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Metabolomics profiling distinguishes elite power and endurance athletes

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Background & Aim: The elite performance of professional athletes is associated with alterations in their systemic metabolic profiling. The objectives of this study were to compare the metabolic profiling between low and high power and endurance elite athletes and to highlight the underlying metabolic pathways.

Methods: Sera from one 191 elite athletes who passed anti-doping laboratories' tests were profiled using non-targeted metabolomics-based mass spectroscopy combined with ultrahigh-performance liquid and gas. Differences in metabolic signatures were compared between low and high power and endurance groups by OPLS-DA and regression models.

Results & Conclusions: Data reveal that high performance athletes show a distinct metabolic profile that reflects steroid biosynthesis, fatty acid metabolism, oxidative stress and energy-related metabolites. Differences in performance-related metabolic profiles could shed light on the biochemical processes associated with their elite performance and potentially be utilized as biomarkers for endurance or power trainability in athletic candidates.

Biography

Mohamed A Elrayess has completed his PhD at University College London (UCL) in Cardiovascular Genetics in 2002. He has then studied the therapeutic utilization of hematopoietic stem cells in cardiovascular disease at the Department of Medicine in UCL. He has spent over 7 years working as a Stem Cell Scientist in Eisai Ltd, a major international pharmaceutical company, leading projects focusing on stem cell therapy in various neurodegenerative diseases. He currently occupies a Senior Scientist position at Anti-Doping Lab Qatar, where he leads projects focusing on the role of stem cells in diabetes and genetics and metabolomics of elite athletes.

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