New drugs using the body's endocannabinoids to treat pain, cancer

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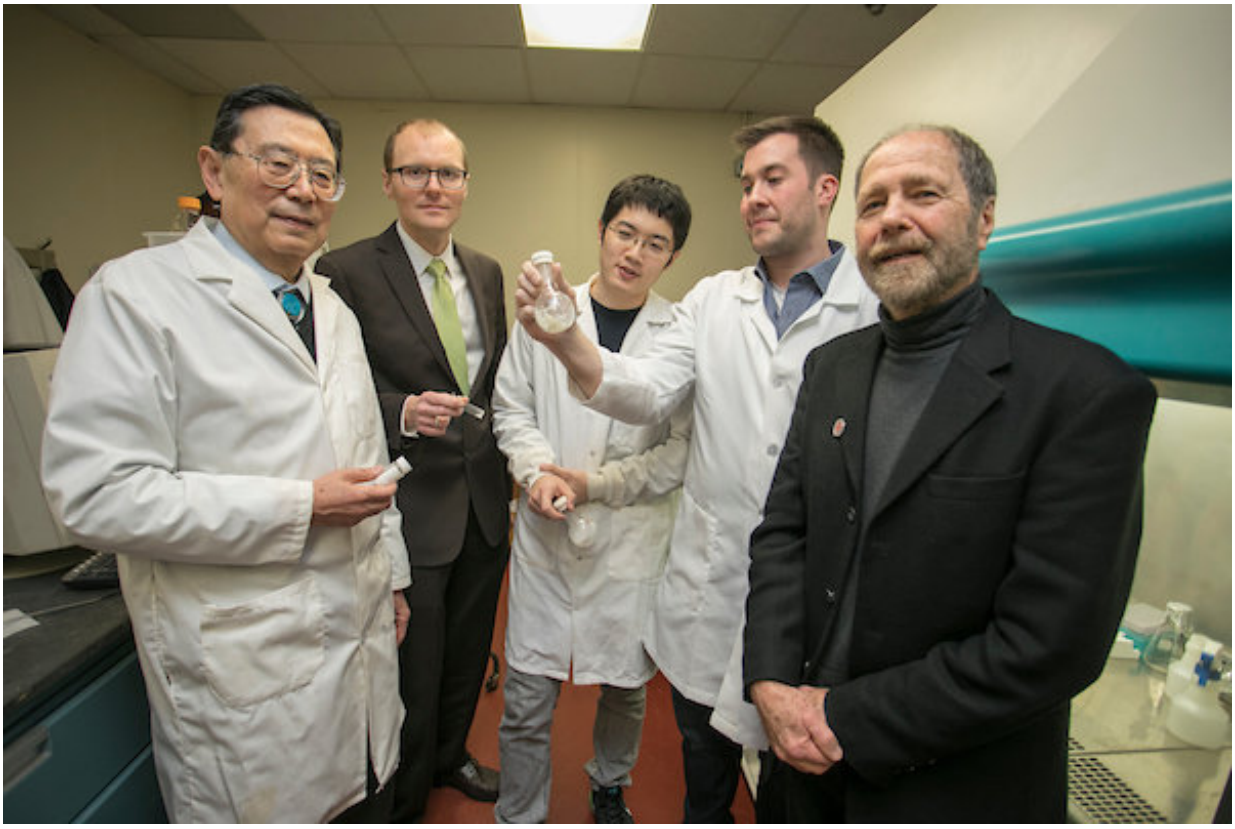

Stony Brook researchers have developed new chemical compounds that are licensed to Artelo Biosciences as potential drugs to treat pain, inflammation and cancer. Assembled with some of the compounds are, from left: Iwao Ojima, Martin Kazocha, graduate students Su Yan and Matthew Elmes, and Dale Deutsch

A new technology developed by Stony Brook University researchers affiliated with the Institute of Chemical Biology and Drug Discovery (ICB & DD) that has identified Fatty Acid Binding Proteins (FABPs) as drug targets of the body's endocannabinoid system is licensed to Artelo Biosciences, Inc. Endocannabinoids are natural marijuana-like substances in the body and have potential as the basis for new medicines. Artelo has an exclusive license with the Research Foundation for the State University of New York to the intellectual property portfolio of FABP inhibitors for the modulation of the endocannabinoid system for the treatment of pain, inflammation and cancer.

Fatty acid binding proteins have been identified as intracellular transporters for the endocannabinoid anadamide (AEA), a neurotransmitter produced in the brain that binds to THC receptors. Animal studies have demonstrated that elevated levels of endocannabinoids can result in beneficial pharmacological effects on stress, pain and inflammation and also ameliorate the effects of drug withdrawal. By inhibiting FABP transporters, the level of AEA is raised. Potential drugs acting in this manner would create elevated levels of AEA. The mechanism of action of such drugs would be similar to that of current antidepressants, which inhibit the transport of serotonin.

During the first year of the agreement, Artelo will collaborate with the Stony Brook research team to identify a lead FABP compound for drug development and formulation. The company will then conduct drug efficacy tests in nonclinical animal models of the compound.

The multidisciplinary research team is led by Dale Deutsch, PhD, Professor in the Department of Biochemistry and Cell Biology, and a member of the ICB & DD. The research has been supported by a $3.8 million grant from the National Institute on Drug Abuse, an arm of the National Institutes of Health.

"The unique aspect of this research is that our focus is to investigate ways to active natural 'marijuana' in our bodies, the endocannabinoids," said Deutsch. "This system has advantages over the properties of actual marijuana since endocannabinoids are not connected with dependence, potentially leading to addiction, but does act effectively against pain."

Their research startedin 2009 with the identification of the FABPs as the transporters of the endocannabinoids. When these compounds bind to the FABP they resulted in higher levels of AEA specifically. By using computational biology for virtual screening and actual assays, the researchers discovered lead compounds that bind to the FABPs and were analgesics for various types of pain.

The AEA research led to three Stony Brook University patent-covering new chemical compounds (called Stony Brook FABP Inhibitors or SB-FIs), which Artelo will investigate during its drug development plan.

"This licensing agreement gives us access to a promising intellectual property portfolio that is squarely aligned with our strategic direction as a scientific team with a proven track record of success," said Gregory Gorgas, Chief Executive Officer of Artelo. "Working together to evaluate and identify novel FABP inhibitors based upon existing scientific data for clinical development will be complimentary to our drug pipeline and create a new opportunity for Artelo."

In order to design the novel FABP inhibitors, members of the FABP Stony Brook research group required expertise in many disciplines, such as biochemistry, chemistry, computational biology, computer science, X-ray crystallography and medicine.

Provided by Stony Brook University