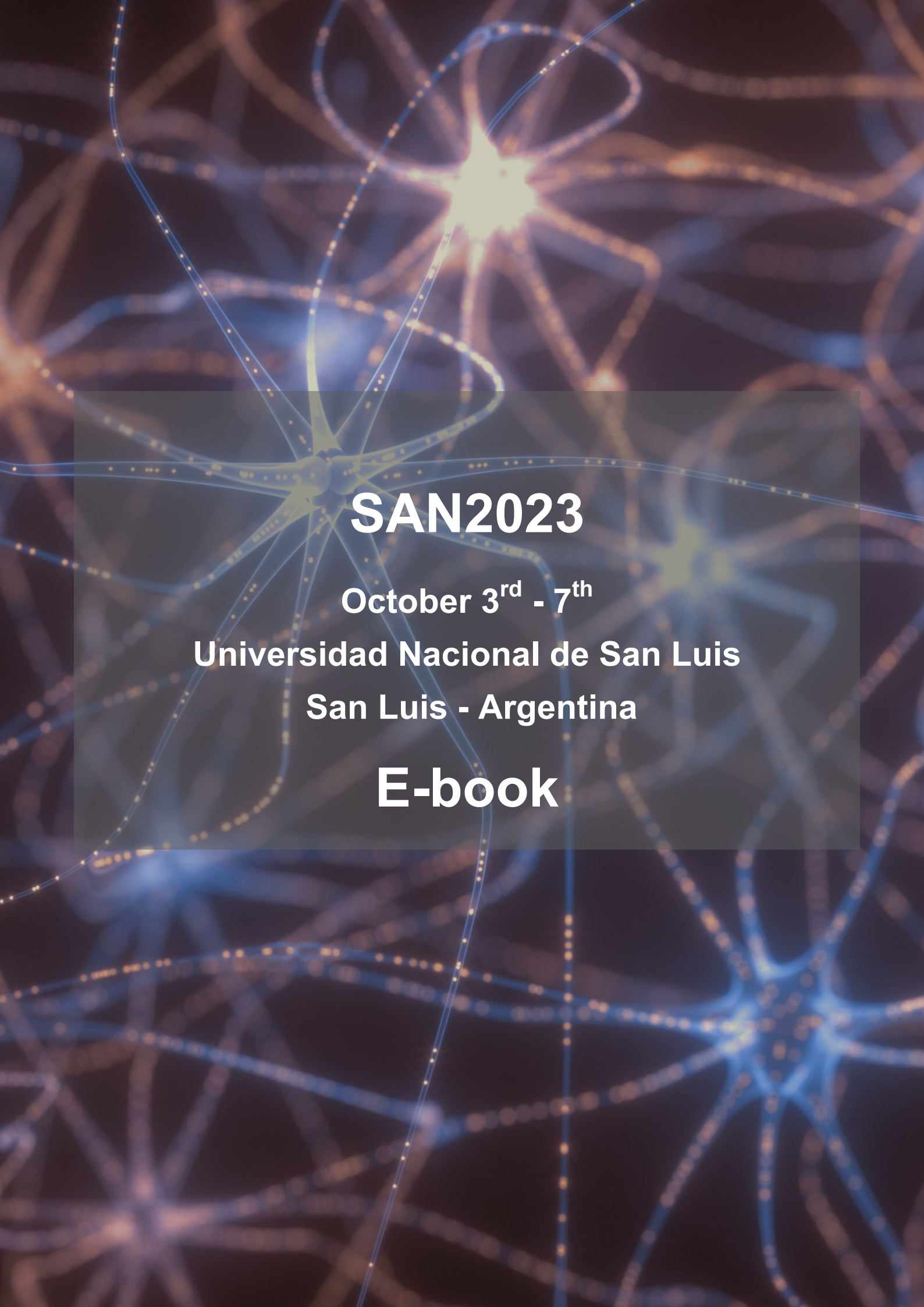

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160 | The ketogenic diet as an epigenetic modulator

Cognition, Behavior, and Memory

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The ketogenic diet (KD) is high in fat and very low in carbohydrates, leading to ketone bodies synthesis. They serve not only as an alternative energy source but also as epigenetic modulators. We administered the KD to B6 mice from P21 to P80, alongside a control group that was fed a regular diet. Behavioral tests were conducted to evaluate the effects of KD on sociability, recognition memory, and anxiety-like behavior. We obtained mRNA from hippocampus to evaluate gene expression related to neuronal excitability regulation (Kcnq2), oxidative stress (Foxo3, Sod2, Sod1) and memory processing (Chrna7). KD mice exhibited increased sociability. They showed a lower exploratory ratio during the NOR test, indicating a short-term recognition memory impairment. In the open field, KD mice displayed increased thigmotaxis, suggesting elevated anxiety-like behavior. In KD mice, Sod1 and Sod2 expression significantly increased, while and Kcnq2 and Chrna7 decreased. Our results suggest that altered Chrna7 expression due to KD may play a role in the observed impairment in the short-term recognition memory. The upregulation of Sod1 and Sod2 highlight KD´s potential role modulating oxidative stress pathways. Changes in Kcnq2 expression could modulate neuronal excitability. Coupled with increased antioxidant enzyme expression, this could contribute to the diet's neuroprotective effects and possibly underlie its therapeutic potential in ASD and epilepsy.