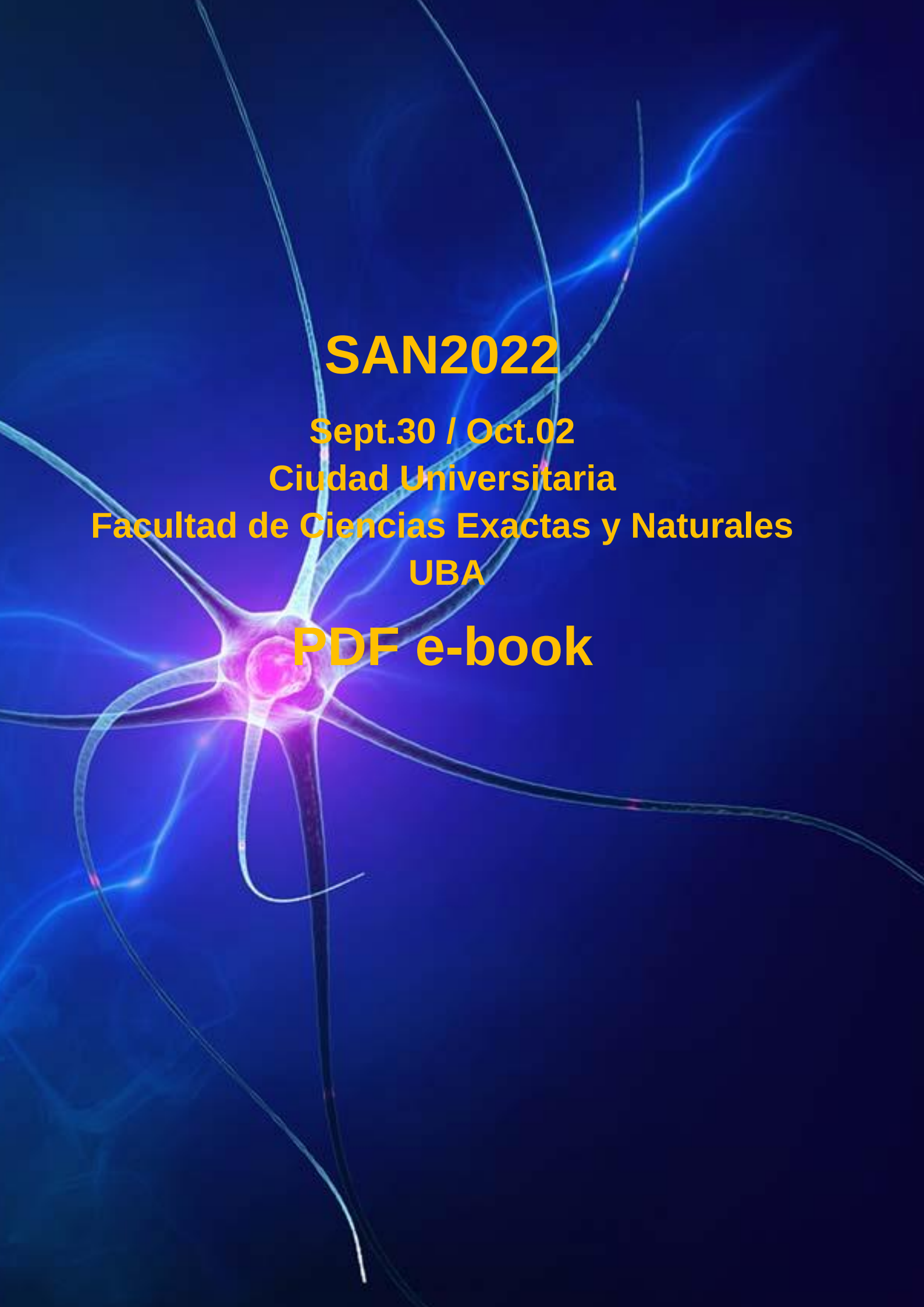

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04 | Detection of Prodromal Early Phenotypes and potential therapeutic window in a model of tauopathy

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Tau is a microtubule-associated protein predominantly expressed in neurons, which participates in microtubule polymerization and axonal transport. The alternative splicing of exon 10 (E10) in the Tau transcript produces protein isoforms with three (3R) or four (4R) microtubule binding repeats, which are expressed in equal amounts in the normal adult human brain. Here aimed to characterize early phenotypes of htau mice, at 3, 6 and 12 months old, to establish the time course of the progression state of tau pathology and identify the brain nuclei involved in these phenotypes. We performed behavioral tests to identify cognitive deficits, anxiety phenotypes, motor impulsivity and loss of behavioral inhibition. In addition, we assessed electrophysiological neuronal activity during the time course of pathological phenotypes, as well as molecular and histological markers. Finally, using an RNA trans-splicing strategy to modulate E10 inclusion (Sonia/ani) we demonstrate that local shifting of 3R to 4R tau into the striatum of htau mice improved some of the htau phenotypes. Together, our results suggest that tau isoforms imbalance could develop early phenotypes that can be identified to generate elaborate strategies to restore the isoform balance.