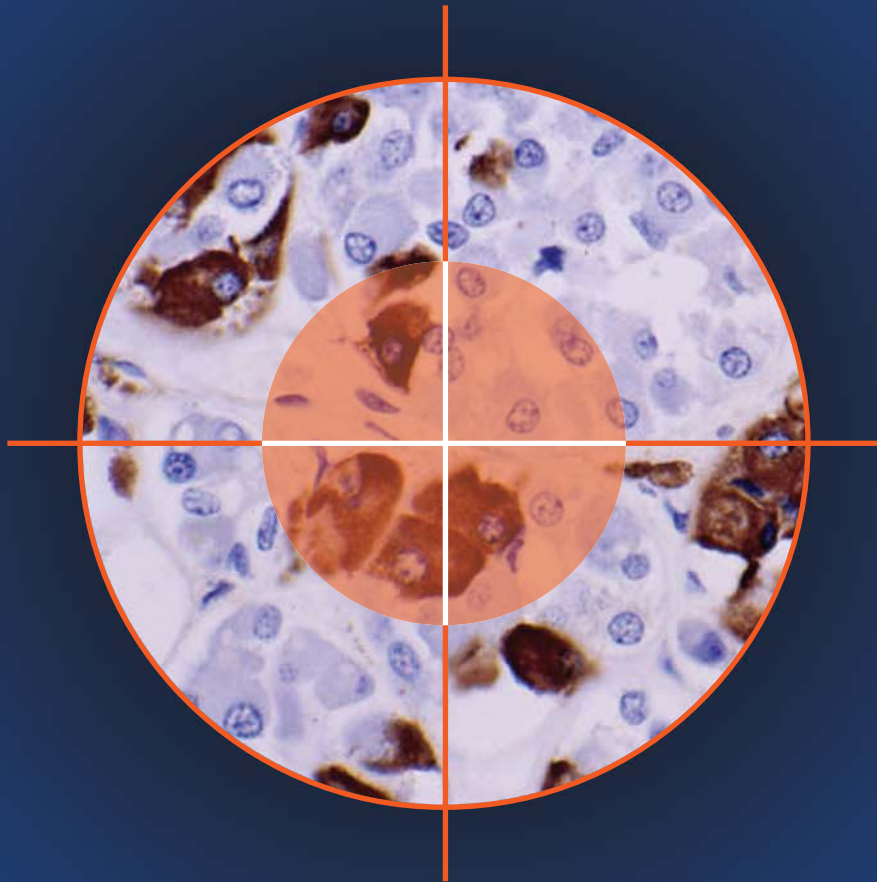


# play true

ISSUE 2 - 2007

AN OFFICIAL PUBLICATION OF THE WORLD ANTI-DOPING AGENCY



## Science Honing in on Doping

WADA's research budgets have created a stable and significantly increased source of funding for anti-doping scientists, accelerating the development of new detection approaches and putting dopers squarely in their sights.

# play true

AN OFFICIAL PUBLICATION OF THE WORLD ANTI-DOPING AGENCY

## CONTACT:

**THE WORLD ANTI-DOPING AGENCY**  
E-MAIL: [info@wada-ama.org](mailto:info@wada-ama.org)  
URL: [www.wada-ama.org](http://www.wada-ama.org)

## HEADQUARTERS

800 PLACE VICTORIA - SUITE 1700  
P.O. BOX 120, MONTREAL, QC  
CANADA H4Z 1B7  
TEL: +1 514 904 9232  
FAX: +1 514 904 8650

## AFRICAN REGIONAL OFFICE

PROTEA ASSURANCE BUILDING  
8TH FLOOR  
GREENMARKET SQUARE  
CAPE TOWN  
8001 SOUTH AFRICA  
TEL: +27 21 483 9790  
FAX: +27 21 483 9791

