167 - GENETICS AND ATHLETIC PERFORMANCE

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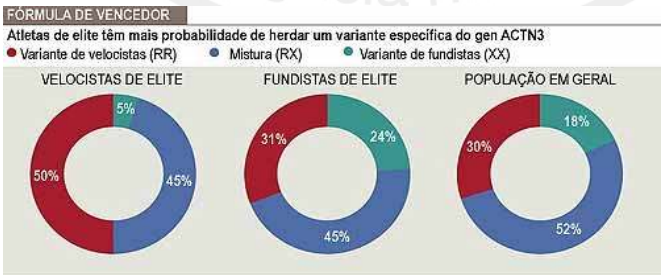
INTRODUCTION

There are more than 100 years Mendel had success with its explanations of particulate inheritance. Since the beginning has been trying to explain patterns of inheritance observed in populations. In current times is well known the structure and functioning of genes in molecular and genetic level expands to an amazing speed (BURNS & BOTTINO 1991: 01). Molecular genetics is used techniques of manipulation of genes in order to understand today's controversial topics. The technologies cause great impacts on society. The modern man longs increasingly become more fit, "without defects". The progress is linked to biological eugenics arguments that emphasize quantitative or qualitative characteristics. However worth emphasizing that not even the technological advances in genomic sequencing allow an immediate connection with many characteristics given the complexity of the individual's relationship with the environment. MOREIRA * (2002: 05) explains that the interaction explains that individuals are not human not inherit the features formed, but the genes that determine each gene and presents his standard reaction to the environment. There is no known standards of human reactions of genotypes on the environment, but realize it is different responses of the body to certain environmental stimuli, such as the increase in temperature. Some external stimuli may also act in the connections between neurons modulating functions of the nervous system. Many are the challenges faced by athletes over time. Scientists haunt of the sport with the performance capabilities of the human body, in search of sports talent, there are biological factors, psychological and social. FOSS & KETEYIAN (2000: 09) emphasize the importance of having a good understanding of systems and mechanisms of molecular mechanisms are highly relevant for understanding the functioning of the body. According GONÇALVES (1994: 146, 147):

Experience body is at the heart of the transformation of 'their own' in the course of our life and the completion of each movement. The body itself is not limited to our physical body (muscles, organs, tendons etc.), But it finds its possibilities and its limitations.

Ghorayeb & BARROS NETO (1999: 339) claim that the genetic variation allows the emergence of extreme population, who are endowed with some very characteristic that deviate from the average population. The sporting talents are a good example. Therefore, for these authors, the great genetic variability ensures greater availability of these super athletes, who have great or excellent conditions in a number of variables and extremely rare genetic combinations. Some of these variables seem to be highly dependent on genetic constitution, such as height, weight, fat, muscle strength, speed and anaerobic power (anthropometric variables, metabolic and neuromotor). Furthermore, FOSS & KETEYIAN (2000: 296) defend the idea that athletes born as such, are not made. However, the level of success or performance that they have only been achieved through a personal dedication to a training scheme in long-term well planned. The genetic endowment probably becomes even less important when discussing sports with specific skills such as golf, fencing and bow and arrow. NIEMAN (1999: 29) estimates that heredity is responsible for 25 to 50 percent of the observed variation in VO2 between people. Even the ability to improve aerobic fitness through training in the long term has a genetic factor. Some people can improve their aerobic fitness more than others due to genetic factors that favor. Recent studies have demonstrated the genetic influence on physical fitness. A specific gene linked to athletic performance was discovered by scientists at the Australian sport. The news came the public while the elite of the sport disputed the World Athletics Championship in Paris, rekindled discussions about whether athlete's peak may be recognized and prepared since birth. The gene has two variants. People with a variant are predisposed to become speed. People with the other most likely have to deploy in tests of strength. This is the second gene that seems to athletic ability. The first, the angiotensin-converting enzyme or ACE produces an enzyme that acts on muscle efficiency to capture and consumption of oxygen and the rate of hypertrophic certain muscles. The gene discovered by the Australian team is called alpha-ACTININ-3, or Actn3.

One version, the R allele, produces the ACTININ, a protein found only in fast muscle fibers. These fibers help to produce explosions of speed and power that require speed. The other allele, called X, does not produce ACTININ-3. The researchers studied the genetic profiles of more than 300 athletes, 50 of whom represented Australia at the Olympics or in international competitions in various sports. It was found that 95% had both copies, one inherited from each parent (American Journal of Human Genetics, vol. 73, p. 627).



