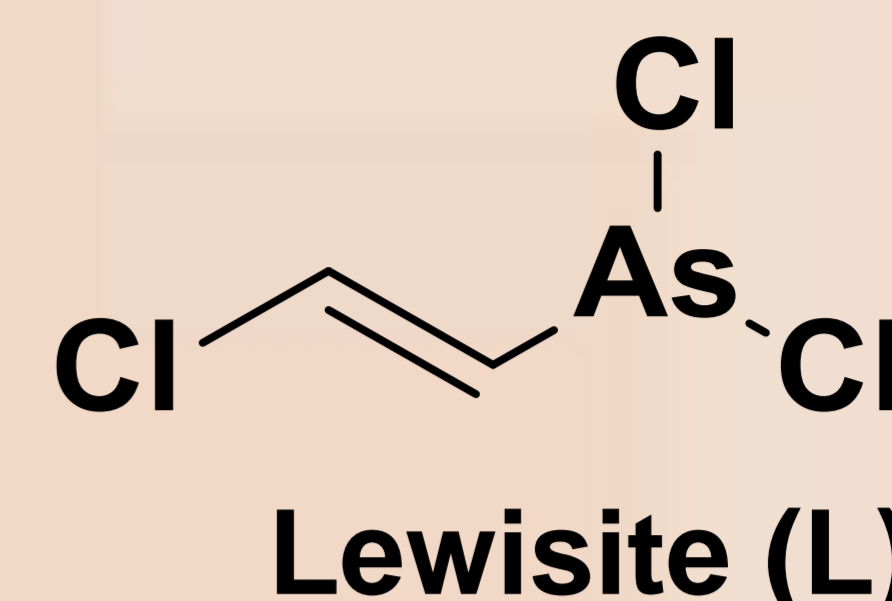
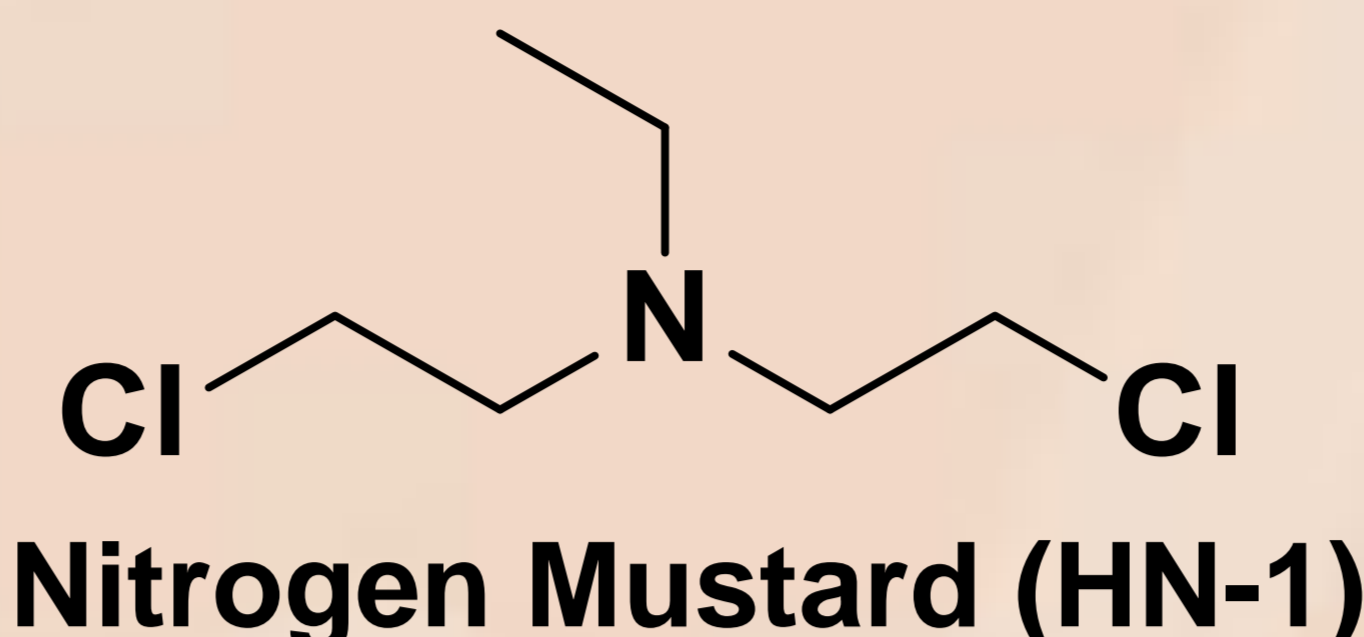
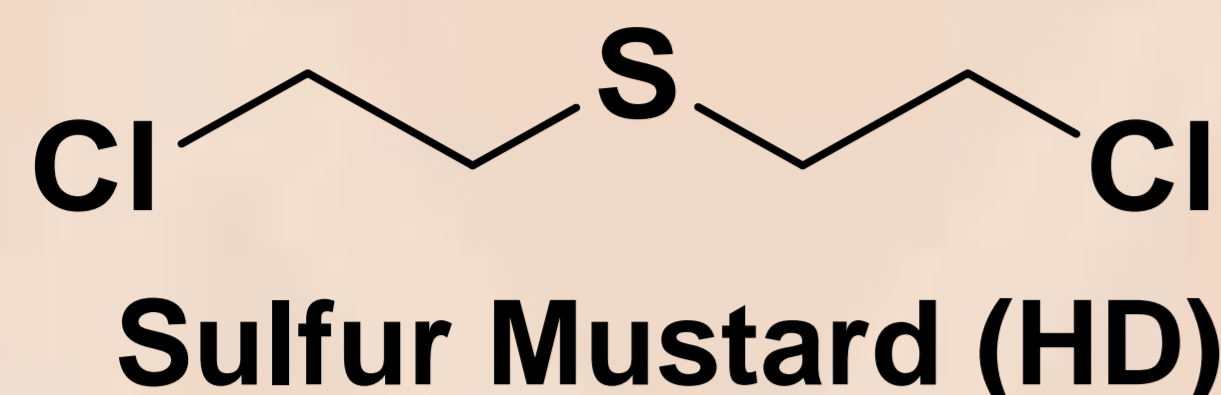


