Beyond Botox: Natural born killer or medical miracle?

March 15 2013

Botox is best known for its use in cosmetic procedures, but this potent neurotoxin could be transformed into an extraordinary drug to treat a raft of debilitating conditions, a leading scientist will tell an audience at the University of Lincoln.

Synthesised by clostridium botulinum, botox is the most deadly poison known to man, however, in tiny doses it is widely used as an effective anti-aging treatment. In injection form the toxin blocks the signals that tell muscles to contract, reducing the appearance of wrinkles.

Now scientists are working to expand the toxin's potential as a prodigious drug that could be used for the treatment of disorders such as cerebral palsy, Parkinson's and chronic migraine.

A scientist from the University of Lincoln (UK), who is working on refining the botox protein, will talk about its use in treating a broad range of neurological disorders in a free public lecture on 19th March, 2013.

Dr Enrico Ferrari, from the University's School of Life Sciences, will also reveal the future avenues for turning this natural born killer into a therapeutic drug.

He said: "Many painkillers relieve pain temporarily and have various side effects. The selling point of this molecule is that the pain relief could last up to seven months, in a similar way that Botox injections last for several months. Engineering this kind of toxin has many uses and would be a major improvement in the quality of life for those people who suffer from chronic pain."

Dr Ferrari joined the University in October 2012 after spending three years working with a group at the Medical Research Council's Laboratory of Molecular Biology in Cambridge.

Led by Professor Bazbek Davletov, the team developed a new way of joining and rebuilding elements of the clostridium botulinum neurotoxin in a way that eliminated the unwanted toxic effects. In its natural state 150 nanograms would be enough to kill a person.

Dr Ferrari said: "The re-engineered toxin has very similar characteristics so is still able to block neurotransmission release, but the paralytic effect is a lot less because we have discovered a way to impede the toxin from reaching the muscles."

The lecture entitled Beyond Botox: molecular engineering and the design of new therapeutics takes place at 6pm on Tuesday, 19th March at the University of Lincoln's EMMTEC auditorium. Registration starts at 5.30pm.

A review paper entitled 'Presynaptic neurotoxins: An expanding array of natural and modified molecules' by Bazbek Davletov, Enrico Ferrari and Yuri Ushkaryov was published in the September/October 2012 edition of *Cell Calcium*.

More information: Go to www.sciencedirect.com/science/ … ii/S0143416012000942 to view the full paper.

Provided by University of Lincoln