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Abstract

Abstract of a poster presentation.

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Novel Implications of Lingo-1 Signaling in the Prefrontal Cortex and Hippocampus of Perinatal Phencyclidine Treated Rats in a Neurodevelopmental Model of Schizophrenia

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Background: Leucine-rich repeat and immunoglobulin domain-containing protein Lingo-1, is a potent negative regulator of axonal myelination and neurite extension. Nogo receptor (NgR)/TNF receptor orphan Y (TROY) and/or p75 complex, With No Lysine (K) (WNK1) and Myelin transcription factor-1 (Myt1), have been reported as co-receptors/co-factors of Lingo-1 signaling in the brain. We investigated the developmental profile of Lingo-1 signaling proteins in a phencyclidine (PCP) neurodevelopmental rat model of schizophrenia.

Methods: Male Sprague Dawley rats received subcutaneous injections of PCP (10mg/kg) or saline at postnatal days (PN)7, 9 and 11. Rats (n=6) were sacrificed at three time points, PN12, 5 weeks or 14 weeks. Protein expression levels of Lingo-1, NgR, p75, TROY, WNK1 and Myt1 were examined within the prefrontal cortex (PFC) and hippocampus (HPC) of the treated rats.

Results: Myt1 was decreased in PCP treated rats at PN12 in both PFC and HPC (10-18%; $p \leq 0.044$). p75 was also decreased in HPC of PCP treated rats at PN12 (16%; $p = 0.011$). There were no significant changes in the expression of any of the tested proteins in either brain region at PN 5 weeks ($0.129 \leq p \leq 0.909$). At PN 14 weeks, Lingo-1, NgR, TROY and WNK1 were increased in the PFC (7%-18.5%; $0.002 \leq p \leq 0.036$) and p75, TROY, and Myt1 were increased in HPC (14.5%-22%; $0.0149 \leq p \leq 0.022$) of PCP treated rats.

Conclusions: This is the first study to have shown an alteration of Lingo-1 signaling pathways in a neurodevelopmental schizophrenia animal model. This will allow us to gain a better understanding of the mechanisms implicated in schizophrenia.