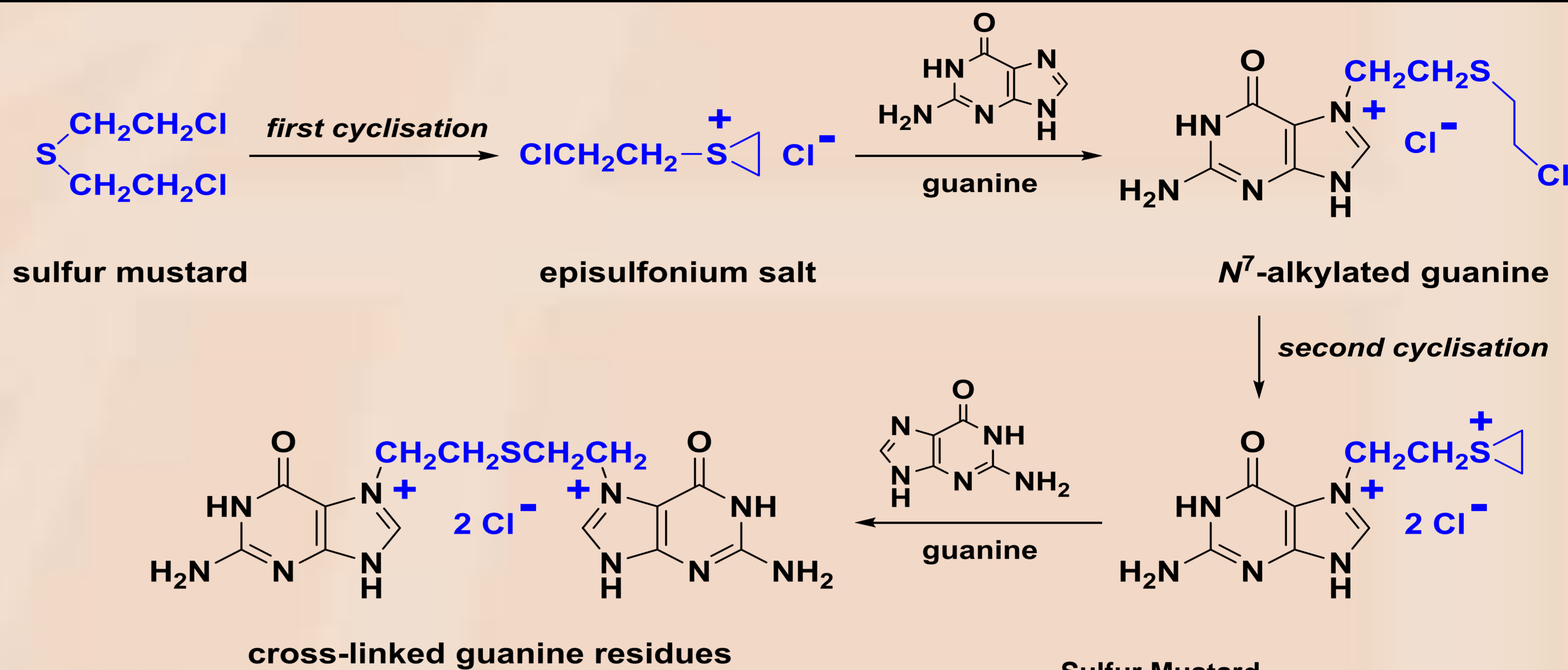
