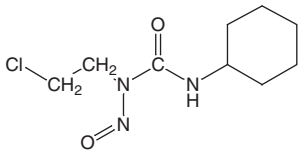
1-(2-Chloroethyl)-3-Cyclohexyl-1-Nitrosourea
CAS No. 13010-47-4

Reasonably anticipated to be a human carcinogen
First Listed in the *Fourth Annual Report on Carcinogens* (1985)



Carcinogenicity

1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea (CCNU) is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC 1981, 1982, 1987). When administered by intraperitoneal or intravenous injection, 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea induced lung carcinomas in rats of both sexes. When the compound was administered by intraperitoneal injection, an increase in the incidence of lymphosarcomas was reported in mice of both sexes (IARC 1981, 1982, 1987). Application of the compound to the skin of mice did not induce skin tumors, but the duration of the experiment was considered inadequate for the results of this study to be relevant (IARC, 1981, 1987).

No adequate data were available to evaluate the carcinogenicity of 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea in humans (IARC 1982). In several reported cases, cancer patients who received the compound developed leukemia. With one exception, all of these patients had also received other cytotoxic agents and/or irradiation (IARC 1981,1982).

Properties

1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea is a yellow powder that is soluble in ethanol, sodium hydroxide, and hydrogen chloride, but is practically insoluble in water (HSDB 2000). It is stable when stored at room temperature away from heat and moisture (Bristol 1990). This drug undergoes spontaneous, nonenzymatic degradation to form 2-chloroethyl carbonium ions that can alkylate DNA and organic isocyanates that react with cellular proteins (Calabresi and Parks 1985).

Use

1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea is an antineoplastic agent. The compound has had limited use since the early 1970s in the treatment of Hodgkin's disease and various solid tumors. These include primary and metastatic brain tumors, colorectal tumors, and certain pulmonary malignancies. It is usually used in conjunction with other antineoplastic drugs (IARC 1981).

Production

Current U.S. production, import, and export data for 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea were not available; however, one manufacturer and two suppliers were identified (HSDB 2000, Chem Sources 2001). 1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea was first synthesized in the United States in 1966 (IARC 1981).

Exposure

Humans may be exposed to 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea through inhalation, dermal contact, and ingestion. Cancer patients are exposed to the compound when it is used as an antineoplastic agent. The recommended dose for adults and children is 130 mg/m^2 body surface, given as a single oral dose every 6 weeks (IARC 1981). The standard formulations include 10, 40, and 100 mg capsules (HSDB 2000). Potential occupational exposure may occur during the production, formulation, packaging, and administration of the pharmaceuticals. No estimate has been made on the number of people potentially exposed to 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea.

Regulations

CPSC

Any orally administered, prescription drug for human use requires child-resistant packaging

FDA

1-(2-Chloroethyl)-3-cyclohexyl-1-nitrosourea is a prescription drug subject to labeling and other requirements

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