

Researchers discover fast-acting cyanide antidote

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University of Minnesota Center for Drug Design and Minneapolis VA Medical Center researchers have discovered a new fast-acting antidote to cyanide poisoning. The antidote has potential to save lives of those who are exposed to the chemical – namely firefighters, industrial workers, and victims of terrorist attacks.

Current cyanide antidotes work slowly and are ineffective when administered after a certain point, said Steven Patterson, Ph.D., principal investigator and associate director of the University of the Minnesota Center for Drug Design.

Patterson is developing an antidote that was discovered by retired University of Minnesota Professor Herbert Nagasawa. This antidote works in less than three minutes – meeting the United States Department of Defense “three minute solution” standard. The research will be featured in the Dec. 27, 2007 issue of the *Journal of Medicinal Chemistry*.

“It’s much, much faster than current antidotes,” Patterson said. “The antidote is also effective over a wider time window. Giving emergency responders more time is important because it’s not likely that someone will be exposed to cyanide near a paramedic.”

The antidote was tested on animals and has been exceptionally effective, Patterson said. Researchers hope to begin human clinical trials during the next three years.

The antidote is also unique because it can be taken orally (current antidotes must be given intravenously) and may be administered up to an hour prior to cyanide exposure.

Cyanide is a rapid acting toxin that inhibits cellular respiration – it prevents the body from using oxygen. This means it rapidly shuts down many of the fundamental biochemical processes the body needs to survive. Symptoms of acute cyanide poisoning include headache, vertigo, lack of motor coordination, weak pulse, abnormal heartbeat, vomiting, stupor, convulsions, coma, and even death.

When released in an enclosed area, cyanide can be particularly deadly and impact a victim very quickly. Survivors of cyanide poisoning are also at risk of short-term memory loss and development of a Parkinson's-like syndrome.

Because cyanide occurs naturally in pitted fruits, some grasses and other foods, and the body has mechanisms to detoxify small amounts in the diet. The new antidote takes advantage of this natural detoxification pathway by providing the substance the body naturally uses to convert cyanide to non-toxic thiocyanate.

Source: University of Minnesota

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