

United States Anti-Doping Agency

Funding Proposal

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Doping, the use of substances that can enhance an athlete's performance, persists as a problem in modern professional sports.¹ Athletes in an array of sports push their bodies to limits that set records and propel them to become the best. To achieve these goals, many provide their bodies with external performance enhancers, granting them an edge over others who rely solely on natural physical training. Arguably, doping allows athletes to surpass even the natural limits their bodies place on them: Australian Stuart O'Grady called Floyd Landis' performance in Stage 17 of the 2006 Tour de France “impossible” as Landis recovered eight minutes to finish second overall.^{2,3} Clearly, doping is a deviation from the norm and elicits resentment and animosity from other athletes.

It is the United States Anti-Doping Agency's (USADA's) responsibility to ensure that our athletes meet the highest anti-doping standards expected of them in competitive sports. To do so, the USADA must maintain strict and clear protocols for testing to consistently catch dopers and thereby deter doping. Since its institution in 2000, the USADA has seen a myriad of cases, averaging about seven unique cases per year, each challenging the agency's test results.⁴ Many athletes cite particular technicalities in protocols, improper specimen handling, and lack of scientific credibility to dismiss allegations of doping.

Therefore, to minimize procedural flaws and to maximize testing integrity, I recommend that the USADA's funding be increased on the condition that it develops more credible and reliable anti-doping science and keeps abreast of the latest (anti-)doping technologies. My specific recommendations to improve anti-doping science and testing follow in sections 1 – 3. I offer a financial perspective in section 4 and briefly relate my recommendations to adjudication in section 5.

1. Creating reliable science.

In 2004, cyclist Tyler Hamilton contested the results of his doping tests, which stated that he had engaged in homologous blood transfusions to increase his red blood cell count and therefore the amount of oxygen his blood could carry. An assay of his red blood cells revealed the presence of mixed populations of three different blood cell markers. Hamilton's legal team rejected the positive result, stating, “The validation studies of this brand new test are limited, incomplete, and unsatisfactory.”⁵

1 <http://www.nbcolympics.com/trackandfield/insidethissport/glossary/newsid=112821.html> Retrieved: 6 Nov. 2008

2 <http://sixtyminutes.ninemsn.com.au/article.aspx?id=279595> Retrieved: 8 Nov. 2008

3 <http://sports.espn.go.com/oly/cycling/columns/story?id=2871865> Retrieved: 9 Nov. 2008

4 <http://www.usantidoping.org/what/management/arbitration.aspx> Retrieved: 5 Nov. 2008

5 http://www.usantidoping.org/files/active/arbitration_rulings/CAS%20Decision-Tyler%20Hamilton_Feb2006.pdf Retrieved: 6 Nov. 2008

It is known that the World Anti-Doping Agency (WADA) regime calibrates its tests based upon a small group of volunteers taking the substance in question. Because of this, tests often show high margins of error. In order to render the tests more legitimate, the USADA should invest in larger sample sizes, including both known dopers and non-dopers to provide effective standards of comparison: the former group should display test readings significantly deviant from the latter group.⁶

The tests should be made even more relevant by identifying systemic errors. Test validation should be diversified to other countries, using large sample sizes of people with different ethnic backgrounds. Furthermore, tests conducted by different groups of scientists will reveal ambiguities in protocols, deviations caused by equipment, and other uncontrolled variables. USADA can channel some of its funding into foreign laboratories to encourage adoption of these new validation procedures.

The USADA is justified in keeping its science a secret because biochemistry does display levels at which detection is no longer useful, such as when a dilute doping agent prevents effective binding of a detector molecule. Making such limits publicly available will provide cheaters the information necessary to circumvent the test. Peer review of the science behind the tests, however, is still encouraged strictly within WADA's network of scientists, who can best validate the scientific discoveries made.

Lastly, the USADA needs to be reasonable with its error bounds. It must consider the fact that an extensive review process was not utilized and that large-scale human-testing was not possible. USADA should provide generous margins of errors for its tests. In this way, the USADA is pressured to make the best use of the recommendations above while safeguarding athletes from normal deviations that may occur from random errors in the laboratory.

2. Better tracking of samples and protocols.

In 2006, cyclist Floyd Landis challenged the Laboratoire National de Dopage's (LNDD's) detection of exogenous testosterone in his body on the premises that proper protocol had not been followed in detecting proper testosterone:epitestosterone (an inactive epimer of testosterone with a stable relative concentration) ratios, that the specimen was tampered with, and that data was potentially falsified.⁷ Similar challenges caused the dismissal of the charges against American sprinter

⁶ <http://www.nature.com/nature/journal/v454/n7205/full/454667a.html> Retrieved: 8 Nov. 2008

⁷ http://www.usantidoping.org/files/active/arbitration_rulings/LandisFinalDissent.pdf Retrieved: 8 Nov. 2008

LaTasha Jenkins.⁸

To prevent technical errors and to hold the laboratories more responsible of protocols, I recommend that the USADA implement information systems that will track, within a database, exactly who was handling a specimen, why it was being used, a copy of the procedures followed, results, any concerns from a test, and change-logs of a person's file. Scientists will "sign-off" any interaction with a specimen or data.⁹ Rules can be created that prevent technical errors, such as preventing the same person from attempting to test the same subject's sample twice. Procedural information is highly valuable in evaluating protocol claims and can demonstrate clear adherence to protocols.