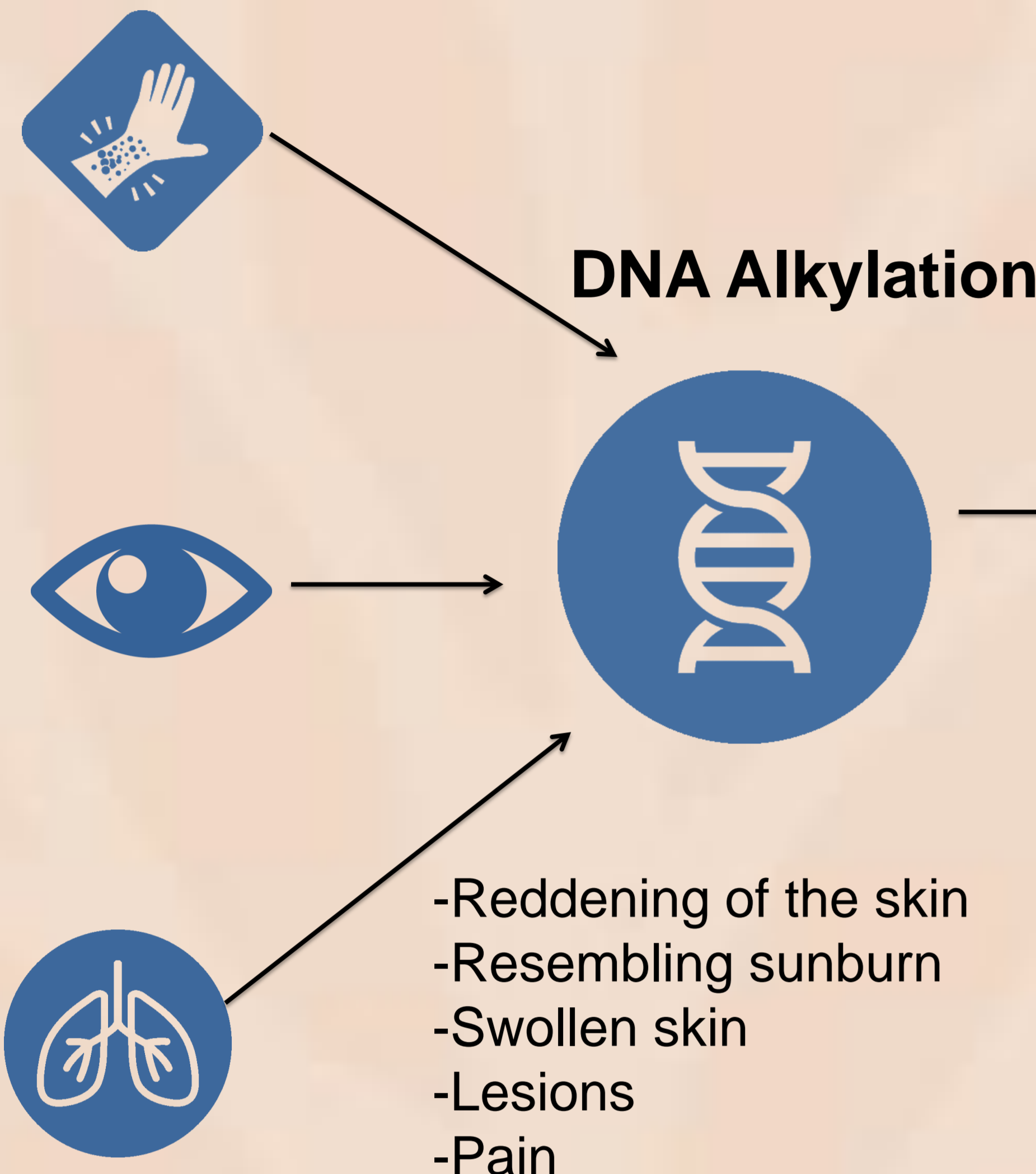