## ASIA/OCEANIA REGIONAL OFFICE

C/O JAPAN INSTITUTE OF SPORTS SCIENCES  
3-15-1 NISHIGAOKA, KITA-KU  
TOKYO  
115-0056 JAPAN  
TEL: +81 3 5963 4321  
FAX: +81 3 5963 4320

## EUROPEAN REGIONAL OFFICE

AVENUE DU TRIBUNAL-FÉDÉRAL 34  
1005 LAUSANNE  
SWITZERLAND  
TEL: +41 21 343 43 40  
FAX: +41 21 343 43 41

## LATIN AMERICAN REGIONAL OFFICE

WORLD TRADE CENTER MONTEVIDEO  
TOWER II  
UNIT 712 - 18TH FLOOR  
CALLE LUIS A DE HERRERA 1248  
MONTEVIDEO, URUGUAY  
TEL: +598 2 623 5206  
FAX: +598 2 623 5207

## EDITOR

ELIZABETH HUNTER

## CONTRIBUTORS

JULIE CARTER                      JAMES ROACH  
FRÉDÉRIC DONZÉ                JENNIFER SCLATER  
ELIZABETH HUNTER            STACY SPLETZER

## TRANSLATIONS

FRÉDÉRIC DONZÉ

## PHOTOS

JOONAS EKESTRÖM (TANJA KARI PROFILE)

## DESIGN AND LAYOUT

ANTHONY PHILBIN COMMUNICATIONS

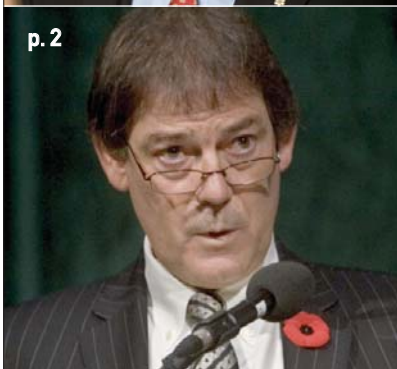
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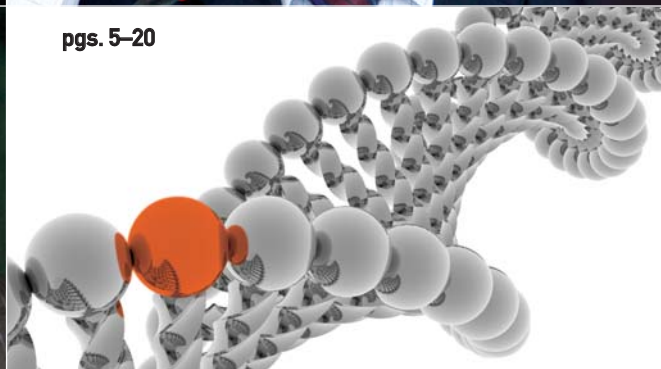
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## Code Compliance: The Time Is Now

Code signatories take note: your Code compliance report card will be made public next year. If your sport or anti-doping organization is not yet Code compliant, now is the time to get your house in order.

The World Anti-Doping Code assigns WADA the responsibility of formally reporting on stakeholder compliance every two years. Our first report will occur in November 2008. In lead-up to

the organization undertakes a process of reviewing its policies and rules governing its activities and amending them to include the mandatory articles and principles of the Code and related International Standards. This involves attending to all aspects related to the fight against doping in sport including, but not limited to, ensuring that the rules for managing doping control results follows the universally accepted procedures, there is an

Some have taken on the fight against doping in a very resolute manner. Because of their firm and decisive action in confronting doping, these ADOs and IFs stand a far greater chance in terms of safeguarding their sports' and anti-doping programs' integrity and credibility. And their athletes stand a far greater chance of experiencing the joy of fair and honest competition, without any

**We will report publicly on compliance by the end of 2008, and I encourage every one of your organizations to take a hard look at your rules and programs today and contact WADA should you have any questions or require assistance so that you are fully compliant and can be reported as such.**

this, WADA's Executive Committee has directed WADA to prepare a preliminary report for the September 2007 executive meeting, reporting on the status of each anti-doping organization (ADO) and International Federation (IF) vis-à-vis Code compliance.

