

## COAL-TARS (Group 1)

### A. Evidence for carcinogenicity to humans (*sufficient*)

There have been a number of case reports of skin cancer in patients who used tar ointments for a variety of skin diseases<sup>1,2</sup>. A mortality analysis in the UK from 1946 showed a greatly increased scrotal cancer risk for patent-fuel workers. Furthermore, a large number of case reports describe the development of skin (including the scrotum) cancer in workers exposed to coal-tars or coal-tar pitches (see p. 174)<sup>1</sup>. Several epidemiological studies have shown an excess of lung cancer among workers exposed to coal-tar fumes in coal gasification and coke production<sup>3,4</sup>. One study showed a small excess of bladder cancer in tar distillers and in patent-fuel workers. An elevated risk of cancer of the renal pelvis was seen in workers exposed to 'petroleum or tar or pitch'<sup>1</sup>. One study of millwrights and welders exposed to coal-tars and coal-tar pitch in a stamping plant showed significant excesses of leukaemia and of cancers of the lung and digestive organs<sup>5</sup>.

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

Coal-tars from blast furnaces, coke ovens and coal gasification plants, as well as pharmaceutical coal-tars, were tested for carcinogenicity by skin application in mice, producing skin tumours. Pharmaceutical coal-tars and tars from coal gasification plants also produced skin tumours when applied to the ears of rabbits. Pharmaceutical coal-tars applied to the skin of rats produced lung tumours but not skin tumours. Inhalation of tar from coke ovens produced benign and malignant lung tumours in mice and rats and skin tumours in mice<sup>1,3,4</sup>.

### C. Other relevant data

An increased frequency of chromosomal aberrations was observed in peripheral lymphocytes of coal-tar workers, both smokers and nonsmokers. Extracts of urine from patients undergoing combined treatment with coal-tar preparations and ultraviolet light were mutagenic to *Salmonella typhimurium*<sup>6</sup>.

Coal-tar induced transformation of Syrian hamster embryo cells. Samples of therapeutic coal-tar, extracts of coal-tar shampoos, an industrial coal-tar and vapours emitted from a coal-tar sample at 37°C were mutagenic to *S. typhimurium* in the presence of an exogenous metabolic system<sup>6</sup>.

### References

- <sup>1</sup>IARC Monographs, 35, 83-159, 1985
- <sup>2</sup>Stern, R.S., Scotto, J. & Fears, T.R. (1985) Psoriasis and susceptibility to nonmelanoma skin cancer. *J. Am. Acad. Dermatol.*, 12, 67-73
- <sup>3</sup>IARC Monographs, 34, 65-99, 1984
- <sup>4</sup>IARC Monographs, 34, 101-131, 1984
- <sup>5</sup>Silverstein, M., Maizlish, N., Park, R. & Mirer, F. (1985) Mortality among workers exposed to coal tar pitch volatiles and welding emissions: an exercise in epidemiologic triage. *Am. J. public Health*, 75, 1283-1287
- <sup>6</sup>IARC Monographs, Suppl. 6, 186, 1987