

# Need for sports genetics

**Abbreviations:** HGP, human genome project; SNPs, single nucleotide polymorphisms; GWAS, genome wide association studies; ACE, angiotensin-i converting enzyme; ACTN3, alpha- actinin-3

## Editorial

Human Genome Project (HGP) had a great impact on molecular life, not only in clinical era, but also in different physiologic conditions. Sports genetics is a new branch of molecular science which deals with predisposition to exercise, injuries, stress and nutrition in sports. It depends on the single nucleotide polymorphisms (SNPs) which effects gene regulation and effects athletic performance. Genetic and epigenetic environmental factors such as nutrition play crucial role on the development of individuals who are prone to be successful sports man. Not only genetic factors, but also personal traits like hard-working, discipline, self and high motivation are some of the important factors that should be found in successful players or athletes and regardless to the nature of the sport they involve. By the help of those, we can say that athletic performance is under the effect of genetic and non-genetic factors. As of today, despite the improvements in technology, it is hard to analyse the non-genetic factors in the terms of sports genetics. But again as of today, we can analyse SNPs that effects human performance and thats what we do in sports genetics.

Starting from the beginning of 2000, the genes effecting human performance is increasing year by year. Approximately 250genes are considered to have effect on human performance. As the new molecular high-throughput techniques introduced to molecular genetics, it is now possible to analyse hundreds of SNPs in once. These genome-wide association studies (GWAS) led us have valuable information on the effect of these SNPs in sports science. Studies in this area are getting popular because of the informaiton gained by previous works.

Angiotensin-I Converting Enzyme (ACE) gene and the alpha-actinin-3 (ACTN3) are the most important genes on which most of the sport genetic studies accumulated on. The way that they effect cellular metabolism in athletic performance is now well understood and common polymorphisms on these genes are the canditate genes analyzed in sports genetics. Then the information gained by the analysis, help people to decide what kind of personal activities can an individual is ideal for. These individuals will have a greater level of improvement if they are trained according to their SNPs. Of course, by these times SNP numbers will increase and the scientific information gained by the results of these SNPs will help personal trainers to comment more easily on the individuals phenotypic traits.

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More studies in sports genetics will also help people to stay away from doping and gene-doping. As you train according to your genes, you will no longer need extra additional un-ethic application in sports science. By the help of these SNPs, the information will be stored as a genetic chip and every sports man will have a gene-card, which will be like biological passport and this will also avoid sports man from gene-doping. Another point in which sports genetic studies focus on injuries is especially tendinopathies, which is a great problem in competitive and recreational sports. They arise from intrinsic and extrinsic factors. In over use syndromes the cause is generally multi-factorial combinations of both intrinsic and extrinsic factors. Genes like COL1A1, COL5A1 code for the components of the machinery, SNPs found in these genes may cause sports men to be more susceptible to hard trainings. These individuals will also have different training programs, which will enable them to strength their opposite muscles to avoid the estimated injury. Researches in this sports genetics will also improve the team sports in the terms of more resistant body types. Here, the most important thing is the managing and sharing the results of these studies. It is going to be our further subject to form both national and international communities.

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## Conflict of interest

Author declares that there is no conflict of interest.