Let's first clear up any confusion that might exist about what exactly compliance entails. There are three "steps" to becoming compliant: acceptance, implementation and compliance. When an organization *accepts* the Code, it agrees to the principles of the Code and that it will use the Code as the basis for its anti-doping program, rules and regulations. Code acceptance is an important public statement, but it is only a first step that means very little without putting action to those words through implementation and compliance.

During the *implementation* phase,

appropriate mechanism in place for reviewing and granting therapeutic use exemptions, and, for IFs in particular, there is an out-of-competition testing program as defined by the Code.

Implementation is another important step, and is no minor task, but in the end amounts to little if there is not full compliance. An ADO or IF is Code-compliant only when its policies and rules are in line with the Code, and it is applying and enforcing them.

Given that the Code was approved in 2003 and that it came into force in January 2004, one might reasonably expect all ADOs and IFs to have achieved full Code compliance by now. Particularly since the Code, in its current form, is the result of extensive drafting and consultation with, as well as final approval from, all stakeholders including ADOs and IFs, a process which began as early as 2001.

clean athlete ever considering resorting to doping in order to "level the playing field."

Others, whose authorities systematically have turned a blind eye to doping over the years, now find themselves in desperate situations calling for extreme measures to salvage what good might possibly remain, as evidenced by recent headlines.

Between these two extremes, there are those stakeholders that have taken some measures and are compliant in some areas while not so in others.

Whatever the case may be, now is the time for all Code signatories to act, and WADA can help. We have programs and activities in place, operating on a daily basis, that are intended to assist stakeholders in meeting their Code requirements.



## Progress Based on Research

We review stakeholders' rules and provide models of best practice and guidelines to facilitate implementation. Model rules have been developed for IFs, National Federations, National Olympic Committees, National Anti-Doping Organizations and Major Games Organizers. Guidelines are available for, among other activities, result management, out-of-competition testing, whereabouts information, therapeutic use exemptions, blood and urine sample collection, and education programs.

In addition to the assistance in relation to rules and processes, we monitor sanctions, appealing decisions that are not in line with the Code. To help ensure there are Code-compliant anti-doping programs worldwide, we foster the establishment of Regional Anti-Doping Organizations (RADO), and so far have helped to bring more than 100 countries into the fold. We have proposed the development of an IF anti-doping organization, based on the RADO model, so that some of the smaller sports can share resources in the fulfillment of their Code requirements.

We will report publicly on compliance by the end of 2008, and I encourage every one of your organizations to take a hard look at your rules and programs today and contact WADA should you have any questions or require assistance so that you are fully compliant and can be reported as such.

Doping is the greatest danger facing ethical sports today, and the consequences of not facing this danger head-on through Code compliance can be far-reaching, including non-participation in the Olympic Games. ■

I am pleased to provide a brief introduction to this issue of *Play True* in which we highlight some of the recent advances in the science of detection as a result of WADA's scientific research program. Common themes you will read about are the relative scarcity of funds for anti-doping research, the significant impact WADA's research program has made in spite of this and in a relatively short period of time, and the value of partnership and collaboration.

WADA's program was established in 2001, and has since devoted more than US\$31 million to

recently hGH. Still, we know that more can be done and recognize the need to continue to cultivate champions, forge partnerships with our stakeholders and seek collaboration from outside the traditional anti-doping movement.

