

Botulinum neurotoxin: Evolution from poison, to research tool - Onto medicinal therapeutic and future pharmaceutical panacea

Kostrzewa, Richard M.

Segura-Aguilar, Juan

Botulinum neurotoxin (BoNT), for more than a hundred years, has been a recognized poisonous principle in spoiled food. As its chemical structure became unraveled, and as more knowledge was gained over its mechanism of toxicity, it became clear that BoNT had the potential to act therapeutically as a targeted toxin that could inactivate specific nerve populations, and thus achieve a therapeutic goal. BoNT has evolved over the past 25 years into a viable therapeutic, now being a first line treatment for dystonia, overtly altering the course of progression of this disorder. BoNT is used for hyperhidrosis and gustatory sweating syndrome, alleviation of pain, as a treatment for overactive bladder, achalasia and anal fissure; and it has gained popularity as a cosmetic aid. Many other possible uses are being explored. The greatest potential for BoNT may lie in its being a molecular Trojan Horse - able to carry a specific enzyme or specific drug to the inside of a cancer or other type of cell w