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| Título | Involvement of medial prefrontal cortex canonical Wnt/ β -catenin and non-canonical Wnt/Ca ²⁺ signaling pathways in contextual fear memory in male rat |
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The canonical Wnt/ β -catenin and non-canonical Wnt/Ca²⁺ signaling pathways, activated by Wnt proteins, have been related to several functions in central nervous system, including learning and memory. However, whether these signaling pathways are required in the medial prefrontal cortex (mPFC) for fear memory acquisition, consolidation and retrieval remains unclear. Thus, we decided to investigate the involvement of these signaling pathways in the acquisition, consolidation and retrieval of short-term (STM) and long-term (LTM) contextual fear conditioning (CFC) memory. For this, adult male Wistar rats underwent stereotaxic surgery to implant cannulae bilaterally into the mPFC. After recovery, the animals were submitted to a CFC paradigm (Tr: Training session - 2 min habituation, followed by 3 footshocks of 0.5 mA/2 sec at a 30 s interval). One hour later (STM) or 24h later (LTM), the animals were returned to the device for a 3-minute retention test without footshocks. The freezing time of the animals was evaluated. The administration of canonical Wnt/ β -catenin and non-canonical Wnt/Ca²⁺ signaling pathways inhibitors, DKK1 (100 ng per side) and SFRP1 (125ng per side), respectively, into the mPFC, occurred at different moments to evaluate STM and LTM acquisition, consolidation and retrieval of CFC memory. Control groups received sterile saline (Vehicle). We found that blocking canonical Wnt/ β -catenin and non-canonical Wnt/Ca²⁺ signaling pathways 15 min before or immediately after CFC training had no effect on STM and LTM of CFC, while their blockade 15 min before the retention test prevented the retrieval of STM and LTM of CFC. These results highlight the importance of the mPFC in fear memory retrieval demonstrating that both canonical Wnt/ β -catenin and non-canonical Wnt/Ca²⁺ signaling pathways participate in this process.