

Behavioral characterization of acetaldehyde in mice

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Acetaldehyde, the first product of ethanol metabolism, has long been speculated to be involved in many of the behavioral effects of ethanol, although its precise role remains a matter of debate. However, most of the results supporting a role for acetaldehyde in ethanol's effects come from studies in which ethanol metabolism was pharmacologically manipulated, whereas the behavioral properties of acetaldehyde itself are still largely unknown. In the present studies, we have characterized the locomotor, hypnotic, anxiolytic and amnesic effects of both ethanol and acetaldehyde in C57BL/6J and CD1 mice. Several classical behavioral tests were used: the open field, the loss of righting reflex, the plus-maze, the place conditioning and the passive avoidance. The results show that acetaldehyde similarly to ethanol induces sedation and hypnotic effects at high doses. In addition, acetaldehyde displays potent amnesic effects in the passive avoidance test, suggesting that the first metabolite of ethanol might be critically involved in the memory-impairing effects of ethanol. However, in contrast to ethanol, acetaldehyde does not show anxiolytic properties in the plus-maze. In a second part of the present studies, acetaldehyde contribution to ethanol's behavioral effects was investigated by using several inhibitors of ethanol metabolism (3-amino-1,2,4-triazole, a catalase inhibitor, and disulfiram, an aldehyde dehydrogenase inhibitor). Overall, the present results suggest that acetaldehyde is involved in some of ethanol's behavioral effects (amnesia, locomotor depression, sedation) but not in others (in particular anxiolysis).