Funds should be used to build and purchase the appropriate information technology. Funds should also be sent down the channel of sample collection to document all stages of collection and transportation back to the USADA or its laboratories.

3. Implementing the Athlete's Passport

The USADA should also continue to be aware of the latest doping trends and counter them with more innovative methods of detection. One such method is the Athlete's Passport, which is a monitoring of selected biochemical blood parameters that characterize an athlete's internal chemistry.¹⁰ The Passport can indirectly reveal the effects of doping, as opposed to directly testing for particular doping agents, while also providing athlete-specific standards from which to identify deviations from normal. Tracing an athlete's biology throughout his/her life will render doping harder to implement because screens will simply test for common symptoms of doping. Furthermore, it will prevent athletes, such as Landis, from making claims such as "naturally high testosterone levels."¹¹

The WADA has already come to a consensus on the parameters and analyses to be incorporated in the Passport.¹² USADA funds should be used to invest in blood processing equipment that can achieve economies of scale by processing many athletes' samples at once.

8 [http://www.usantidoping.org/files/active/arbitration_rulings/AAA%20CAS%20Decision%20-%20LaTasha%20Jenkins%20January%202008\[2\].pdf](http://www.usantidoping.org/files/active/arbitration_rulings/AAA%20CAS%20Decision%20-%20LaTasha%20Jenkins%20January%202008[2].pdf) Retrieved: 6 Nov. 2008

9 A successful implementation of such a system, called the Developer's Certificate of Origin, is used by the Linux Kernel software development team and has proven successful in combating "compromised" code from being submitted. <http://kerneltrap.org/taxonomy/term/245> Retrieved: 9 Nov. 2008

10 <http://www.wada-ama.org/en/dynamic.ch2?pageCategory.id=754> Retrieved: 9 Nov. 2008

11 http://news.bbc.co.uk/sport2/hi/other_sports/cycling/5225470.stm Retrieved: 9 Nov. 2008

12 *Ibid.*

4. Financial considerations and the Net Present Value rule.

The hefty proposals set forth in this paper will admittedly be costly, but over the period of life of a project (a particular anti-doping protocol), quantifiable value is gained. This suggests that Net Present Value (NPV) methods, in which the present value of future cash inflows and opportunity gains are netted against the present value of expenditures, can demonstrate the financial reasonableness of funding an organization not intended to generate revenue.

The proposals are intended to create accurate anti-doping science with such strict rules for testing positive that arbitration and court hearings are no longer necessary or are short because accurate documentation of testing is available. The opportunity gains from avoiding legal fees can be considered positive cash inflows.

In addition, strong anti-doping measures in the United States produce several collateral benefits. Foremost, the USADA has the potential to help maintain athletes' health by deterring doping and stopping doping once detected. In particular, the Athletic Passport has the potential to detect irregularities early in an athlete's life and prompt effective medical intervention.¹³ Although maintaining health is not an opportunity gain for the USADA, it does have value captured in the form of reduced long-term healthcare costs associated with doping.

The USADA can also promote educational value. By demonstrating consistency in catching dopers, it encourages aspiring athletes to remain clean. In order to value this effect, the USADA can estimate what it would have otherwise cost them to market their anti-doping standards.

More interestingly, there is value in maintaining international accord and respect amongst other nations. Sports are one way to put politics aside and demonstrate human equality and decency; it is partly the USADA's responsibility to protect the United States' image abroad. Politically, this potentially translates into leverage in the international arena and credibility amongst other nations. Economically, it may prevent social boycotting of American goods. Socially, as people of a nation are often judged by the actions of its governmental institutions, the USADA can help ensure that Americans are treated respectfully abroad. A calculus can likely determine the value in these considerations but is beyond the scope of this paper.

Thus, by a simple NPV accept/reject rule, USADA projects can be deemed substantial (with a positive "implied-value" NPV) and funding should be approved.

13 <http://www.wada-ama.org/en/dynamic.ch2?pageCategory.id=754> Retrieved: 9 Nov. 2008

5. Semantics and adjudication.

Overall, the reason USADA funding must be increased is to maintain the burden of proof upon the anti-doping science. Semantics are important, and the current charter suggests that the USADA will default to charging an athlete as a doper after a test returns positive, placing heavy mental and financial burdens on athletes who must then review science and protocols currently ridden with flaws.¹⁴ The null hypothesis must remain that the athlete is innocent, and the USADA has the burden of verifying its test procedures, specimen integrity, and data validity. This can be accomplished if my recommendations are enacted.

The increase in funding I recommend for the USADA will elevate the credibility of the institution and provide it with the legitimacy to take action against cheating athletes. It will help preserve the meaningfulness of sports and preserve an American reputation for fairness, responsibility, and innovation. By adhering more closely to scientific standards, accurately documenting lab procedures, and furthering new detection schemes, the USADA can create value that yields positive NPV projects. The agency can ensure the integrity of clean athletes while taking action against those who are clearly cheaters.

¹⁴ <http://www.usatf.org/about/legal/antidoping/usadainfo.asp> Retrieved: 6 Nov. 2008