For this issue we interviewed several individuals who have indeed championed the need for a dedicated research program or who have contributed significantly to our ability to detect doping through their own research activities. I want to take this opportunity to recognize their invaluable work, without which there could be no legitimate fight

**For an international agency with an annual budget of approximately US\$23 million, close to 30 percent of the total budget for scientific research is a significant commitment. It has been a worthwhile investment, resulting in our ability to detect a number of performance enhancing drugs, such as the designer steroid DMT and more recently hGH.**

scientific research. This year we committed US\$6.6 million to the program. For an international agency with an annual budget of approximately US\$23 million, close to 30 percent of the total budget for scientific research is a significant commitment. It has been a worthwhile investment, resulting in our ability to detect a number of performance enhancing drugs, such as the designer steroid DMT and more

against doping in sport. There are many others too who have dedicated themselves to scientific study in the field of anti-doping, or who have used their expertise in other highly specialized areas, to the service of the fight against doping in sport. WADA and its stakeholders are grateful for this work and for the partnerships created, which allow us to become more and more efficient at deterring and detecting doping. ■



# Championing the Science

## A Conversation with Arne Ljungqvist

**Prof. Arne Ljungqvist**, who represented Sweden in high jump at the Games of the XV Olympiad in Helsinki in 1952, has dedicated his career to the health of athletes. He has held several influential posts in the field of sport and anti-doping, including chairmanship of both the IOC's and the IAAF's Medical Commissions. As chairman of WADA's Health, Medical and Research Committee and member of WADA's Executive Committee, Prof. Ljungqvist has played a pivotal role in the development of science and research to combat doping in sport. *Play True* met up with Prof. Ljungqvist during his recent meetings in Montreal to solicit his thoughts on the current state of anti-doping research and what promises it may hold for the future of safe and fair competition.

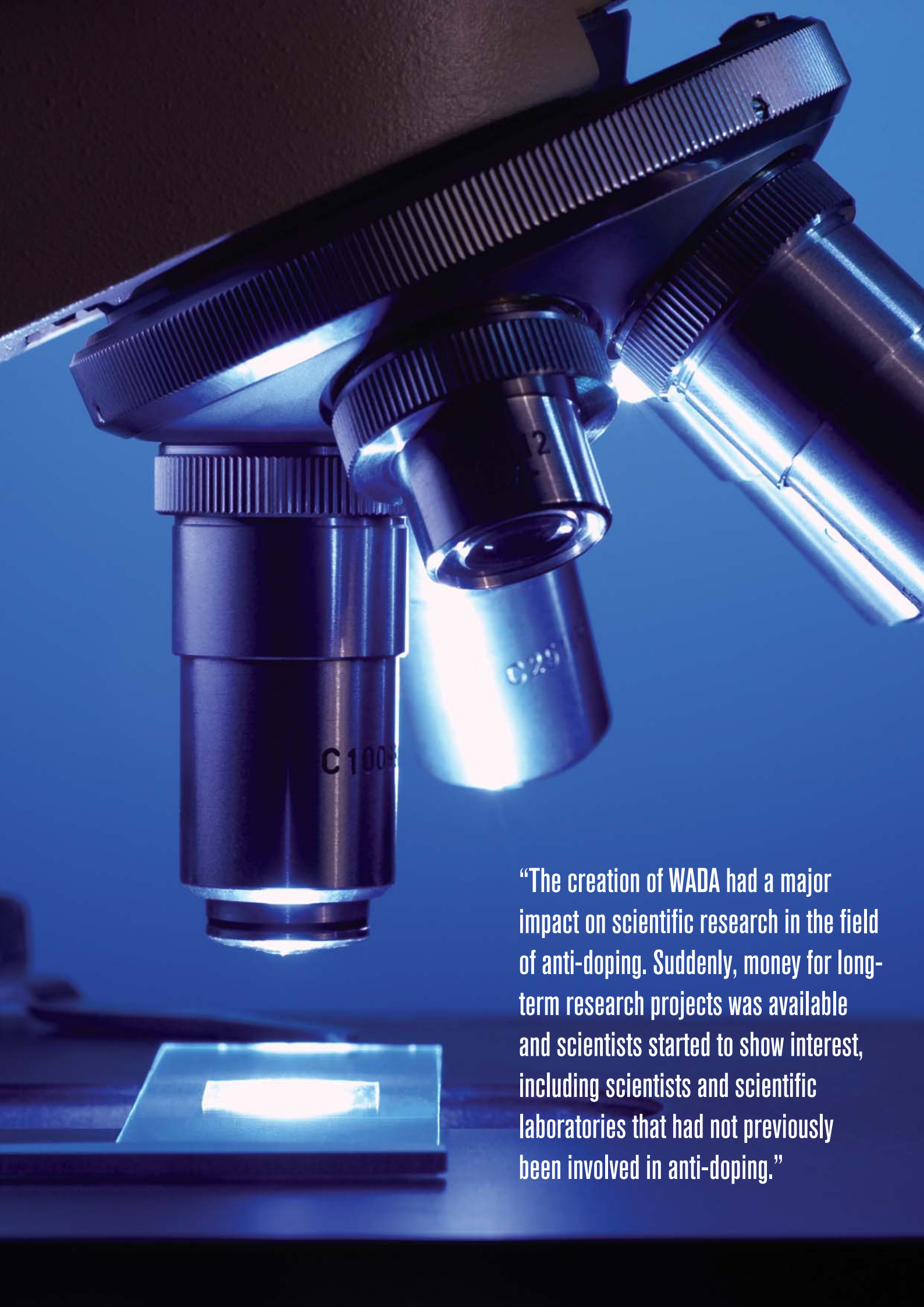
**Play True:** Given your experience over several decades of anti-doping, how do you perceive the impact of WADA on anti-doping research?

