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**Interleukin-7 Receptor Knockout Mice Display Deficits In Habituation.**

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Cytokines are primarily known for their roles in inflammation and immunity; however, recent studies indicate that some cytokines (e.g. IL-1 $\alpha$ , IL-2, IL-6) influence behavior. We demonstrate that interleukin-7 receptor knockout (B6.129S7-Il7r<sup>tm1lmx</sup>/J) mice exhibit behavioral deficits in open field activity and habituation relative to C57BL6/J (B6) mice. In contrast, IL7<sup>-/-</sup> mice do not exhibit habituation deficits, indicating that a novel ligand interacts with the IL-7 receptor to elicit the observed behavior. The hippocampus is involved in learning and memory processes, e.g. habituation. Previous studies have indicated that hippocampal mossy fiber length correlates with some learning and memory phenotypes; however, our analysis of IL7R<sup>-/-</sup> and B6 mossy fibers revealed no significant differences. We performed global gene expression analyses of IL7R<sup>-/-</sup> and B6 hippocampi to determine if they differed in gene expression. We identified 66 probe sets that are differentially expressed between the two strains ( $p < 0.05$ ) by the Benjamini-Hochberg FDR, including genes implicated in synaptic plasticity, long-term potentiation, and neuronal migration. Our results suggest a novel role for the IL-7 receptor in behavior.