Blister Agents and their Countermeasures

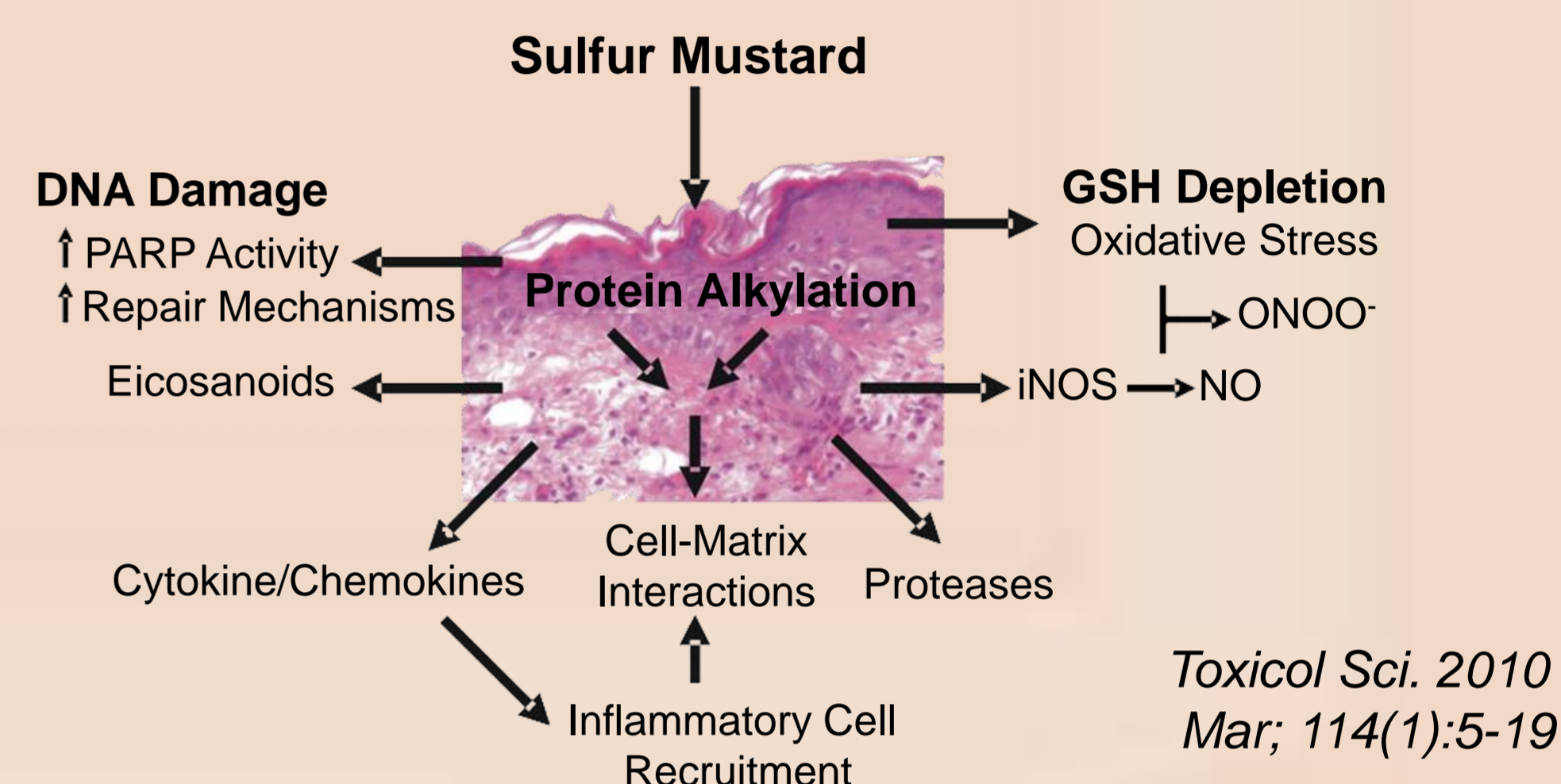
Examples of stockpiled blister agents:



