

**Natureza do trabalho:** Resumo

**TÍTULO**

*GENETIC DOPING AND THEIR MOLECULAR MECHANISMS: A REVIEW*

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**RESUMO**

**BACKGROUND:** High level athletes are in constant search for better sports performance, a fact that led them to ignore the concerns of their own health, directing them to the abuse of gene therapy techniques, known as genetic doping. **LITERATURE REVIEW:** Gene therapy is basically a technique for producing proteins from the insertion of a gene (transgene), which will replace a imperfect or defective gene, and represents a possible solution to diseases with ineffective or restricted treatments (as in the case of tissue injuries that are difficult to regenerate in high-level athletes). Physical training has proven to generate changes in several genes related to physical exercise, generating interactions between multiple genes that are modulated by multiple genetic variants. The use of these molecular mechanisms is already known, and some of the most studied are Leptin, Erythropoietin, IGF-1, Myostatin, VEGF, PPAR, among others. **CONCLUSION:** Although studies of gene therapy are still in phase of clinical trials and can represent several health risks, it is believed that these facts do not mean that athletes already have not made use of these techniques to enhance their athletic potential, considering the difficulties in detection and diagnosis.