**Prof. Arne Ljungqvist:** The absence of an internationally available research fund for anti-doping was a major stumbling block in the fight against doping ever since the beginnings, back in the 1960s and 1970s. Decades ago, I raised the issue with the International Olympic Committee (IOC), in particular its Medical Commission chairman at the time, Prince de Mérode, and the IOC president himself. Some local (domestic) funds were available in a few countries but practically nothing at the international level.

In the absence of other funds, the IAF (International Athletic Foundation), which was established in 1988, funded some research in the field in the

1990s. In particular, the IAF supported research conducted by the Cologne laboratory for the creation of a library of reference substances for the identification of steroid metabolites.

The creation of WADA, therefore, had a major impact on scientific research in the field of anti-doping. Suddenly, money for long-term research projects was available and scientists started to show interest, including scientists and scientific laboratories that had not previously been involved in anti-doping. Sport today is a multi-billion dollar business. No enterprise of that size would produce a budget without a substantial part of it being allocated for research and development. The WADA budget for research into anti-doping is a major part of WADA's budget, yet it is still a minimal fraction of the financial return in global sport.



“The creation of WADA had a major impact on scientific research in the field of anti-doping. Suddenly, money for long-term research projects was available and scientists started to show interest, including scientists and scientific laboratories that had not previously been involved in anti-doping.”



“We support projects for the development of techniques for the detection of new substances before they arrive on the market, just as we support projects intended to improve already existing analytical methods.”

**How does WADA’s Health, Medical and Research (HMR) Committee determine priority themes for research funds?**

We base our decisions on intelligence, experience and our understanding of the evolution of science.

Examples of intelligence are those projects that are based on the seizure of designer drugs and the development of methods for their detection.

Experience tells us that athletes are ready to try the latest. Therefore, we support projects for the development of techniques for the detection of new substances before they arrive on the market, just as we support projects intended to improve already existing analytical methods.

Examples of the understanding of the evolution of science are the support of projects intended to develop methods for the detection of gene doping. The risk that gene transfer technology may be misused for the purpose of doping is obvious to us, although it may not be there yet. But better to be proactive than reactive.

