Mar 8, 2010
King Cobra venom has potential to delay dementia
Toxin found in venom can protect nerve cells from degeneration
By Judith Tan

THE bite of the King Cobra, which can bring down an elephant, has been found by Singapore scientists to yield a toxin that could delay the onset of dementia and possibly help against nicotine addiction.

The unique toxin was isolated from the more than 100 other toxins that make up the venom of the world's longest poisonous snake.

Named Haditoxin by researchers from the Department of Biological Sciences at the National University of Singapore (NUS), the chemical targets specific messages sent by the nerves to the brain.

It comes from a toxin family found in almost all venomous snakes around the world, and it blocks specific subtypes of neuroreceptors - the message-receiving chemicals in the brain - protecting nerve cells from degeneration, the main cause of Alzheimer's disease.

Snake toxin expert Manjunatha Kini said it is much like how botulinum toxin, popularly known as botox, acts to relax the contraction of muscles by blocking nerve impulses.

'This is where the similarity ends. While there is a need to get another jab of botox after six to eight months, our research has shown that the effects of Haditoxin are irreversible when it comes to binding to the nicotinic acetylcholine receptor (nAChR) in mammals,' he said.

This receptor is key in neuron communication.

So far, however, the effects of the drugs can be seen only in mice and rats.

Professor Kini hopes the protein can be used as long-term therapeutic treatment for dementia in humans.

The 10-member NUS team, led by Prof Kini, spent three years intensively researching the compound. They worked closely with counterparts from the School of Medical Science at the Griffith University in Australia, and the University of Geneva in Switzerland on the study.

The findings will be published in a peer journal, Journal of Biological Chemistry on Friday.

Research is still ongoing and it will be several years before an actual drug is developed for treatment and made available on the market.

King Cobras live mainly in the rain forests and plains of India, southern China, and South-east Asia. They can grow to more than 5m and when confronted, raise up to a third of their bodies straight off the ground and still move forward to attack.

Their venom is not the most potent, but the amount of neurotoxins they can deliver in a single bite is enough to kill an elephant or 20 people.

Haditoxin is the third new compound with therapeutic properties that the team has discovered from the venom of the King Cobra.

The other two are Ohanin that could help treat anxiety and ë½-Cardiotoxin for the treatment of hypertension (high blood pressure).

These two compounds are currently being studied to be developed into drugs to treat the two conditions.
Prof Kini said the nACh receptors also binds nicotine, making it addictive and the ability of Haditoxins to block these receptors could be an answer to treating the problem of smoking.

'But as the mechanism of action by the toxin is not yet clear, understanding these processes is interesting in terms of research as well as therapeutics,' he added.