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Relative Reactivities of Histamine and Indoleamines with Acetaldehyde

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Relative reactivities of histamine and indoleamines such as tryptamine, 5-hydroxytryptamine and 5-methoxytryptamine with acetaldehyde (AA) under physiological conditions were investigated. AA was found to have much higher reactivity towards histamine than towards indoleamines. For example, when a reaction mixture of AA (1 mM) and histamine or tryptamine (5 mM) in 0.1 M phosphate buffer (pH 7.4) was incubated at 37 ℃ for 24 h, AA decreased by 11 % in the case of tryptamine, while in the case of histamine, it decreased 88 %. In addition, the reaction product of AA with histamine was investigated. Mixtures of a fixed amount of histamine (5 mM) and various amounts of AA (1 - 20 mM) in phosphate buffer (pH 7.4) were incubated for 5 h at 37 ℃. In all cases, only one product, 4-methylspinaceamine (4-MSPA), was observed. The yield of 4-MSPA was in approximate agreement with the losses of histamine and AA, indicating that the loss of histamine caused by the reaction of AA was quantatively converted to 4-MSPA. These results show that the reaction of AA with histamine easily takes place to produce 4-MSPA in an aqueous medium close to physiological conditions.