

P01-11 - SEROTONIN SERVES AS A MAINTENANCE FACTOR IN ADULT NEURAL STEM CELLS

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Here we studied serotonin (5-HT) as key regulator of adult neural stem cell (ANSC) proliferation, since 5-HT and drugs increasing 5-HT have been linked to increased neurogenesis in the dentate gyrus of the hippocampus. In our in-vitro model, we cultured neurospheres derived from mouse hippocampus in serum-free medium containing epidermal (EGF) and type-2 fibroblast growth factor (FGF2). Under the given conditions ANSC express both isoforms of tryptophane-hydroxylase (TPH). Consequently, ANSC production of 5-HT was confirmed by high pressure liquid chromatography (HPLC). Blocking TPH function by para-chlorophenylalanine (PCPA), ANSC proliferation was significantly reduced, which was rescued by adding exogenous 5-HT. Further, 5-HT action was conveyed to the ANSC predominantly by the serotonin receptor subtype 5-HT 1A, as we have shown by antagonising this receptor with WAY100635, a highly selective inhibitor of 5-HT 1A function. To a lesser extent, 5-HT 2C receptor modulated ANSC proliferation as seen by SB206553 driven blockade of this receptor subtype in co-culture experiments. Finally, we proved chemotactic properties of 5-HT on ANSC migration. Taken together, we claim a meaningful serotonergic impact on proliferation, survival, and migration of ANSC, which is mainly mediated by 5-HT 1A receptor.