COMPARISON OF HIGH PERFORMANCE LIQUID CHROMATOGRAPHY AND GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR THE ANALYSIS OF LOW LEVEL OF SOME DRUGS IN BIOLOGICAL FLUIDS

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The rising demand for drug testing comes from societies' pressures to the stem the spread of substances abuse and to provide greater protection to their members. In response to this demand urine analysis testing programmers have been implemented by a wide variety of organization such as business and industrial employers, the transportation industry, police and fire departments, the military and sports.

In order to improve the sports performance (physical, condition, sport skills, muscle strength) administration of the substances and use of methods except natural capacity, exercise and nutrition in called ergogenic aid. Ergogenic aids are physiological (basic salts, blood doping), psychological (hypnosis, stress therapy), mechanic and biomedical (body composition, clothes and material), nutritious (carbohydrates, amino acids, vitamins) and pharmacological substances (banned and permitted). Pharmacological and psychological substances are also called as doping. Doping can be defined as the use by or distribution to an athlete of certain substances that could have the effect of improving artificially the athlete's physical and/or mental condition and so unfair manner his athletic performance. Doping consists of the administration of substances belonging to the banned classes of pharmacological agents and/or the use of various prohibited methods. Forbidden classes of substances are stimulants, narcotics, anabolic agents, diuretics, peptide and glycoproteine hormones and their analogues. Prohibited methods are blood doping and pharmacological, chemical and physical manipulations. Classes of drugs subject to certain restrictions are alcohol, cannabinoids, local anesthetics, corticosteroids and beta-blockers. Doping classes covers the determination of all these banned groups by using analytical methods based on high technology.

Mass spectrometry is arguably the most powerful technique for the analysis of organic compounds. It is now applicable to a wide range of different types of analyte with recent developments being particularly concerned with compounds of bioanalytical interest. When the purchase of a mass spectrometry is being contemplated for the first time one of the major consideration is whether to evaluate bench-top instruments which, by definition, have limited performance and upgrade pathways, or to consider and instrument with greater versatility and higher specification.

The decision regarding instrument type will depend upon a number of factors both financial and scientific, arguably the most important in the latter category being the range of analyses for which the instrument will be require in both the short and long term. Similar considerations are appropriate when the existing mass spectrometry facilities within a laboratory require replacing or extending.

This article intended to give some assistance with these deliberations by providing an insight into the ways in which the increased specificity afforded by a modern instrumental techniques such as high performance liquid chromatograph, gas chromatography - mass spectrometer and high resolution mass spectrometry.