ACETALDEHYDE (Group 2B)

A. Evidence for carcinogenicity to humans (*inadequate*)

In a survey of chemical plants (without prior hypothesis) in the German Democratic Republic, nine cancer cases were found in a factory where the main process was dimerization of acetaldehyde and where the main exposures were to acetaldol, acetaldehyde, butyraldehyde, crotonaldehyde and other higher, condensed aldehydes, as well as to traces of acrolein (see p. 78). Of the cancer cases, five were bronchial tumours and two were carcinomas of the oral cavity. All nine patients were smokers. The relative frequencies of these tumours were reported to be higher than those expected in the German Democratic Republic[1]. The study is inconclusive because of mixed exposure, the small number of cases and the poorly defined exposed population.

B. Evidence for carcinogenicity to animals (*sufficient*)

Acetaldehyde was tested for carcinogenicity in rats by inhalation and in hamsters by inhalation and by intratracheal instillation. It produced tumours of the respiratory tract following its inhalation, particularly adenocarcinomas and squamous-cell carcinomas of the nasal mucosa in rats[1,2] and laryngeal carcinomas in hamsters[1]. In hamsters, it did not result in an increased incidence of tumours following intratracheal instillation[1]. Inhalation of acetaldehyde enhanced the incidence of respiratory-tract tumours induced by intratracheal instillation of benzo[*a*]pyrene in hamsters[1].

C. Other relevant data

No data were available on the genetic and related effects of acetaldehyde in humans.

Acetaldehyde increased the incidence of sister chromatid exchanges in bone-marrow cells of mice and hamsters treated *in vivo* and induced chromosomal aberrations in rat

embryos exposed *in vivo*. It induced DNA cross-links, chromosomal aberrations and sister chromatid exchanges in human cells *in vitro* and chromosomal aberrations, micronuclei and sister chromatid exchanges in cultured rodent cells. It induced chromosomal aberrations, micronuclei and sister chromatid exchanges in plants and DNA damage and mutation in bacteria. Acetaldehyde induced cross-links in isolated DNA[3].

References

[1]IARC Monographs, *36*, 101-132, 1985

[2]Woutersen, R.A., Appelman, L.M., van Garderen-Hoetmer, A. & Feron, V.J. (1986) Inhalation toxicity of acetaldehyde in rats. III. Carcinogenicity study. *Toxicology*, *41*, 213-231

[3]*IARC Monographs, Suppl. 6*, 21-23, 1987