7-Methylbenz(*a*)anthracene

7-Methylbenz(*a*)anthracene, also called 10-methyl-1,2-benzanthracene, is a product of incomplete combustion. Sources include oil refinery emissions, gasoline exhaust, and cooking emissions. This polycyclic aromatic hydrocarbon is present in ambient air.

7-Methylbenz(*a*)anthracene passed the animal data screen, underwent a preliminary toxicological evaluation, and is being brought to the Carcinogen Identification Committee for consultation. This is a compilation of the relevant studies identified during the preliminary toxicological evaluation.

Epidemiological data

No cancer epidemiology studies were identified.

Animal carcinogenicity data

- Subcutaneous injection studies in mice
    - Female albino Sutter mice (single injection): Miller and Miller (1960, Table 3, Experiment No. 2)
        - *Increase in injection site sarcoma (by pairwise comparison)*
    - Female albino Taconic Farms mice (single injection): Miller and Miller (1960, Table 3, Experiment No. 3)
        - *Increase in injection site sarcoma (by pairwise comparison)*
    - Female albino Taconic Farms mice (single injection): Miller and Miller (1963, Chart 3)
        - *Increase in injection site sarcoma (by pairwise comparison)*

- Subcutaneous injection studies in rats
    - Male and female F344 rats (one-time bilateral injections): Dunning and Curtis (1960)
        - *Increases in fibrosarcoma or sarcoma (combined) in males and females (by pairwise comparison)*
    - Male albino Holtzman rats (single injection): Miller and Miller (1960, Table 3)
        - *Increase in injection site sarcoma (by pairwise comparison)*
    - Male albino Holtzman rats (single injection): Miller and Miller (1963, Chart 4)
        - *Increase in injection site sarcoma (by pairwise comparison)*

- Dermal studies in mice
    - Female albino Sutter mice (twice a week for 20 weeks and observed for a total of 15 months): Miller and Miller (1960, Table 1)
        - *Increase in skin carcinoma (by pairwise comparison)*

    - Female albino Tacomic Farms mice (twice a week for 20 weeks and observed for a total of 13 or 15.5 months): Miller and Miller (1963, Chart 1)
        - *Increase in skin carcinoma (by pairwise comparison)*

- Tumor-initiating studies in mice
    - Female albino Sutter mice (single dermal application, followed six weeks later with dermal applications of 0.2% croton oil (twice a week for eight months)): Miller and Miller (1960, Table 2, Experiment No. 1)
        - *Increase in skin papillomas (by pairwise comparison)*
    - Female albino Taconic Farms mice (single dermal application, followed three weeks later with dermal applications of 0.5% croton oil (twice a week for eight months)): Miller and Miller (1960, Table 2, Experiment No. 2)
        - *Increase in skin papillomas (by pairwise comparison)*
    - Female albino Taconic Farms mice (single dermal application, followed one week later with dermal applications of 0.5% croton oil (twice a week for 10 months)): Miller and Miller (1960, Table 2, Experiment No. 3)
        - *Increase in skin carcinomas and papillomas (combined) (by pairwise comparison)*
    - Female albino Taconic Farms mice (single dermal application, followed one week later with dermal applications of 0.5% croton oil (twice a week for 23 or 38 weeks)): Miller and Miller (1963, Chart 2)
        - *Increase in skin papillomas (by pairwise comparison)*
    - Female CD-1 mice (single dermal application, followed one week later with dermal applications of 12-O-tetradecanoylphorbaol-13-acetate (twice a week for 21 weeks): Wislocki *et al*. (1982)
        - *Increase in skin papillomas (by pairwise comparison and trend)*

Other relevant data

- Genotoxicity
    - Compilation: GENE-TOX (1995)
        - *Salmonella typhimurium* reverse mutation assays *(positive)*
        - Chinese hamster lung V79 cell forward mutation assays at the HPRT (hypoxanthine phosphoribosyltransferase) and ouabain loci *(positive)*
        - Sister chromatid exchange *in vitro (positive)*
        - Cell transformation assays in Syrian hamster embryo cells and mouse prostate cells *(positive)*

- Structure activity considerations
    - Structurally similar to 7,12-dimethylbenz(*a*)anthracene, a potent carcinogen listed under Proposition 65.
    - 7-Methylbenz(*a*)anthracene is the most potent of 12 monomethylbenz(*a*)anthracenes tested in a two-stage initiation-promotion assay in female CD-1 mice: Wislocki *et al.* (1982)

Reviews or compilations

- CCRIS (1991)

References[1]

Chemical Carcinogenesis Research Information System (CCRIS, 1991) http://toxnet.nlm.nih.gov (accessed on April 2, 2009).

Dunning WF and Curtis MR (1960). Relative carcinogenic activity of monomethyl derivatives of benz[*a*]anthracene in Fischer Line 344 rats. *Journal of the National Cancer Institute* **25**:387-391.

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Miller EC and Miller JA (1960). The carcinogenicity of fluoro derivatives of 10-methyl-1,2-benzanthracene. I. 3- and 4'-monofluoro derivatives. *Cancer Research* **20**:133-137.

Miller JA and Miller EC (1963). The carcinogenicities of fluoro derivatives of 10-methyl-1,2-benzanthracene. II. Substitution of the K region and the 3'-, 6-, and 7-positions. *Cancer Research* **23**:229-239.

Wislocki PG, Fiorentini KM, Fu PP, Yang SK, Lu AYH (1982). Tumor-initiating ability of the twelve monomethylbenz[*a*]anthracenes. *Carcinogenesis* **3**:215-217.

[1] Excerpts or the complete publication have been provided to members of the Carcinogen Identification Committee, in the order in which they are discussed in this document.