**Can you illustrate how the gap is closing on cheaters?**

Let me take human growth hormone (hGH) as an example. There is evidence that hGH has been used for the purpose of doping for more than 20 years, despite the fact that the substance at that time was extremely expensive and the supply very short. The reason for the high cost and limited supply was the fact that the hormone could only be obtained by

## Science and Research

# Essential Partnerships

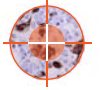
WADA devotes a significant portion of its resources to scientific research. Nevertheless, these resources, which are inevitably limited, cannot alone guarantee the effectiveness of anti-doping research programs worldwide. Therefore, WADA, as the coordinator of the fight against doping, works in partnership with a number of organizations—including International Sports Federations (IFs), governments and National Anti-Doping Organizations (NADOs)—that provide valuable expertise and resources in the field of research.

For example, WADA has worked in close cooperation with USADA to implement a test for growth hormone, and the two organizations are currently working together on projects linked, among other things, to genomics and proteomics—the study of the modification of genes and proteins through the exogenous intake of substances. Serving as another example is the partnership with the Agence française de lutte contre le dopage to co-fund research projects linked to metabolomics—the study of changes in a number of biochemical parameters in

human fluids following the intake of doping substances. Several NADOs fund their own scientific research projects, often in conjunction or in liaison with WADA.

IFs also partner with WADA on research, the most recent example being the development of the Athlete’s Passport, a project that aims to examine the biological parameters of athletes over a certain period of time in order to identify abnormal profiles in the context of the fight against doping (see *related article*, page 19). In addition, WADA promotes anti-





extracting it from the hypophysis of dead people. With the arrival of modern genetic-based technology for the production of hormones, growth hormone suddenly became readily available.

In 1996 the IOC initiated a project for the development of an analytical method for the detection of growth hormone doping—GH 2000. The intention was to have a method in place prior to the 2000 Olympic Games. Due to difficulties in funding the project, the aim could not be fulfilled.

Now, with the WADA research fund available we also have the basis for a detection method in place (see *related article, page 15*), as we have for the detection of, for example hemoglobin-based oxygen carriers (HBOC), homologous blood transfusions and other substances or methods. This rapid progress would in all probability not have been achieved in the "pre-WADA time."

Further examples of the closing of the gap are the findings at the Salt Lake City Olympic Games in 2002.

Three athletes were found doped with an analog of erythropoietin (EPO)—Aranesp—and which had been on the market for only a few months. Probably, those involved in the athletes' doping did not believe that there was already a method in place for the detection of the substance. But it was, very much thanks to a fruitful collaboration with the producer of the substance. Therefore, we consider it very important to continuously develop the collaboration with the pharmaceutical industry (see *related article, page 5*).

### What is the greatest challenge in the field of anti-doping research?

To keep up with the accelerating introduction of new drugs on the market. And not just new in the sense that they are more efficient and with fewer side effects than their predecessors but truly new in the sense that they work in a completely new way. A good example would be those drugs that the medical community hopes to have available within a near future for the purpose of gene therapy.

*Continued on page 8.*

"By collaborating with pharmaceutical companies, we gain access to an increasing amount of information on substances or molecules during their development phase, and we are able to analyze their doping potential, determine whether they can be detected by current tests and, if not, develop detection methods before they arrive on the market."