Effects of sulfur mustard



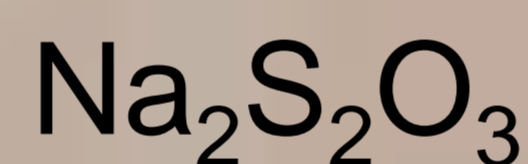
Blister agents alkylate biological molecules such as nucleic acids, proteins and cellular membrane components. This results in a cascade of complications. Alkylation and cross linking of DNA (illustrated above) can lead to a risk of cancer.



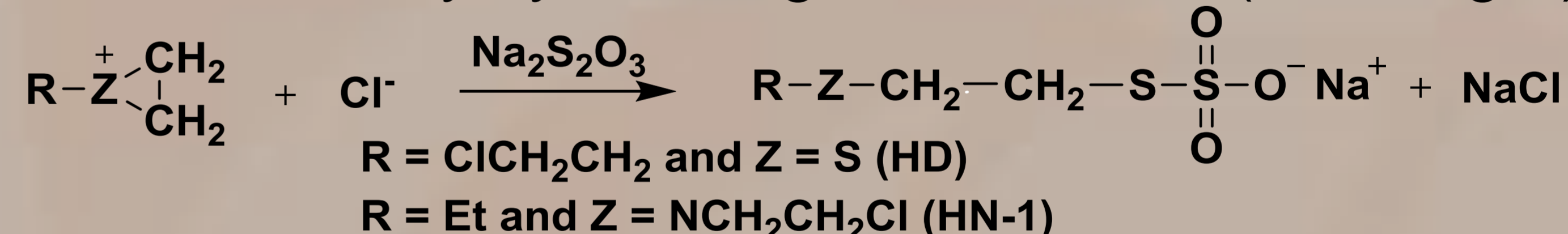
Countermeasures including supportive measures

Effect

Sodium Thiosulfate (administered intravenously)



Prevents lethality by reacting with mustard (scavenger).



