abnormalities in adult offspring.

Methods: Pregnant rats on gestation day 9 (GD9) to GD 14 received 45 min of mild restraint stress, three times a day. Another group of pregnant rats received same stress stimulus during the late gestation days (from GD15 to GD20). The adult offspring (12-week) were then examined using the open field test, the sucrose preference test, the pre-pulse inhibition test (PPI), and the forced swimming test respectively.

Results: In the open field test, the rats exposed to prenatal stress on GD9 showed a decreased total distance when compared to control and GD15PNS. Further, a PPI deficit was also shown in GD9PNS test in female. The order of sucrose preference from higher to lower was: GD15PNS > control > GD9PNS. However, there was no difference in forced swimming data between the three groups.

Conclusion: Early exposure to stress caused a significant deficit of sensory motor gating function, locomotor activity and sucrose preference. Gender differences were also found in the PPI and sucrose preference tests. The abnormal behavior following early prenatal stress exposure may be relevant to schizophrenia, depression or autism.

Policy of full disclosure: None.