Researchers develop new advanced method for measuring protein synthesis

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In a major breakthrough for future research and drug development, a team of Los Angeles Biomedical Research Institute (LA BioMed) investigators developed a new, more reliable method for measuring protein synthesis and turnover, processes that are critical to understanding cellular functions.

Their findings were reported in the online edition of the *Journal of Applied Physiology*, a peer-reviewed journal. The researchers used deuterated or "heavy" water -- water to which the normal hydrogen is partly replaced by added deuterium – and mass spectrometry to determine specific protein synthesis. Previous methods for measuring protein synthesis required purification of proteins and weren't as accurate or reliable.

This new method makes it possible for scientists to study the dynamics of every protein in the human body.

"This is really the definitive method for measuring protein synthesis because it enables scientists to measure this critical process accurately for the first time," said Wai-Nang Paul Lee, M.D. and a LA BioMed investigator. "The proteins are the structure, the skeleton and the enzymes that allow the cell to function. Protein synthesis is a very sensitive indicator of the integrity of the cell and the function it performs."

Dr. Lee was the leader of a team of LA BioMed researchers that

included Drs. Gary Guishan Xiao, Meena Garg, Shu Lim and Derek Wong. Dr. Vay Liant Go, Department of Medicine, Division of Gastroenterology, David Geffen School of Medicine, Los Angeles, California, also participated in the research.

In the past, scientists used labeled amino acids to help determine protein synthesis. But this process had the potential of introducing errors and required protein purification. The use of deuterated water eliminated these errors and made the proteins easier to measure. The scientists determined this method would be especially useful in studies of protein turnover and protein expression in proteomics to address important clinical questions such as the age and dynamics of amyloid plaques in Alzheimers disease.

Source: Los Angeles Biomedical Research Institute at Harbor-UCLA Medical Center