

Abstract

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“WADA Program and Perspectives on Gene Doping Detection”

In 2001, WADA established an international program dedicated to promoting and coordinating scientific research in the field of anti-doping. From its inception, this program has consistently identified gene and cell therapy as a priority issue for research due to the potential for its abuse for performance enhancement in sport. Gene or cell doping, referring to the abuse of gene or cell therapy to enhance performance in sport, is considered to be one of the most difficult challenges facing the anti-doping scientific community.

At the time when WADA introduced the issue of gene and cell doping into its priority research program, the issue was more of an intellectual and futuristic concern than a reality. This was reflected by the absence of research funding requests in this category. However in 2005, WADA received 14 proposals in the category and accepted 5 of them. Today a total of 11 projects are being conducted in this category of gene or cell doping. Research on gene doping has rapidly evolved from a theoretical concept to a very structured activity that is monitored by the WADA Gene Doping Panel and by the Health, Medicine and Research Committee.

While there may be compelling reasons to be optimistic about the ability of science to develop anti-doping tests that will detect gene or cell doping, we currently face several key challenges. The first challenge is identifying the markers on which to establish such anti-doping tests. From the various levels of genomic, transcriptomic, proteomic and metabonomic, it is still unknown which will offer a sufficient specificity, sensitivity and window of detection to transfer into valid and practical anti-doping methods. Secondly, the limitation of the invasiveness or acceptable risk factors in healthy athletes, as compared to patients with medical conditions, may limit the technical margin and will inevitably necessitate the development of specific methods, therefore requiring substantial human and financial efforts from the anti-doping scientific community.

Although significant attention and resources have been dedicated by WADA to research in the detection of gene and cell doping, significant issues remain to be solved before future tests become available. Several technical approaches appear promising and deserve full investigation. However, the specific nature of gene and cell doping and the healthy population targeted will require specific and creative solutions in order to develop highly deterrent anti-doping methods.

How close are we today?