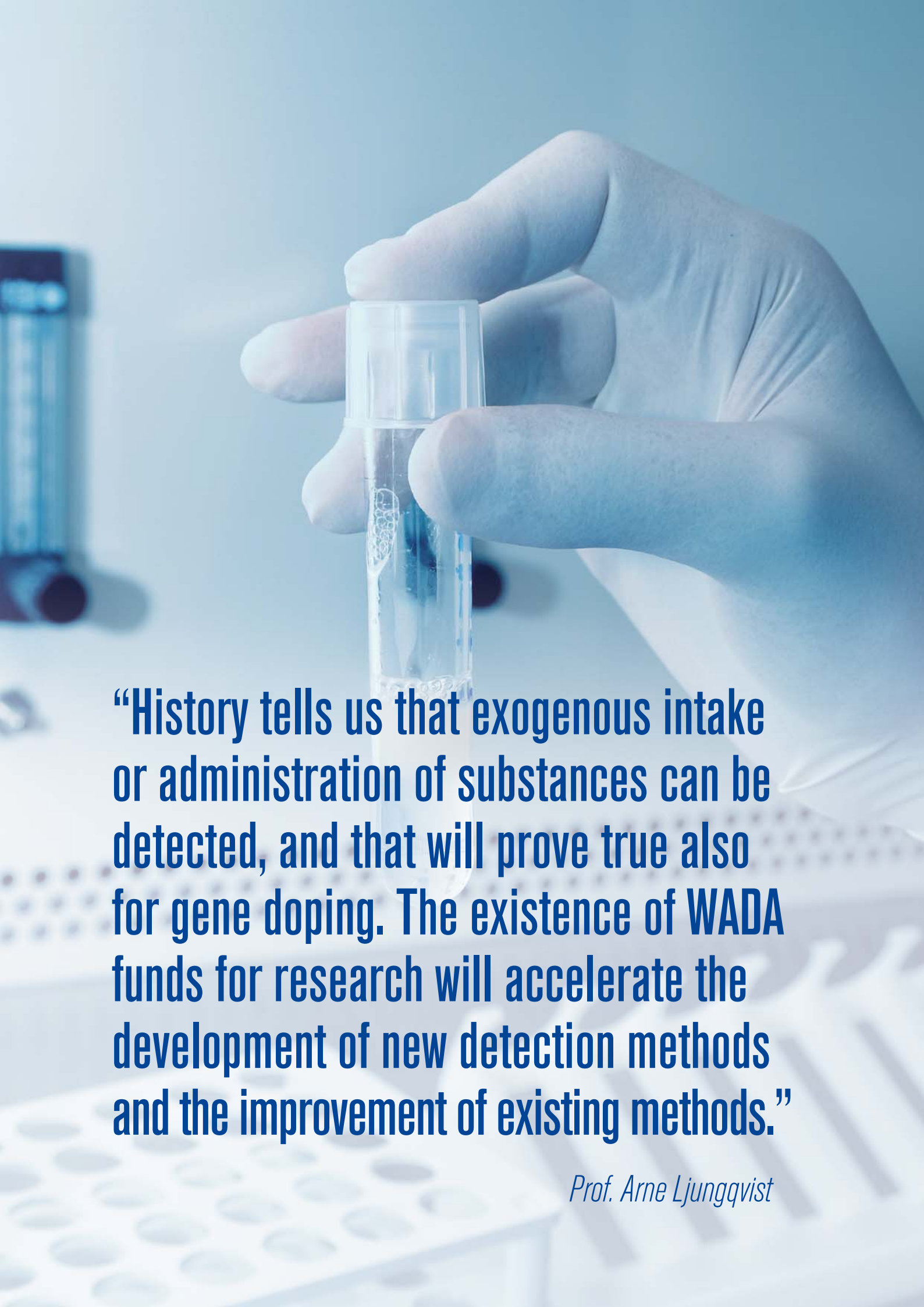
*Dr. Olivier Rabin, WADA Science Director*

doping research on a government level. In Beijing in December 2006, for example, the Chinese government organized a seminar, attended by WADA representatives, in order to present the results of various scientific research projects and advance anti-doping research in the country.

The pharmaceutical industry provides another important focus for WADA and research collaboration. "Several pharmaceutical companies share our concerns and do not want their

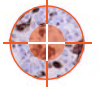
drugs, developed for therapeutic purposes, to be abused for doping purposes," explained Dr. Olivier Rabin, WADA's science director. "By collaborating with these companies, we gain access to an increasing amount of information on substances or molecules during their development phase, and we are able to analyze their doping potential, determine whether they can be detected by current tests and, if not, develop detection methods before they arrive on the market."

