The effects of various drugs in vitro on the metabolism of ethanol by alcohol dehydrogenase from yeast

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1. Desipramine, tranylcypromine, clonidine, acetaminophen, and diphenhydramine were examined to determine their effects on ethanol metabolism by interaction with alcohol dehydrogenase (ADH) derived from yeast.

2. ADH oxidizes ethanol to acetaldehyde via hydrogen transfer from ethanol to nicotinamide adenine dinucleotide (NAD$^+$), converting NAD$^+$ to its reduced form, NADH. The rate of ethanol metabolism was quantified in vitro using a dual beam spectrophotometer to monitor the rate of conversion of NAD$^+$ to NADH.

3. Desipramine, tranylcypromine and clonidine produced substantial inhibition of the rate of ethanol metabolism with IC$_{50}$ values (mmol/L) of 0.61, 0.53, and 0.48, respectively. Acetaminophen and diphenhydramine had no significant inhibitory effects on ADH activity.