

# Scientists find potential protein biomarkers for growth hormone

June 17 2008

---

Ohio University scientists have identified several proteins in mice that might act as biomarkers for growth hormone. The research could be the first step to finding a more reliable way to detect recombinant human growth hormone (rhGH), which some athletes and teenagers use illegally to boost muscle and reduce fat.

At the Endocrine Society annual meeting in San Francisco today, scientists John Kopchick and Juan Ding presented a new study that pinpointed four proteins that significantly decreased or increased in the blood after exposure to bovine growth hormone, which is similar to human growth hormone.

The researchers injected six 6-month-old male mice with growth hormone for seven days. They studied blood samples from the mice and compared the results to six control animals. Kopchick and Ding scanned hundreds of plasma proteins and found four – apoA1, transthyretin, clusterin and albumin – that showed a strong reaction to growth hormone.

"They're in the blood, but we don't know if they're coming from liver, fat, muscle or the kidneys," said Kopchick, Goll-Ohio Professor of Molecular Biology with Ohio University's Edison Biotechnology Institute and College of Osteopathic Medicine.

Kopchick and Ding, a graduate student in biological sciences, are hopeful that the proteins could be viable biomarkers for growth hormone

activity in humans as well.

"In mice we can control the variables and the environment, but humans are genetically diverse and have different lifestyles that impact growth hormone. So the results may point to future study in humans, but may not necessarily apply to humans yet," said Ding, who also is studying how to identify protein biomarkers for human aging.

Growth hormone is hard to detect because it has a serum half life of only 15 minutes. RhGH, an approved drug for individuals with growth hormone deficiency, also is identical to human growth hormone. The current method of detecting growth hormone, analyzing levels of insulin-like growth factor (IGF-1), isn't always accurate, the researchers said, as it is age and gender sensitive.

"If you have an 18-year-old Olympic athlete and a 38-year-old athlete, the IGF-1 values may look very different," said Kopchick, whose research is funded by the Ohio Eminent Scholars program and Ohio University's Edison Biotechnology Institute.

Because identification of rhGH misuse or abuse has high stakes – it can make or break an athletic career – the current method has too many variables to depend on, he said.

It's still early to tell whether these protein markers have the same age limitations, as the mice in the study live to only 2 years. But the markers may have longer half lives of several days, which would offer a wider testing window, he said.

Kopchick already is exploring how to detect rhGH in human blood and tissues through a project with Danish scientist J.O. Jorgensen. The team received a three-year grant from the World Anti-Doping Agency to look for protein markers in blood and tissues of human subjects exposed to

rhGH or exercise, as well as patients with growth hormone disorders.

Source: Ohio University

Citation: Scientists find potential protein biomarkers for growth hormone (2008, June 17)  
retrieved 25 April 2024 from

<https://phys.org/news/2008-06-scientists-potential-protein-biomarkers-growth.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.