

## PROTEO-METABOLOMICS STUDIES FOR AUTOIMMUNE DISORDER AND BIOLOGICAL FUNCTIONS

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Proteo-metabolomics technologies are not so well used in autoimmune disorder studies. Global pharmaceutical companies are recognized already its importance and have been used for several years in drug development. This technology beginning its application in all over the biological research fields, and barrier between leading and developing countries is not so big.

We have been used proteo-metabolomics techniques in autoimmune disorder for the unraveling its mysterious mechanisms and seeking medical bio-markers. Rheumatoid arthritis is fatal and painful but hardly curing disease. We studied and revealing its progress mechanism and useful markers by comparing with osteoarthritis.

And also we used same technologies in cancer metastasis study and signaling cascades in biological functions with several diseases. I'll show you several findings after these studies.

## CHANGE OF HIGH-DENSITY LIPOPROTEIN (HDL) IN AGING-RELATED DISEASE AS RELIABLE BIOMARKER

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### **Abstract**

It has been reported that the glycation could also occurred in high-density lipoproteins (HDL) in blood. High-density lipoprotein-cholesterol (HDL-C) is inversely associated with incidence of cardiovascular disease and is directly related to longevity. In type 2 diabetes patients, blood infusion of rHDL caused reduction of plasma glucose levels by increasing plasma insulin in pancreatic beta cells, which raised the feasibility of a wider clinical application of rHDL from cardiovascular disease to diabetes. The glycation resulted in severe loss of beneficial functions of HDL regarding anti-senescence and anti-diabetic, and anti-atherosclerosis activity due to functional and structural modification with increased protein degradation.

To compare the change in lipoprotein metabolism with aging, we analyzed the lipid and protein compositions of individual lipoprotein fractions. Healthy and non-obese elderly subjects (elderly group, n=26) had a serum lipid profile within the normal range, although slightly higher than in young subjects (control group, n=18). However, the elderly group had a 2-fold higher serum uric acid level and triglyceride (TG)/high-density lipoprotein (HDL)-cholesterol ratio. The elderly group had less antioxidant ability and elevated TG content in HDL with enhanced cholesteryl ester transfer activity. An elevated level of advanced glycated end products in lipoproteins and fragmentation of apoA-I were present in the elderly group, with detected lower apoA-I level and more multimerized apoA-I in HDL. The protein levels of apoA-I, apoC-III, and serum amyloid A in lipoprotein-deficient serum were increased in the elderly group.

Keywords: aging, apolipoprotein, lipoprotein, cholesteryl ester transfer protein, advanced glycated end products, apoA-I.