NEUROSCIENCE 2012

Presentation Abstract

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Presentation Title: Role of F3/contactin in hippocampal synaptic plasticity and memory.

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Abstract: F3/Contactin (F3) is a cell-adhesion molecule belonging to the immunoglobulin superfamily, involved in several aspects of neural development, including building and maintaining of synapses. F3 is highly expressed in structures mediating learning and memory, such as the hippocampus, and the aim of our study was to investigate its role in hippocampal synaptic plasticity and memory at different ages. We used transgenic (Tg) mice in which F3 expression is driven by TAG-1 gene regulatory sequences (TAG/F3 mice), which undergo increased F3 expression in late developing forebrain. We analyzed memory by using Morris Water Maze and Object Recognition Test; in addition, electrophysiology allowed us to evaluate: i) basal synaptic transmission (BST); ii) paired pulse facilitation (PPF), a short-term plasticity, thought to reflect presynaptic mechanisms; iii) long-term potentiation (LTP), a pre- and post-synaptic long-term plasticity thought to underlie learning and memory. We found that TAG/F3 mice showed no difference either in behavioral performance or in electrophysiology when compared to wild type littermates at young age (3-5 months), whereas adult (12-15 months) and old (18-22 months) TAG/F3 homozygotes displayed an improvement in memory, synaptic plasticity, and CREB phosphorylation. Our data clarify the physiological role of F3 and suggest that the molecule may be a positive modulator of synaptic plasticity and memory. Consistent with the concomitant decrease in CREB and F3 levels in aged mice, our results might be useful for future therapeutical approaches aiming at improving cognition in aged people.

Disclosures: **D. Puzzo:** None. **L. Privitera:** None. **D. Furnari:** None. **S. Giunta:** None. **A.**