PROJECT REVIEW

"Necessary Steps for the Application of an Integrative "Omics" Solution to the Detection of Recombinant Human Erythropoietin"

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The current research on the molecular signature of rHuEPO doping has, so far, provided some evidence that "omics" technologies such as transcriptomics have the potential to significantly strengthen the current ABP approach and contribute to other traditional anti-doping tests. This approach if successful can in the future be applied to the detection of other doping substances and methods difficult to detect such a recombinant human growth hormone and blood transfusions.

There is also the interesting possibility that an "omics"-based approach could help reduce the pressure on the anti-doping obligations of athletes such as the "athletes whereabouts". In order to confirm that an integrative "omics" approach is a possible solution to improve rHuEPO detection, it is of paramount importance to precisely determine normal gene expression reference values as well as to carefully assess the potential effects of external factors on blood gene expression profiles, such as prior training, altitude including different hypoxic "dose" and protocols, sport discipline, level of competition, gender, ethnicity and age. The investigations proposed are necessary before including the promising blood gene biomarkers in the ABP and/or the development of a stand alone test to reveal doping or identify suspicious samples for targeting purposes.