

MASS SPECTROMETRY TECHNIQUES USED IN SPORTS ANTI-DOPING PROGRAMMES

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The IOC developed their International Olympic Committee Medical Code which outlines procedures for carrying out dope control. The IOC Code defines the categories of drugs banned. There are lists of substances associated with these categories but these are in fact open ended to allow for the development of new drugs. Thus drugs which are chemically or pharmacologically related are also banned (For the code see <http://www.olympic.org>).

Detection of some newly developed drugs which have been placed on the banned list offers a major challenge to laboratories involved in Sports Dope testing and in some cases requires research into new applications of instrumental techniques. Research topics identified as requiring special attention include:

- Continuous monitoring of population values for endogenous substances
- Instrumental techniques for detection of drugs
- Sample cleanup techniques to allow mass spectral identification of drugs at low levels in urine
- Differentiation of endogenous from administered substances
- Detection of the use of peptide hormone doping agents
- Preparation of reference substances and availability of certified materials.

Many of these involve the novel use of GCMS techniques including HRMS, Carbon Isotope Ratio Mass Spectrometry, and LC/MS. How these are used to provide data to enable cheats to be caught will be discussed.
