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Cytotoxic Antibiotics

Updated: September 10, 2021.

OVERVIEW

Several naturally occurring compounds with antibiotic activity also have potent antitumor activity and were developed as anticancer agents. These cytotoxic antibiotics are often grouped together, even though they have diverse mechanisms of action, widely different indications, a range of efficacies and distinctive toxicities. The cytotoxic antibiotics in current use in the United States include (with trade name and year of approval): bleomycin (Blenoxane, 1973), dactinomycin (Cosmegen, 1964), daunorubicin (Cerubidine, 1979), doxorubicin (Adriamycin, 1974), epirubicin (Ellence, 1999), idarubicin (Idamycin, 1990), plicamycin (previously known as mithramycin, still experimental), mitomycin (Mutamycin, 2002) and mitoxantrone (Novantrone, 1987). A discussion of the mechanism of action, current use and hepatotoxicity, along with structural information and references of these drugs, are provided for each agent individually. The anthracycline antibiotics include daunorubicin, doxorubicin, epirubicin and idarubicin (which are discussed together) and mitoxantrone, which is an anthracycline analog and discussed separately.

Most of the cytotoxic antibiotics used in cancer chemotherapy have been implicated in cases of drug induced liver injury, generally associated with the use of high doses and with either direct hepatocellular injury or sinusoidal obstruction syndrome (from direct sinusoid cell injury). Because they are typically used in combination with other antineoplastic agents, it is often difficult to identify which is responsible for the liver injury.

Drug Class: Antineoplastic Agents

The cytotoxic antibiotics discussed in LiverTox include:

- Bleomycin
- Dactinomycin
- Daunorubicin
- Doxorubicin
- Epirubicin
- Idarubicin
- Mitomycin
- Mitoxantrone
- Plicamycin
- Valrubicin