

Review Summary of the National Institute of Environmental Health Sciences (NIEHS/NTP) RoC Review Committee (RG1)

Nomination: 1-Amino-2,4-dibromoanthraquinone (ADBAQ)

Review committee: RG1

Review Date: 2/26/02

Major Issues Discussed

◆ Animal data

The committee felt that the NTP two-year feeding study provided strong and compelling evidence for multi-site carcinogenicity of ADBAQ in rats and mice. In male and female mice, significantly increased incidences of benign and malignant liver and forestomach tumors were observed. The incidences of lung alveolar/bronchiolar adenoma were also significantly increased in dosed males and females. In both male and female rats ADBAQ produced increased incidences of neoplasms of the liver, large intestine, kidney and urinary bladder. The Committee concluded that these data were sufficient to establish the carcinogenicity of ADBAQ in rats and mice.

◆ Human data

There have been no studies evaluating human cancer and exposure specifically to ADBAQ. However, two populations exposed to anthraquinone, anthraquinone dyes and anthraquinone dye intermediates have been studied, one in Scotland and one in New Jersey.

The Scottish population was described in one published paper, which reported significant excess cancer mortality for the esophagus among engineering workers and for the prostate in one particular process area. The New Jersey population was described in four published studies: cohort, follow-up of the cohort and two case-control, which reported increased mortality from lung and central nervous system cancer. The increase in lung cancer mortality was significant and not apparently attributable to confounding.

The Committee concluded that methodological limitations of the two studies (including low power to detect risks and inadequate exposure information) precluded the attribution of the observed carcinogenic effects to ADBAQ. However, the same limitations prevent the studies from ruling out the possibility of elevated risk.

◆ Human Exposure

The main source of ADBAQ exposure is dermal exposure in an occupational setting. Although no occupational exposure specific for ADBAQ has been reported, there is a cohort (> 3,000 workers) of New Jersey employees at a dye manufacturing plant using anthraquinone dyes. ADBAQ was found to be available from two vendors in the United States. U.S. production of vat dyes totaled 14,000,000 kg (30,800,000 lbs.) in 1991. The Committee concluded that ADBAQ met the "significant human exposure" criteria for possible listing in the Report on Carcinogens.

Recommendation:

Recommend that 1-Amino-2,4-dibromoanthraquinone to be listed as *reasonably anticipated to be a human carcinogen* based primarily on sufficient evidence in animals.

Votes 8yes 0/no