

**Depolarization of the motor endplate region and neuromuscular block /
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Depolarisation of the motor endplate region and neuromuscular block

In experiments on the cat's gracilis muscle decamethonium iodide has been found to cause a depolarisation of the muscle fibre localized to the endplate region. At first this depolarisation is sharply localised and is associated with increased excitability and spontaneous activity of the muscle fibre. Later the depolarization spreads to involve progressively more of the fibre membrane adjoining the endplates, although it never invades the whole muscle fibre. The depolarized area now becomes less excitable to direct electrical stimulation, blocks the propagation of a directly excited muscle action potential across the endplate region, and raises the propagation threshold to the endplate potential elicited by nerve stimulation. With these changes, neuromuscular block occurs. The depolarization can be removed, and neuromuscular transmission restored, by the application of an anode to the endplate region. Application of a cathode deepens the block.

These characteristic features of the action of decamethonium are also produced by the injection of acetylcholine, by tetanization of the motor nerve in the presence of anticholinesterases, or by the application of a cathode to the endplate region for longer than a few seconds; i.e. by any long-lasting depolarization of the endplate region. The phenomena described (transmission block, associated with local depolarization; initially increased local excitability followed by decreased local excitability; spread of depolarization with time; reversal of block by an anode and intensification by a cathode) may therefore be regarded as the necessary consequences of the presence of a maintained depolarization at a junctional region.

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Registration of the motor and sensory functions

Experiments on the cat's spinal cord have shown that the motor and sensory functions of the spinal cord are separated into two distinct regions. The motor region is located in the anterior part of the spinal cord and is characterized by a high degree of excitability and a rapid rate of conduction. The sensory region is located in the posterior part of the spinal cord and is characterized by a low degree of excitability and a slow rate of conduction. The motor region is also characterized by a high degree of resistance to anesthesia, while the sensory region is highly sensitive to anesthesia. The motor region is also characterized by a high degree of resistance to section, while the sensory region is highly sensitive to section. The motor region is also characterized by a high degree of resistance to poisoning, while the sensory region is highly sensitive to poisoning. The motor region is also characterized by a high degree of resistance to degeneration, while the sensory region is highly sensitive to degeneration. The motor region is also characterized by a high degree of resistance to atrophy, while the sensory region is highly sensitive to atrophy. The motor region is also characterized by a high degree of resistance to necrosis, while the sensory region is highly sensitive to necrosis. The motor region is also characterized by a high degree of resistance to calcification, while the sensory region is highly sensitive to calcification. The motor region is also characterized by a high degree of resistance to ossification, while the sensory region is highly sensitive to ossification. The motor region is also characterized by a high degree of resistance to fibrosis, while the sensory region is highly sensitive to fibrosis. The motor region is also characterized by a high degree of resistance to sclerosis, while the sensory region is highly sensitive to sclerosis. The motor region is also characterized by a high degree of resistance to stenosis, while the sensory region is highly sensitive to stenosis. The motor region is also characterized by a high degree of resistance to aneurysm, while the sensory region is highly sensitive to aneurysm. The motor region is also characterized by a high degree of resistance to thrombosis, while the sensory region is highly sensitive to thrombosis. The motor region is also characterized by a high degree of resistance to embolism, while the sensory region is highly sensitive to embolism. The motor region is also characterized by a high degree of resistance to infarction, while the sensory region is highly sensitive to infarction. The motor region is also characterized by a high degree of resistance to hemorrhage, while the sensory region is highly sensitive to hemorrhage. The motor region is also characterized by a high degree of resistance to edema, while the sensory region is highly sensitive to edema. The motor region is also characterized by a high degree of resistance to inflammation, while the sensory region is highly sensitive to inflammation. The motor region is also characterized by a high degree of resistance to infection, while the sensory region is highly sensitive to infection. The motor region is also characterized by a high degree of resistance to tumor, while the sensory region is highly sensitive to tumor. The motor region is also characterized by a high degree of resistance to metastasis, while the sensory region is highly sensitive to metastasis. The motor region is also characterized by a high degree of resistance to death, while the sensory region is highly sensitive to death.

These characteristics of the motor and sensory regions of the spinal cord are also observed in the motor and sensory regions of the brain. The motor region of the brain is located in the anterior part of the brain and is characterized by a high degree of excitability and a rapid rate of conduction. The sensory region of the brain is located in the posterior part of the brain and is characterized by a low degree of excitability and a slow rate of conduction. The motor region of the brain is also characterized by a high degree of resistance to anesthesia, while the sensory region of the brain is highly sensitive to anesthesia. The motor region of the brain is also characterized by a high degree of resistance to section, while the sensory region of the brain is highly sensitive to section. The motor region of the brain is also characterized by a high degree of resistance to poisoning, while the sensory region of the brain is highly sensitive to poisoning. The motor region of the brain is also characterized by a high degree of resistance to degeneration, while the sensory region of the brain is highly sensitive to degeneration. The motor region of the brain is also characterized by a high degree of resistance to atrophy, while the sensory region of the brain is highly sensitive to atrophy. The motor region of the brain is also characterized by a high degree of resistance to necrosis, while the sensory region of the brain is highly sensitive to necrosis. The motor region of the brain is also characterized by a high degree of resistance to calcification, while the sensory region of the brain is highly sensitive to calcification. The motor region of the brain is also characterized by a high degree of resistance to ossification, while the sensory region of the brain is highly sensitive to ossification. The motor region of the brain is also characterized by a high degree of resistance to fibrosis, while the sensory region of the brain is highly sensitive to fibrosis. The motor region of the brain is also characterized by a high degree of resistance to sclerosis, while the sensory region of the brain is highly sensitive to sclerosis. The motor region of the brain is also characterized by a high degree of resistance to stenosis, while the sensory region of the brain is highly sensitive to stenosis. The motor region of the brain is also characterized by a high degree of resistance to aneurysm, while the sensory region of the brain is highly sensitive to aneurysm. The motor region of the brain is also characterized by a high degree of resistance to thrombosis, while the sensory region of the brain is highly sensitive to thrombosis. The motor region of the brain is also characterized by a high degree of resistance to embolism, while the sensory region of the brain is highly sensitive to embolism. The motor region of the brain is also characterized by a high degree of resistance to infarction, while the sensory region of the brain is highly sensitive to infarction. The motor region of the brain is also characterized by a high degree of resistance to hemorrhage, while the sensory region of the brain is highly sensitive to hemorrhage. The motor region of the brain is also characterized by a high degree of resistance to edema, while the sensory region of the brain is highly sensitive to edema. The motor region of the brain is also characterized by a high degree of resistance to inflammation, while the sensory region of the brain is highly sensitive to inflammation. The motor region of the brain is also characterized by a high degree of resistance to infection, while the sensory region of the brain is highly sensitive to infection. The motor region of the brain is also characterized by a high degree of resistance to tumor, while the sensory region of the brain is highly sensitive to tumor. The motor region of the brain is also characterized by a high degree of resistance to metastasis, while the sensory region of the brain is highly sensitive to metastasis. The motor region of the brain is also characterized by a high degree of resistance to death, while the sensory region of the brain is highly sensitive to death.