Malcolm Collins: Medicine and Sports Science, Vol. 54: Genetics and Sports

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The field of sports genetics has demonstrated a rapid expansion in recent years, propagated by the sequencing of the human genome. As an entity in its own right, sports genetics has been providing a growing body of literature concerning physical performance, injury, gene environment interactions and cross-correlation with various disease models. As such research in this field is relevant to a wide spectrum of individuals including clinicians, geneticists, trainers and the broader scientific community, it is to these groups, with their variable knowledge of the field, that this book is targeted.

The book succeeds in covering a broad scope effectively and comprehensively. The initial chapters discuss key concepts in human genetics, at an introductory level, as well as debates in the genetics of sport performance. In so doing, the book builds knowledge from chapter to chapter. Different experimental designs with their various shortcomings are also described in their historical context building from heritability studies, candidate gene association studies, genome wide association and also copy number repeats and the potential for their future relevance.

The interaction of gene and environment is addressed concerning sporting performance or, simply put, nature versus nurture. This is debated aptly and in an articulate manner providing stress on the importance of nutrition and foetal programming affecting the adult phenotype. In this regard, reference is made to common diseases for which there is a well-established body of research, particularly cardiovascular disease and diabetes mellitus.

In its chapters, the book comprehensively discusses the multiple phenotypes and genotypes that are associated with different aspects of sports performance, from balance and coordination, endurance and strength. Of relevance to the sports clinician is the chapter regarding the genetics of sports injuries. Genetic associations with collagen types, chromosome 9 and ABO blood groups and more recent research concerning Tenascin C are discussed in detail. Importantly, Matrix Metalloproteinases and ADAMTS are also included. Given their role in altering tendon homeostasis, mention in this book brings to the wider scientific community their relevance in tendon injury, pointing the direction of future therapy and genetic research in this area.

Several chapters concern themselves with future therapeutic strategies in sports medicine involving viral gene therapies—either in vivo or ex vivo applications—and their advantages and shortcomings. Similarly, gene doping and the ethics of gene therapy are discussed in various chapters.

This book is well structured with accessible indices and useful chapter headings. Common debates, issues and key genes of importance in the field (ACE and actinin-3) are presented appropriately and reasonably and taken from up to date sources. Tables are informative and succinct. There is some overlap of content between chapters, possibly because of the different author contributions. However, this does not detract from the book as a whole.

Despite only being ~200 pages in length, the breadth of the material covered is extensive and this is achieved succinctly. Again, this is in part due to the different specialities of the contributing authors.

This volume achieves its goal of being the genetics book on sport for a mixed disciplinary reader and thus is a worthwhile addition for those interested in the evolving field of genetics in sport and its future direction.

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