

SEARCH FOR NEW GENES DETERMINING THE PREDISPOSITIONS OF PHYSICAL PERFORMANCE

People have always been interested in what predisposes them towards particular activities. For a long time sports physicians, trainers and athletes themselves have wondered why some people are stronger, faster and more agile than others. Why do some athletes manage to succeed, whereas others are doomed to fail?

It is a well-known fact that success in sport is determined by a collection of environmental factors, e.g. the kind of training practised, training base, etc., as well as genetic factors which, to put it simply, are predispositions inherited from our ancestors. It was just until recently that the so called “genetic factor” was very difficult to define, and studies with regard to it were limited only to theoretical, mathematical calculations relating to the power of its potential influence on the particular trait image. It was only the latest scientific achievements which allowed to determine and comprehend information contained in human genes which are the primary source of variability among the above qualities that we are distinguished by.

The so called “genome determination studies” relating to sport trace their beginnings to 1998 when, for the first time, the association between one ACE gene polymorphism and an aptitude for sport was described. The studies, which have been carried out since then, allowed to single out “potential genetic markers” which may have influence on predispositions towards sport. However, these studies were flawed by the fact that they made use of the diagnostics methods which allowed to study one or several genes maximally in the context of their potential relationship with a sports status. As a result, due to methodological limitations, the studies, as such, were regarded as incomplete and, most certainly, they did not reflect the entire genetic image underlying predispositions to sport, which, in itself, excluded practical implementation of the results obtained when the studies were performed. However, this situation changed with the development of research technology which now allows to analyse the entire human genome (the so called sequencing) in one study.

Not only does the “new generation sequencing” proposed in this project allow to simultaneously study all the genes in one particular athlete under one study, but it also enables to determine interactions among particular genes, which will make it possible to recognise their factual role and influence on a series of traits of the human organism. Our plan is to complete the project in which, with the use of new generation sequencing, we intend to study the best Polish athletes whole physical effort is typically related to endurance as well as strength and time trials. We hope that the study planned in this way will allow to determine all genetic components which have influence on predispositions to practising particular sports among the Polish population athletes as well as provide a lot of valuable information on the issue of the molecular background determining processes which take place in the human organism. Undoubtedly, not only will this knowledge be of significant importance to sport, but also to public health and medicine as well.