

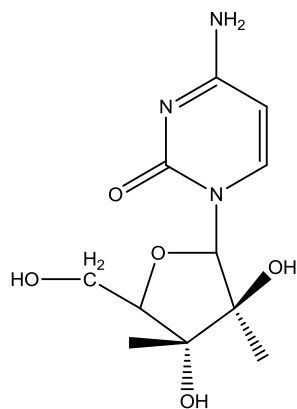
## Cancer agents - Problem set #2

1. Methotrexate (MTX) is a useful anti-cancer agent. What type of anti-cancer agent is it? In other words, what pathway does it interfere with?

What enzyme does it specifically inhibit? If too much MTX is administered, what agent can be given to as an antidote?

MTX is trapped within cells by formation of these metabolites. What are these metabolites called?

2. Cytarabine (AraC) is shown below. What kind of anti-cancer agent is it? Explain its mechanism of action (MOA) and indicate using arrows the atom(s) in the molecule that make it effective an anti-cancer drug. Name a cancer for which AraC is used.



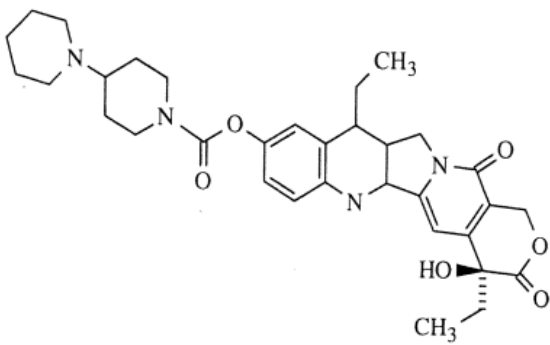
Cytarabine

3. The structure below is a very important agent for treating colorectal cancer. What is the name of this agent?

It is a prodrug. What is the active metabolite?

Show using a line what bond is broken to form the active metabolite or draw the metabolite.

Explain the important consideration about the metabolism and clearance of the active metabolite.



4. 6-Mercaptopurine (6-MP) is shown below as the top left structure. Also shown is a metabolic pathway whereby 6-MP is converted to a molecule responsible for its anti-cancer activity. Draw a circle around this metabolite. In addition, metabolic pathways are shown that are not involved in its anti-cancer activity and only contribute to elimination of 6-MP. Draw squares around these molecules. Which pathway involves a polymorphism? Name it.

