

Testing Serum Proteome between Elite Sprinters and Long-Distance Runners

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Abstract : Proteomics represent the performance of genomic complement proteins and the protein level on functional genomics. This study adopted proteomic strategies for comparing serum proteins among three groups: elite sprinter (sprint runner group, SR), long-distance runners (long-distance runner group, LDR), and the untrained control group (control group, CON). Purposes: This study aims to identify elite sprinters and long-distance runners' serum protein and to provide a comparison of their serum proteome' composition. Methods: Serum protein fractionations that separated by sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) and analyzed by a quantitative nano-LC-MS/MS-based proteomic profiling. The one-way analysis of variance (ANOVA) and Scheffe post hoc comparison ($\alpha= 0.05$) was used to determine whether there is any significant difference in each protein level among the three groups. Results: (1) After analyzing the 307 identified proteins, there were 26 unique proteins in the SR group, and 18 unique proteins in the LDR group. (2) For the LDR group, 7 coagulation function-associated proteins' expression levels were investigated: vitronectin, serum paraoxonase/arylesterase 1, fibulin-1, complement C3, vitamin K-dependent protein, inter-alpha-trypsin inhibitor heavy chain H3 and von Willebrand factor, and the findings show the seven coagulation function-associated proteins were significantly lower than the group of SR. (3) Comparing to the group of SR, this study found that the LDR group's expression levels of the 2 antioxidant proteins (afamin and glutathione peroxidase 3) were also significantly lower. (4) The LDR group's expression levels of seven immune function-related proteins (Ig gamma-3 chain C region, Ig lambda-like polypeptide 5, clusterin, complement C1s subcomponent, complement factor B, complement C4-A, complement C1q subcomponent subunit A) were also significantly lower than the group of SR. Conclusion: This study identified the potential serum protein markers for elite sprinters and long-distance runners. The changes in the regulation of coagulation, antioxidant, or immune function-specific proteins may also provide further clinical applications for these two different track athletes.

Keywords : biomarkers, coagulation, immune response, oxidative stress

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