WISBUSINESS.COM
Wisconsin's Business News Source

April 10th, 2007

Venomous jellyfish to the rescue

MADISON -- In collaboration with a UW-Milwaukee lab, a Wisconsin biotech company is developing a compound from a protein found in jellyfish to act as a neuro-protective agent which may be effective in treating neurodegenerative diseases.

The neuro-protectant called aequorin could fight a whole series of degenerative diseases such as Alzheimer's, Parkinson's, Huntington's, Amyotrophic Lateral Sclerosis (ALS), Multiple Sclerosis (MS) and other rare neuro-degenerative diseases. "Testing of aequorin has yielded some very promising results," said Mark Underwood, president of Quincy Bioscience.

Assistant professor and collaborator James Moyer of UW-Milwaukee showed that when he subjected rat brain cells to "stroke conditions" in the lab, up to 28 to 45 percent of the cells treated with aequorin survived without any residual toxic side effects. Moyer's team is now testing the protein in healthy young animals to assess whether it helps them learn and retain their memory as they age.

Underwood became interested in aequorin during his undergraduate years majoring in psychology at UW-Milwaukee after reading an article that linked the stings of jellyfish with the symptoms of multiple sclerosis, a disease that affected his mother.

What does a protein from a venomous jellyfish have to do with neuro-degenerative diseases? The answer has to do with calcium and calcium imbalance in the body. Calcium is required not only for bone growth but also for communication of neurons in the brain; learning and memory are not possible without it. But during aging and in neuro-degenerative diseases excessive inter-cellular calcium builds up and excites brain cells causing them to short circuit and eventually die. Cells normally control calcium influx via calcium-binding proteins that selectively bind to it preventing the calcium imbalance. Loss of these proteins is the common denominator between aging and the neurodegenerative disease process.

Aequorin is a calcium-binding protein that is similar in structure to its corresponding human protein and by selectively binding calcium, it acts as a "surge protector" preventing excess calcium buildup. While jellyfish inject their prey with calcium and kill them via calcium mediated cell death, they use high quantities of aequorin to protect themselves from circulating high calcium levels in their bodies.

In 2004, Underwood turned his idea of using aequorin as a neuroprotectant into a business plan. Quincy Bioscience was founded in concert with Mike Beaman, owner of the Quincy Resource Group, after recombinant techniques to make proteins in huge quantities were born. Underwood declined to discuss the amount and source of equity financing received by the company, but said it is privately funded.

Aequorin has been used as a toxicity indicator in scientific research for 40 years, but until now it has never been investigated for its therapeutic qualities. That is why Underwood's idea qualified for patent protection. But properties about its toxicity, availability, manufacture, and its selective calcium binding property were already known when the business started.

Because the basic properties of the protein were well known before the company was started, Quincy Bioscience at three years old is at the eight-year mark in the typical 15-year cycle for new drug development. The company expects to launch Prevagen (the aequorin dietary supplement that keeps 55 percent of the cells treated with it alive, compared to a placebo) in the market as early as September this year. The pharmaceutical aequorin product is in the pipeline, but about seven years away from the market, Underwood estimated.

Quincy business cards and the company website both read: "It can be done." That's in solidarity with President Ronald Reagan, who died the same day the company was founded – June 7, 2004. With the kind of data that experiments are showing so far, that motto may very well come true.

Jyotika is a student in the UW-Madison Department of Life Sciences Communication.

By Jigyasa Jyotika
WisBusiness.com