

## Doping Sciences: A Reflection upon Performance in Sports Medicine

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### Abstract

Doping science is a field in itself, evolving through processes of practice, education, research and administration, not only in sports but also to medicine, exercise and physical activity in health and disease. The objective of this editorial is to provide introduction to Doping science as a field, with necessities for future research and the role of JSMDs.

**Keywords:** Sports medicine; Exercise physiology; Doping science

The practice of blood doping in sports had been around for more than a century in its various novel forms the reason for which was not only that it enhances sports performance but also that it is difficult to detect [1]. Alfons Bukowski (1858-1921), a Polish pharmacist is commonly regarded as the pioneer of anti-doping research. In 1910, he developed the first method to detect alkaloids in horse saliva [2].

The fight against doping in sports commenced as a result of the death of a Danish cyclist during the Rome Olympic Games in 1960. The International Olympic Committee (IOC) established a Medical Commission (IOC-MC) which had the task of designing a strategy to combat the misuse of drugs in Olympic Sport. Thus Medicine and Science has now joined hands in their fight against doping [3].

After the fight against the use of performance-enhancing drugs for 90 years, the World Anti-Doping Agency (WADA) was formed in the year 1999, and with the support of various governments and bodies, the World Anti-Doping Program which consisted of five documents- the Code, the International Standard for Testing, the International Standard for Laboratories, the Prohibited List, and the International Standard for Therapeutic Use Exemptions [4].

The substances studied in doping sciences include but not limited to creatine supplements [5], recombinant human Erythropoietin (rhEPO) [1], Hypoxia-Inducible Factor (HIF) stabilizers [6], genome-wide RNA expression using microarray platforms and transcriptomic approaches [7], testosterone and epitestosterone using liquid chromatographic method [8], silicon doping system at research reactors [9].

In recent years, antidoping strategies underwent a significant development, from purely biochemical analyses and the detection of substances in urine samples to a biological approach, using blood samples, longitudinal monitoring, and probabilistic techniques [10]. Advanced urine analysis techniques such as Gas Chromatography-Mass Spectrometry (GC-MS), Liquid Chromatography-tandem Mass Spectrometry (LC-MS-MS), isotope ratio mass spectrometry detection of exogenous testosterone use, and isoelectric focusing detection of recombinant Erythropoietin (EPO) use were evolved to combat the socio-legal implications of doping [11].

The science of doping and its preventive initiatives will necessitate further state-sponsored research, at a global magnitude, to address this exploding phenomenon in the field of sports medicine [5]. Thus researchers focusing on anti-doping should conform to statistical standards derived from Forensic science [12].

Journal of Sports Medicine and Doping Sciences (JSMDs) welcomes all articles on doping and its evolution of scientific information for evaluation, identification, measurement, interpretation, regulations and implications, both at a regional and at a global level.

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