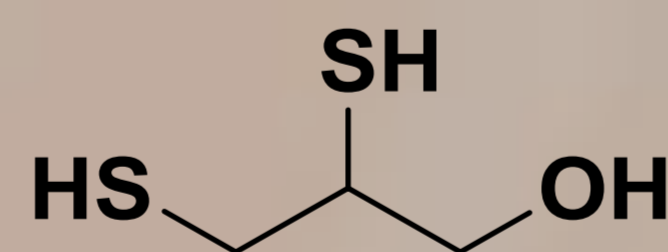
Reactive Skin Decontamination Lotion - RSDL

A Mixture of Dekon 139 and 2,3, butanedione monoxime (DAM) in a polyethylene glycol monomethyl ether (MPEG) and water solvent system (also works as a countermeasure against organophosphorus agents). Commercially available, www.rSDL.com.

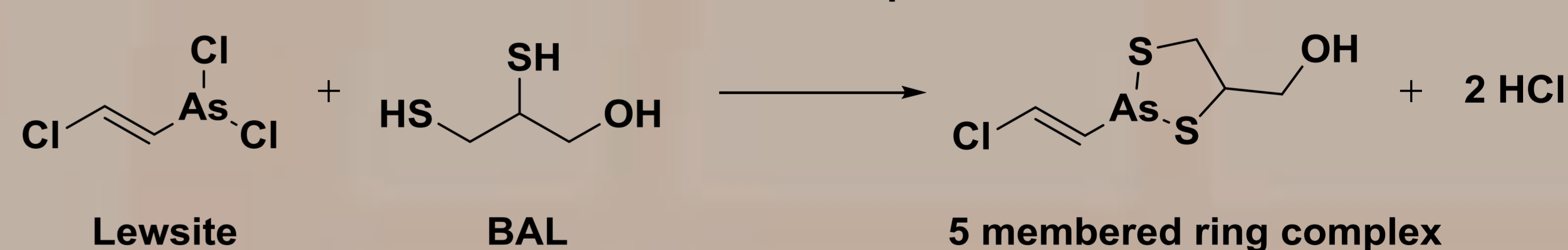


Prevents dermal absorption and rapidly neutralizes the vesicant chemical.

BAL (British Anti Lewisite) (administered intramuscularly)

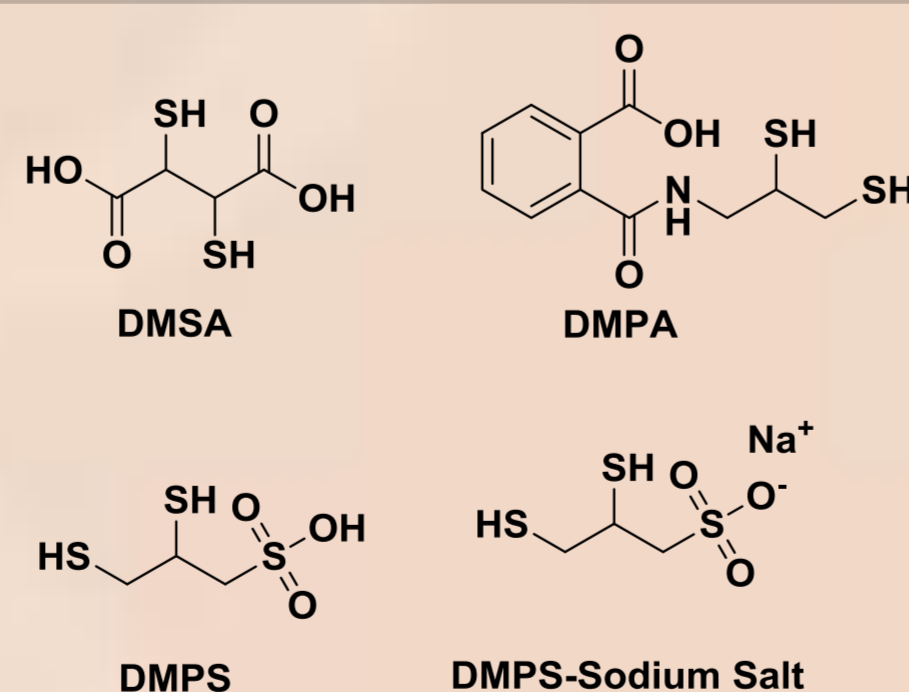


Chelating agent that binds to Lewisite to form a water soluble complex.

