

# International Summit on Current Trends in Mass Spectrometry

## July 13-15, 2015 New Orleans, USA

### The effects of dietary unsaturated fatty acids on prostate cancer – A proteomic approach

Mu Wang

Indiana University, USA

Prostate cancer (PCa) is one of the most common cancers in men. In most PCa cases, tumors progress very slowly but in a small portion of patients, PCa develops into aggressive stages and becomes lethal. A line of evidence has suggested that early inference and dietary prevention are beneficial in PCa patient care. Fish oil (FO), which contains mostly omega-3 fatty acid (n-3 FA), is one of the most widely studied candidate supplements for PCa prevention; however, the molecular mechanism of its function remains elusive. The aim of this study was to identify and characterize factors and pathways involved in fatty acid metabolism in prostate cancer cells through proteomic and phosphoproteomic analyses. Our data suggest that the effects of fatty acids on prostate cancer may be a multi-stage event and autophagy, a double-edged sword, may play a critical role. Global discovery also found other proteins such as non-specific lipid-transfer protein (SCP2), fascin, integrin beta-1, calnexin, and prostate-associated microseminoprotein (MSMP) being altered in fatty acid treated cells. Cell signal pathway analysis reveals that FO modulates some pathways associated with cell cycle and glycolysis. Additionally, the global phosphoproteome study showed different phosphorylation patterns under different FA treatments. Overall, this study shows that fatty acids suppress fatty acid synthase (FASN) activity but only omega-3 fatty acid induces cell death. More functional validation studies are in progress.

#### Biography

Mu Wang is the Director of Proteomics and Associate Professor of Biochemistry and Molecular Biology at Indiana University School of Medicine. He received his PhD in Bio-organic Chemistry from Washington University in St. Louis, Missouri, USA and was an NIH NRSA Postdoctoral fellow studying mechanism of DNA repair in mammalian system. He has published more than 80 peer-reviewed articles in biochemistry and proteomics related journals. His own research involves studies of cancer drug resistance mechanism and metabolism of omega-3 fatty acid in prostate cancer. He was a recipient of the HUPO (Human Proteome Organization) 2004 Young Investigator Award.

[muwang@iupui.edu](mailto:muwang@iupui.edu)

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