

Proteomic analysis of human serum by two-dimensional gel electrophoresis for the discovery of biomarkers for type 2 diabetic nephropathy

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Diabetic nephropathy (DN) is the leading cause of end-stage renal disease worldwide and is associated with increased cardiovascular risk. The earliest clinical evidence of DN is microalbuminuria. In type-2 diabetes, a great proportion of patients show symptoms of microalbuminuria and overt nephropathy at or shortly after diagnosis of diabetes. Once microalbuminuria is detected, it indicates that anti-angiotensin II therapy should be initiated with the purpose to prevent or to delay the progress of DN. However, microalbuminuria cannot be an independent indicator of type 2 DN so that other screening methods such as biomarker assays are necessary to diagnose it more correctly. In the present study, to identify the biomarkers for initial diagnosis of type 2 DN, we compared protein profiles of human sera of 30 microalbuminuric type 2 diabetic patients with those of 30 normoalbuminuric type 2 diabetic patients by using the two-dimensional gel electrophoresis technique. As the results, in microalbuminuric patients, total sixteen proteins were shown to be differentially expressed. Thirteen proteins were down-regulated about 50% and the other three were up-regulated about 300% compared to those of normoalbuminuric patients. These differentially expressed spots in microalbuminuric patients were identified with ESI-Q-TOF (electrospray ionization quadrupole time-of-flight) mass spectrometry and confirmed by western blotting. These results suggest that these proteins can be used as diagnostic and monitoring biomarkers of type 2 DN if further studies are done.

References

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