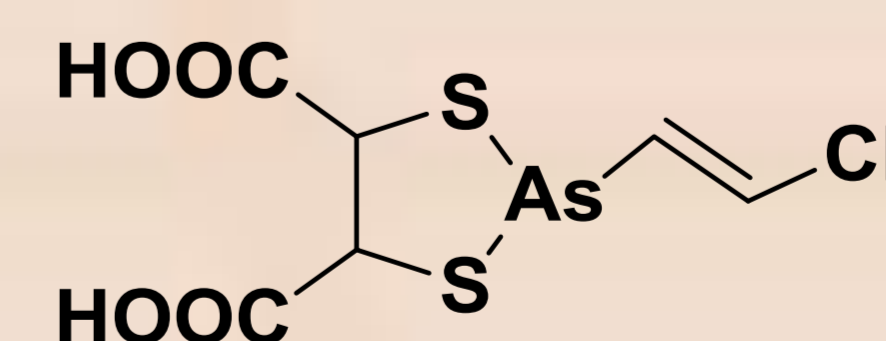


DMSA
DMPS
DMPA

DMPS-Sodium Salt (used for Lewisites)

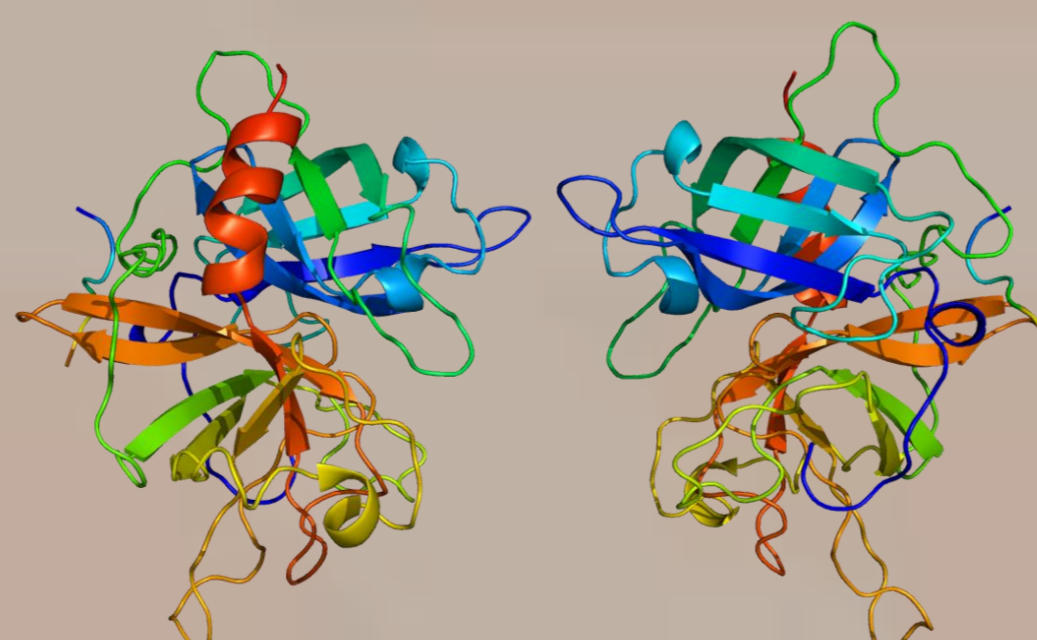


These chelating agents bind to Lewisite to form water soluble complexes.



Tissue plasminogen activator (tPA) (Experimental therapeutic, administered intravenously)

Am J Respir Cell Mol Biol. 2013 Apr; 48(4): 439-447



Diminishes airway obstructive fibrin-containing casts; this improves clinical respiratory distress, pulmonary gas exchange and tissue oxygenation.

Sodium Hypochlorite

Can be used as a skin decontaminant. However, it is not a recommended treatment due to caustic properties.



Oxidizes (and inactivates) blister agents.

