The new age of genetics: New approaches for the study of obesity and related

Over the past two decades, genetic studies in humans and model organisms have helped identify a large number of novel genes contributing to obesity and obesity-related health complications. The work in our lab has focused primarily on the lipid abnormalities often associated with obesity that are primarily responsible for the increased cardiovascular disease risk in affected individuals. These include elevated plasma triglyceride and cholesterol levels, the development of an atherogenic lipoprotein profile, and liver abnormalities, such as steatosis and non-alcoholic steatohepatitis.

Despite the results from genetic analyses, predominantly Genome-wide Association Studies (GWAS), it has been challenging to elucidate the underlying physiological mechanisms by which genetic sequence variants affect normal cell and organ function, and lead to obesity and other metabolic diseases. We will present novel approaches integrating genomics, proteomics, and metabolomics, and demonstrate how these integrated omics efforts can help advance the interpretation of disease-associated molecular and genetic mechanisms.