P014 NMDA receptors and subunit-dependent actions: implications in synaptic transmission and plasticity of the hippocampus *in vitro*

Antonios Dougalis, Stephanie Burroughs, Paul L. Chazot and George Lees
Sunderland Pharmacy School, University of Sunderland, Sunderland, Tyne and Wear SR2 3SD, UK

Subpopulations of NMDA receptor complexes incorporating the NR2B or NR2C/D subunits exhibit distinct biophysical properties and, possibly, subserve specific functions in the mammalian hippocampus. Anti-NR2B and anti-NR2D/2C-like immunoreactivities display distinct profiles in the P21 rat hippocampus. We report here evidence that NR2B and NR2D/2C receptors differentially modulate the biophysical parameters of the hippocampal NMDA currents in P15-21 rats, with the latter limiting the duration of calcium influx, while the former its maximal peak. The NR2B subunit seems to be important in induction of LTP, but not LTD. In contrast, LTD is sensitive to the NR2D/2C antagonist (PPDA), which however, interestingly, also blocks LTP despite the lack of effects on the amplitude of the evoked current responses. The LTP IC_{50} value (1.2 μM) for CP-101,606 is relatively high for NR1/NR2B receptors, and may indeed reflect action on NR1/NR2A/NR2B receptors. These data suggest that NR2B and NR2C/D subunits are differentially involved in controlling the kinetics of intracellular calcium elevation during both LTP and LTD, which we speculate may be underpinned by distinct neuronal subunit topology.

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