

Protein from tick saliva studied for potential myasthenia gravis treatment

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Looking for a better treatment for the autoimmune disease myasthenia gravis, researchers have found that a protein in tick saliva shows promise in limiting the severity of the disease in an animal model in a study published in the *Annals of Neurology*.

"This disease can leave patients weak and on breathing machines, and conventional treatments can be toxic," said Henry Kaminski, M.D., chair of the department of neurology and psychiatry at Saint Louis University and one of the nation's leading experts on myasthenia gravis. "There is a real need for better treatments. This study is a step in that direction."

Myasthenia gravis is a highly debilitating, chronic [neuromuscular disorder](#) that affects about 400 to 600 per 1 million people, and roughly 1,100 to 1,700 people in the St. Louis area. Symptoms include weakness in the arms and legs, [chronic muscle fatigue](#), difficulty breathing, difficulty chewing and swallowing, slurred speech, droopy eyelids and blurred or double vision.

While drugs like prednisone, a corticosteroid, can be effective in treating the disorder, they also can carry a host of severe side effects, including pronounced weight gain, osteoporosis, glaucoma and diabetes.

Other treatments, [intravenous immunoglobulin](#) and plasmapheresis, which involve blood plasma, are expensive and can have rare but serious side-effects such as infections, heart attacks and stroke.

Doctors believe that myasthenia gravis is caused by an overreaction of the complement system, a component of the immune system that specifically defends against parasites, bacteria and other pathogens. Antibodies block [nerve receptors](#) at the neuromuscular junction, the place where nerves connect with muscles, and then activate complement which prevents muscle contraction from occurring, causing weakness.

To impede the complement system's misplaced response, researchers hope a new class of drugs, called complement inhibitors, may stop the body's defense system from attacking itself.

Other researchers discovered that rEV576, a protein found in [tick saliva](#), works as a complement inhibitor, allowing ticks to avoid setting off an immune response in their human host.

SLU researchers in collaboration with Varleigh Limited tested the protein on two groups of rats with mild and severe models of myasthenia gravis. The health of rats that were given the complement inhibitor rEV576 improved, with reduced weakness and weight loss.

Researchers hope rEV576 could have therapeutic value in human myasthenia gravis. And, because ticks apply themselves to people without causing a reaction, researchers are optimistic that rEV576 will not cause allergic reactions or other negative side effects.

"Complement inhibitors are a completely new class of drugs," said Kaminski. "This one will probably prove to be superior to what we've seen. Since complement is activated in many diseases such as Alzheimer's, stroke and rheumatoid arthritis, our studies may be important for other diseases."

Source: Saint Louis University

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