Researchers Shed Light on Muscle Growth Regulator

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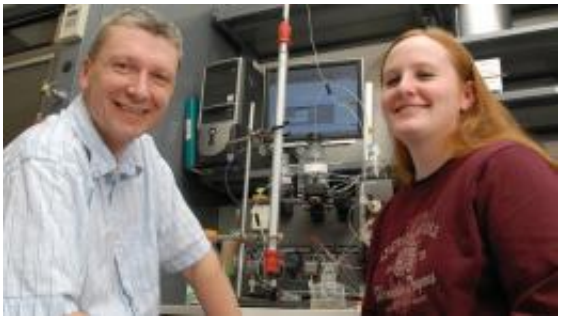

Tom Thompson, PhD, and Jennifer Cash

(PhysOrg.com) -- Research at the University of Cincinnati has led to the first published structure of myostatin, a protein that regulates muscle growth in animals, offering hope for major advances in the fight against muscle-wasting diseases.

Corresponding author Tom Thompson, PhD, an assistant professor and structural biologist in the molecular genetics, biochemistry and microbiology department, detailed his research team's findings, headed by first author and graduate student Jennifer Cash, in a peer-reviewed article for the EMBO Journal, a publication of the European Molecular Biology Organization.

The article presents the atomic crystal structure of myostatin in complex with the natural inhibitor follistatin and uncovers important features of

myostatin that pertain to how it signals and is degraded, or neutralized.

Neutralization of an animal's naturally occurring myostatin results in a marked increase in muscle mass. Therefore, therapeutics that target myostatin and stop it from working would stimulate muscle growth, offering a benefit to patients with muscle-wasting diseases such as muscular dystrophy, cancer and sarcopenia, the age-related loss of muscle mass, strength and function.

"Understanding the features that are unique to myostatin is important to discovering how to inhibit myostatin without unwanted side effects," says Thompson. "The structure will allow us to manipulate protein inhibitors such as follistatin and help in the identification of small molecules that specifically disrupt myostatin activity."

Armed with new insights into myostatin's structure, Thompson will work with the Drug Discovery Center at UC's Genome Research Institute to identify drug-like inhibitors to myostatin.

Thompson has been working with the aid of more than $1.5 million in grants, including a $1.15 million National Institutes of Health (NIH) R01 grant and a $300,000 Muscular Dystrophy Association grant, both awarded in 2008. He previously was awarded a four-year, $260,000 grant from the American Heart Association (AHA).

In addition, Cash was awarded a two-year AHA fellowship to support her work on the project.

Provided by University of Cincinnati (news : web)