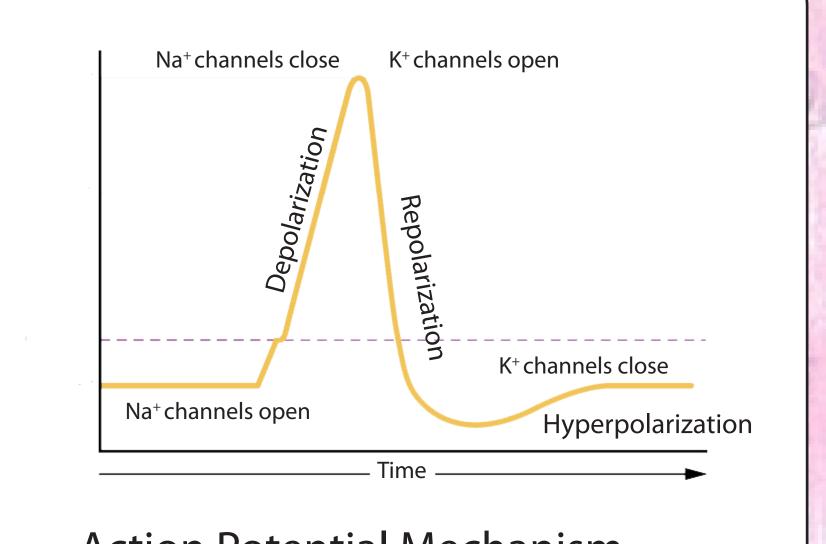


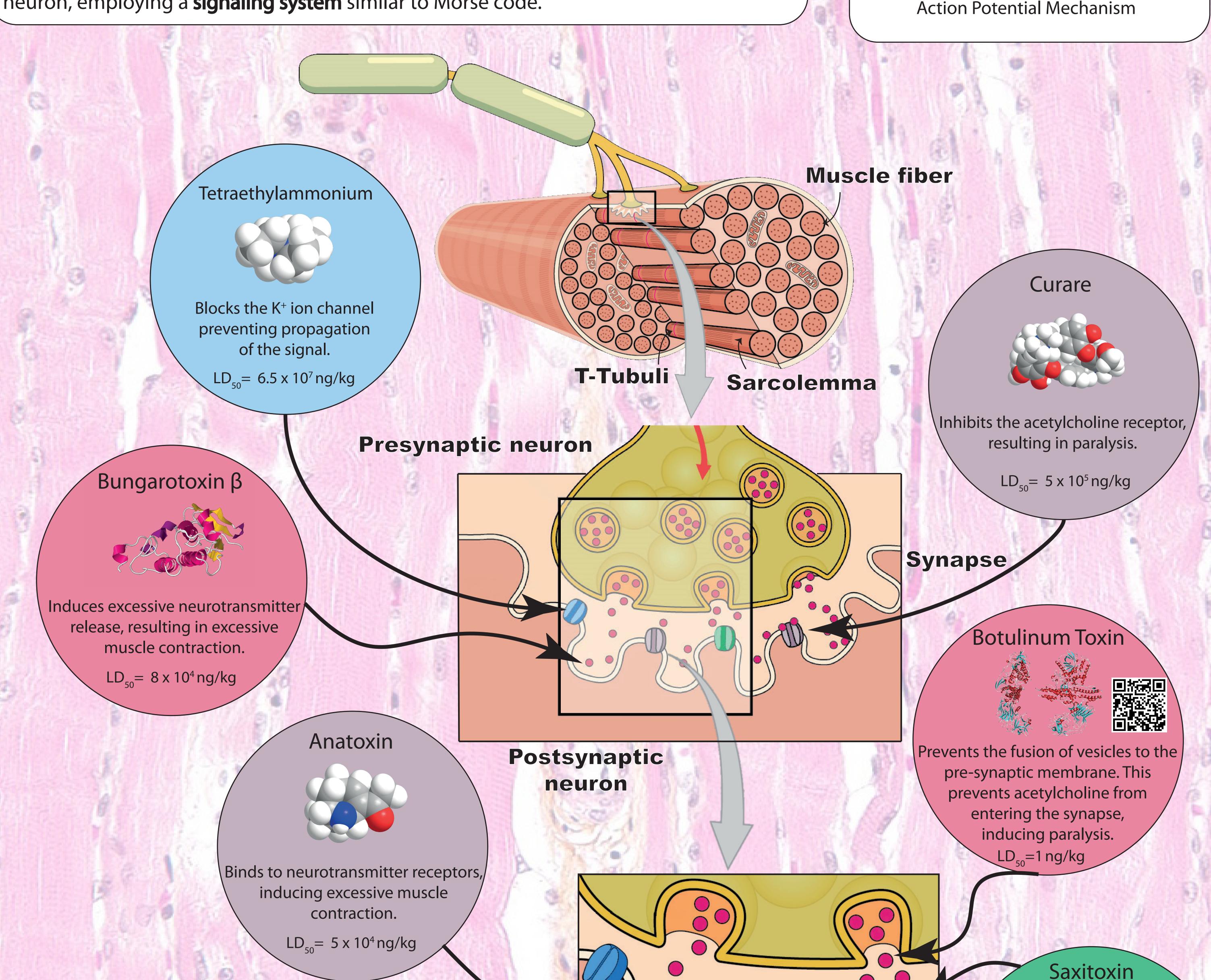
## ORGANISATION FOR THE PROHIBITION OF CHEMICAL WEAPONS Working Together for a World Free of Chemical Weapons

## Toxins and the Neuromuscular System

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A **synapse**, the gap between two nerve cells (neurons), allows chemical signals to be relayed from one neuron to another. The junction between a motor neuron and a muscle is referred to as a **neuromuscular** synapse. Neurons rely on the movement of ions (charged species especially K<sup>+</sup>, Ca<sup>2+</sup>, Cl<sup>-</sup>, Na<sup>+</sup>) inducing a current, the so-called **action potential** responsible for electrical signalling. Signals are initiated when a **neurotransmitter** chemical (acetylcholine) binds to a specific **receptor** (acetylcholine receptor), triggering the opening of an **ion channel**. Information is transmitted along the neuron, employing a **signaling system** similar to Morse code.







Vesicles

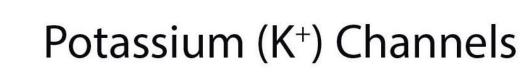
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Neurotransmitter Receptors



Acetylcholine (Neurotransmitter)





Sodium (Na<sup>+</sup>) Channels



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Point of initiation of toxin effect

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Once a signal is released into the sarcolemma (a sheath surrounding the muscle), an action potential travels down the T-Tubuli ( structure found between muscle fibers). This triggers a release of calcium ions into the sarcoplastic reticulum which results in muscle contraction. For more information, scan the QR code.



Blocks voltage-gated Na<sup>+</sup> channels,

preventing depolarization. This

results in paralysis.

 $LD_{50} = 1 \times 10^4 \text{ ng/kg}$