Font: New Scientist

Some people inherit two alleles X, and thus do not produce any ACTININ. Only 5% of the speed had two copies of X allele, compared with 18% of the controls. According to the leader of the team, Kathryn North, the Neuromuscular Research Institute of Children's Hospital in Westmead, Sydney, no speed or elite Olympic had XX. However, when it comes to the corridors of evidence of resistance, a proportion higher than average, 24% had inherited the XX combination and so were unable to produce ACTININ-3. North says in his hypothesis that the absence of alpha-ACTININ-3 means that the muscles of an individual are more "slow" and more suitable for activities of resistance. The exact role of ACTININ-3 is uncertain. According to North, it can provide a greater capacity for absorption or transmission of force during a rapid contraction, forced. His team is conducting studies in animals and in the laboratory to confirm this assumption. The team from North, which includes researchers from the Australian Institute of Sport, claims that the Actn3 is particularly significant because the ACTININ form a part of the muscles, while the ACE only encodes an enzyme. Referring to this thought, says North:

"Although at least 73 genetic regions are associated with good form and performance, the Actn3 is the first gene structures, esqueletal, muscle for which such association was found" However, this interpretation is disputed by Hugh Montgomery, whose team at University College London discovered the ACE and now says it has not yet published evidence pointing to a third gene that predisposes to greater physical performance.

The ACE also has a direct impact on the muscles, according to Montgomery, because it influences whether they will be arranged muscle fibers "fast" or "slow". And as the Actn3, the ACE is inherited in two main ways: the way I, which encourages resistance, and form D, which promotes muscle explosion. Montgomery discards the idea that hunters can perform selections of talent in search of genetic future of elite athletes: "It is very unlikely that there is a single gene that is a great indicator of performance." He said that many factors influencing the success in the sport, including body size, type of fiber, metabolic efficiency, capacity of the lungs, psychological structure and implementation. "It's easier to go out with poachers of talent and choose the children who are doing well."

Team members from North accept that there is something more here: "Being an elite athlete to not depend entirely on the Actn3. It is highly doubtful whether we can use genetic markers to predict the performance."

"This search has not been made," attests Jason Gulbin, who coordinates the activities of olheiros the Australian Institute of Sport. "But if you discover a genetic profile useful for forecasting, then I would consider how this could be used for positive discrimination". Multitalentosos athletes have only a short period in which they must decide which sport is more appropriate in order to know the genetic predisposition to help make decisions about the best option. Gulbin rejects the idea that the gene could make the sport even more elitist:

"Let us not deceive us: the sport of elite is discriminatory. But not everyone can be a pilot; are certain skills required for performing specific tasks."

Rodney Walker, chairman of UK Sport, which oversees the development of sport in Britain, is more cautious. And consider that the assessment would only an indication, though potentially valuable, the promise of an athletic child. But the society as a whole, instead of the sport, you should judge whether the use of genetic evaluations is appropriate or desirable.

CONCLUSION

In the face of everything that was exposed, it is important to note that certain social and political environments that have lost the hope of obtaining social solutions to social problems have overvalued genetic arguments, ruling out the idea that the phenomena of human existence are always, and at the same time, social and biological and their explanation must involve both areas. Society is a human creation that adds new properties to the individual. The eugenics argument is perverse and unethical, because the wealth is made of genetic diversity, not of good and bad genes. The coexistence of differences with widens horizons promotes a more just and equal society. The social interaction provides an increase in potential and consequently contributes to the cultural advancement of mankind.

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GENETICS AND ATHLETIC PERFORMANCE

ABSTRACT

This text aims to analyze the genetic diversity, human differences, their influences and the relationship between genetics and athletic performance. Many authors have several studies about this knowledge. New researchers indicate specifics genes with determinate actions.

Key words: Genetics, specifics genes, athletic performance.

LA GÉNÉTIQUE ET DE LA PERFORMANCE ATHLÉTIQUE

RÉSUMÉ

Ce texte fait référence à la diversité génétique, les différences de l'homme, leur influence sur la société et de l'intime relation entre la génétique et de la performance d'un athlète. Plusieurs auteurs offrent de nombreuses études sur ces connaissances. De récents travaux de recherche met en lumière l'action des gènes spécifiques qui agissent dans certains lieux et de temps.

Mots clés: Génétique, des gènes spécifiques, les performances athlétiques.

LA GENÉTICA Y EL RENDIMIENTO DEPORTIVO

RESUMEN

Este texto se refiere a la diversidad genética, las diferencias humanas, su influencia en la sociedad y la íntima relación entre la genética y el rendimiento de un atleta. Varios autores ofrecen muchos estudios sobre este conocimiento. La investigación reciente pone de relieve la acción de genes específicos que actúan en determinados lugares y el tiempo.

Palabras clave: Genética, genes específicos, el rendimiento deportivo.

GENÉTICA E PERFORMACE ATLÉTICA

RESUMO

O presente texto refere-se à diversidade genética, as diferenças humanas, suas influências na sociedade e a íntima relação entre a genética e a performance de um atleta. Vários autores apresentam inúmeros estudos sobre este conhecimento. Pesquisas recentes destacam a ação de genes específicos que atuam em locais e tempo determinados.

Palavras-chave: Genética, genes específicos, performance atlética.