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13. ABSTRACT *(Maximum 200 words)*

The goal of this research program was to understand how acute and chronic ethanol administration disrupts synaptic transmission in the central nervous system. The overall hypothesis was that *ethanol depresses neurotransmission at neurotransmitter receptors by disrupting receptor-G protein interactions.* To this end, the influence of ethanol was measured on receptor-ligand binding (including the guanine nucleotide sensitivity of agonist binding), receptor control of the G protein cycle, and receptor regulation of specific signal transduction processes. Signal transduction processes studied included stimulation of phosphatidylinositol metabolism, release of arachidonic acid, control of adenylate cyclase, alteration of intracellular calcium concentration, and cell-cell adhesion. Chronic effects of ethanol on synaptic signaling processes, including receptor and G protein expression, were studied in brain tissue from rats treated with ethanol for 8-9 weeks, as well as in cell cultures treated for 48 hours. To gain a better understanding of the molecular action of ethanol on control of receptor expression, the promoters regions of muscarinic receptor genes were analyzed in detail. These studies revealed numerous specific actions of ethanol on synaptic signaling pathways. It is clear, however, that receptors differ in their sensitivity to ethanol and that system must be characterized separately.

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Robert S Aronstam 4/19/98

PI - Signature Date

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