

# New test makes cheating with drugs in sports easier to detect

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## Research news from Journal of Mass Spectrometry

A new mass spectrometry test can help sports anti-drug doping officials to detect whether an athlete has used drugs that boost naturally occurring steroid levels. The test is more sensitive compared to previous alternatives, more capable of revealing specific suspicious chemical in the body, faster to perform, and could be run on standard drug-screening laboratory equipment. The new test is announced in a special issue of the *Journal of Mass Spectrometry* that concentrates on detecting drugs in sports.

One of the roles of the masculinising hormone testosterone is to increase muscle size and strength. Taking extra testosterone, or taking a chemical that the body can use to create extra testosterone, could therefore enhance an athlete's performance. For this reason taking it is banned by the World Anti-Doping Agency (WADA).

The exact level of testosterone varies considerably between different people, so simply measuring total testosterone in an athlete's urine can not show whether he or she has deliberately taken extra. There is, however, a second chemical in the body, epitestosterone, which is normally present in approximately equal proportions to testosterone. Comparing the ratio of testosterone to epitestosterone can then indicate whether testosterone or a precursor has been taken.

The problem is that it is not always easy to measure these two substances, particularly as they are only present in urine at very low

concentrations.

A team of scientists the Sports Medicine Research and Testing Laboratory at the University of Utah have developed a test that makes use of liquid chromatography-tandem mass spectrometry. This method has incredibly high sensitivity (down to 1 ng/ml) and increases the power with which officials can search for both testosterone and epitestosterone within a sample.

"Our system means that we can determine the testosterone/epitestosterone ratio in a sample with greater confidence, and therefore be in a better position to spot doping violations without falsely accusing innocent athletes," says lead investigator Dr Jonathan Danaceau.

"Not only is the test more sensitive, it is also faster to perform," says colleague Scott Morrison.

"Having this sort of test available makes cheating harder and lets us take one more step towards enabling free and fair competition," says Laboratory Director Dr Matthew Slawson.

Source: Wiley-Blackwell

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