Docking of Vesicles to Presynaptic Membrane
Prevented by Lyme Botulinum-Family of Toxins

Mechanism of Neurotransmitter Release

Only recently has the mechanism of neurotransmitter release been understood at the molecular level. The proteins responsible for this highly detailed process have been isolated and characterized. Some parts of the puzzle are not as yet completely understood, for example, the process of membrane fusion. A study of the release of neurotransmitters from nerve endings have also revealed the mechanism of “switching”, a process by which only one nerve among several in close proximity may be separately fired. This switching process is analogous to a similar process occurring in computers. Our brains work in a manner, in many ways, similar to that of computers. See Chart 2.

Three Stages in the Release of Neurotransmitter Acetylcholine from Vesicles

SNAP-25: Synaptosomal-Associated Membrane Protein, 25kDa
VAMP: Vesicle-Associated Membrane Protein
NSF: N-Ethylmaleimide-Sensitive Factor
SNARE: Soluble N-Ethylmaleimide-Sensitive Factor Activating Protein Receptor