

PROJECT REVIEW

“Improving the Traceability of Steroid Abuse by Introduction of $2\text{H}/1\text{H}$ -Analysis of Urinary Steroids”

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Stable isotope techniques are successfully employed to detect doping with synthetic steroid hormones such as testosterone or its precursors. The test exploits the fact that synthetic testosterone exhibits a different ratio of the stable carbon isotopes ^{13}C and ^{12}C compared to its natural counterpart. However, the $^{13}\text{C}/^{12}\text{C}$ ratio is also influenced by diet and other factors. In some regions the natural $^{13}\text{C}/^{12}\text{C}$ -ratio of steroid hormones is close to that of synthetic material. This is due to the $^{13}\text{C}/^{12}\text{C}$ -ratios of the diet. Testosterone doping thus can go undetected under these circumstances.

The other element present in all steroids is hydrogen. Like carbon it has two stable isotopes, ^1H and ^2H . The $^2\text{H}/^1\text{H}$ -ratio is probably better suited to discriminate between synthetic and natural testosterone. Especially when the $^{13}\text{C}/^{12}\text{C}$ -test fails it can be expected that the $^2\text{H}/^1\text{H}$ -ratio can still betray the presence of synthetic steroids.