

large, helps to make results achievable and reproducible. In details, during a game of 90 minutes, medium-high level players run for about 8-10 km at an intensity close to the anaerobic threshold (80-90% of maximum heart rate). However, within this endurance context are required numerous flashes of explosive strength, as kicks, jumps, sprints, changes of speed and direction and tackle, in addition to maintaining balance under defensive pressure to control the ball. Since the main component is, however, resistance, this could explain a genotypic profile typical of endurance athletes associated with football players. On the other hand, it should be stressed that athletic performances are multifactorial events: factors such as environment, gene-gene and gene-environment interactions play valuable roles in the complex traits of champions, that can not be reduced to a set of genetic polymorphisms.²⁸ This innovative method begins to be used in many other fields, such as the prevention of injuries and the investigation of muscular morphological changes, such as atrophy or myasthenic syndrome.^{29,30,31}

List of acronyms

ACE - angiotensin converting enzyme
ACTN3 - actin-binding protein alpha-actinin-3
CK-MM - Creatine kinase-MM
NRF - Nuclear Respiratory Factor
PCR-RFLP - Polymerase chain reaction-restriction fragment length polymorphism
PEPs - performance-enhancing polymorphisms
PPAR - peroxisome proliferator-activated receptor
TFAM - Mitochondrial Transcription Factor A
VO₂ - oxygen uptake

Author's contributions

Each author contributed in equal part to the manuscript.

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Conflict of Interest

The authors declare no conflicts of interests derived from the outcomes of this study.

Ethical Publication Statement

Institutional Review Board that approved the protocol for the study: Sport and Exercise Sciences Research Unit, University of Palermo, Italy.

We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

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