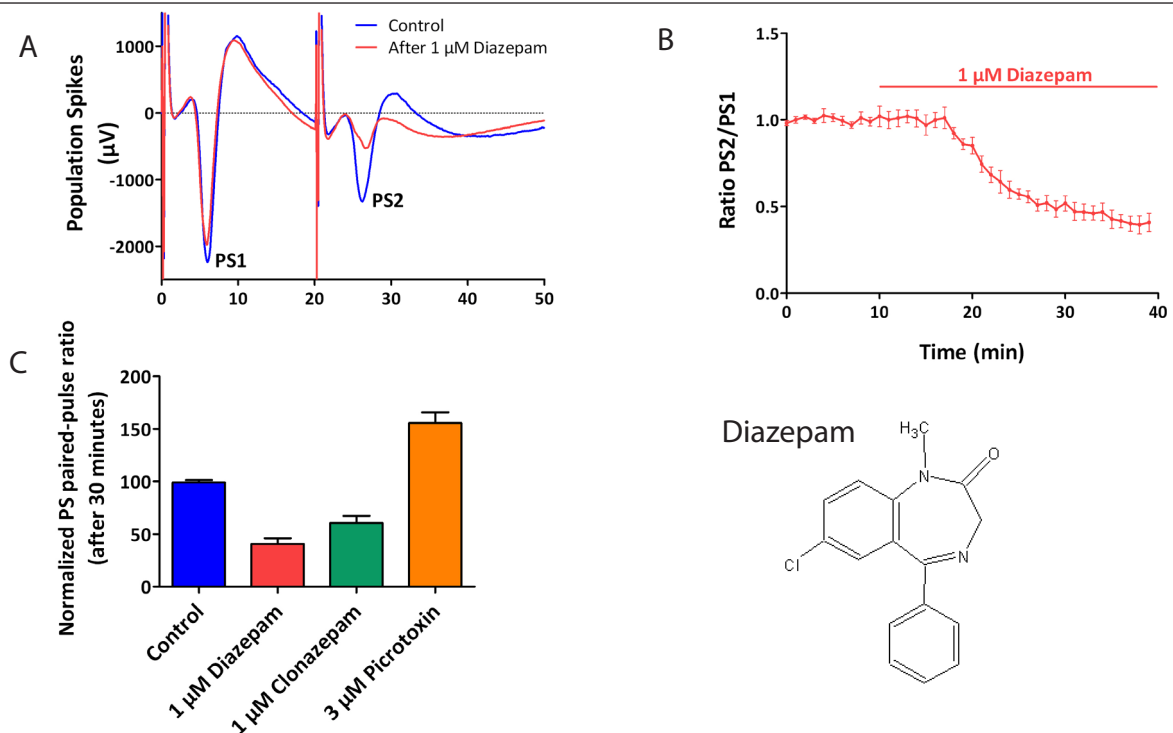


P-021 ● GABA_A-MEDIATED INHIBITION OF SYNAPTIC TRANSMISSION

● DIAZEPAM ● GABA_A RECEPTORS



BIOLOGY

The axons coming from pyramidal neurons of the hippocampal CA3 region (Schaeffer Collaterals, SC) make synapses on both dendrites of large CA1 pyramidal neurons and on small inhibitory interneurons. The paired-pulse inhibition (PPI) protocol, consisting of two stimuli applied at 20 ms intervals at SC, reveals GABA_A-mediated inhibition of synaptic transmission: as illustrated in the panel A, the second Population Spike (PS) amplitude is decreased compared to the first one since GABAergic interneurons mediating inhibition are still functioning when the second stimulus arrives in the CA1 region. Thus, GABA_A positive allosteric modulators (PAM) such as diazepam or clonazepam enhance PPI (and then decrease PS paired-pulse ratio, see panel A, B and C) whereas a GABA_A antagonist such as picrotoxin suppresses PPI (see panel C). Such a protocol allows to identify GABA_A receptor agonists, antagonists or PAMs in a physiological context.

PATHOLOGIES ASSOCIATED WITH GABA_A RECEPTORS

Anxiety, sleep disorders, schizophrenia, epilepsy.

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electrophysiological testing for the CNS