Omeprazole and Its Salts

Omeprazole is a proton pump-inhibiting drug available either as a prescription medication (e.g., Prilosec®), or over-the-counter to treat “acid reflux disease.” It is a benzimidazole compound. This drug, which may be administered as a salt (e.g., omeprazole magnesium), blocks gastric acid secretion in the stomach. There is widespread exposure to people who take this drug.

Omeprazole and its salts passed the animal data screen, underwent a preliminary toxicological evaluation, and are 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

- Case reports
  - Esophageal cancer: Cary et al. (1993)
  - Gastric carcinoid tumor: Dawson and Manson (2000); Daniels (2001)

Animal carcinogenicity studies

- Long-term studies in rats
  - Two-year gavage studies in male and female Sprague-Dawley rats: Havu (1986)
    - Increased incidence of rare gastric stomach neuroendocrine cell tumors in rats of both sexes
    - Increased incidence of rare gastric stomach neuroendocrine tumors in rats of both sexes
  - Female rats (one-year treatment period + one year observation): FDA (2005)
    - No treatment-related tumor findings
  - One-year studies in male and female Sprague Dawley rats: FDA (2005)
    - Brain astrocytomas found in some male rats

- Long-term studies in mice
  - 78-week studies in male and female CD-1 mice: Havu (1986)
    - No treatment related tumor findings

- Transgenic mouse studies
  - 26-week transgenic p53(+/−) mouse study: FDA (2005)
    - No treatment-related tumor findings
Other relevant data

- Genotoxicity
  - Binding to rat DNA *in vivo*: Phillips et al. (1992)

- Mechanistic considerations regarding neuroendocrine tumors of the stomach:
  Diaz et al. (1990); Poynter and Selway (1991); Ryberg et al. (1989); Powers et al. (1995, pp. 312-313)

- Structure activity considerations
  - Similarity with other benzimidazole proton pump inhibitors, including pantoprazole and rabeprozole, which also induce tumors in animals.
  - Omeprazole, pantoprazole and rabeprozole all induce rare gastric stomach neuroendocrine cell tumors in the gastric fundus in rats.

Review

- FDA (2005)

References


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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.