Similarly, WADA is exploring closer collaboration with drug agencies on an international level in order to encourage the pharmaceutical industry to take the anti-doping aspect further into account in its work and enable anti-doping agencies to be able to identify substances with doping potential far earlier and more systematically. In this regard, numerous meetings have taken place, with follow-up scheduled in the coming months.

A hand in a white lab coat holds a clear test tube containing a blue liquid. The background is a blurred laboratory setting with various pieces of equipment. The text is overlaid on the lower half of the image.

**“History tells us that exogenous intake or administration of substances can be detected, and that will prove true also for gene doping. The existence of WADA funds for research will accelerate the development of new detection methods and the improvement of existing methods.”**

*Prof. Arne Ljungqvist*



### What concerns you most about the current state of anti-doping scientific research?

The fact that the resources for research into anti-doping are still quite limited and that scientists will not find research into anti-doping as a priority field.

Scientists conduct their specific research because of personal interest in, and passion for, a particular problem. But they also take availability of funding into account. You hardly go into a research field for which there is no possibility of funding. In short: we have to compete with other areas of research for the good scientists by showing the importance of our field of research and by showing the scientists that we have money available for them. It is probably more prestigious to conduct research into cancer, AIDS, or malaria than to do research in anti-doping, though anti-doping research is also a noble cause offering significant benefits to public health. It is a tough competition, and it is for us to build up the prestige of research in anti-doping, and it is for the Olympic Movement and for the public authorities to understand the importance of proper funding. With WADA having been in place for seven years with an unchanged budget—which could not be fulfilled during the first few years—I now think it is time to increase the WADA budget substantially. And I take for granted that 20–25 percent of an increased budget will still go to research. I honestly believe that it is an inevitable evolution if the fight against doping shall continue to develop.

### Where is the future of anti-doping research?

An obvious, and probably not too distant challenge will be gene doping, and to find ways to detect it (*see related article, page 12*).

We have already been successful in recruiting the necessary international expertise to assist us. But I believe that we will have to pass through both failures and disappointments before we have a method, or different methods, in place. And that may prove a costly path to pursue. I hope that our stakeholders will understand and accept that. Scientific research cannot be expected to always give immediate and clear cut answers to all questions.

One further area of research relates to the high costs of doping controls and analysis. The development of inexpensive and large scale screening methods would greatly enhance the efficiency of the anti-doping work by allowing for a significant increase in the overall number of doping controls.

But the future of anti-doping research will obviously not be limited to research into methods for the detection of doping. We need to know more about long-term effects and side effects of various types of existing and future doping regimes, as we need to know more about what drives athletes to abuse doping substances. It may sound a little pessimistic, but I am afraid that there will always be athletes who are ready to dope. We have to conduct research in order to better understand how to prevent people from resorting to doping and what strategies should be used from time to time in order to detect those who actually dope. WADA has today a very small research budget for studies based on sociological and behavioral science (*see related article, page 30*).

Let me finish with an optimistic conclusion. I have been involved long enough to have experienced all those events that have taken place when new doping substances have come into use. The comments, even from well known scientists, have often been: "You will never be able to detect that." Such were the comments when we first started to develop methods for the detection of anabolic steroids back in the 1970s. Such were the comments when attempts were being made to detect testosterone. Such were the comments when EPO came on the market in the early 1990s. And such were the comments when attempts were being made to detect growth hormone. Today we have methods available for each of these substances. Of course, they can be improved so that drug takers do not produce false negative samples. And, of course, the methods would have been developed much quicker had proper research funds been available. But history tells us that exogenous intake or administration of substances can be detected, and that will prove true also for gene doping. The existence of WADA funds for research will accelerate the development of new detection methods and the improvement of existing methods. ■



# WADA Scientific Research Program: In Depth

WADA holds multiple science and medicine responsibilities in the fight against doping in sport, including annually preparing and publishing the **List of Prohibited Substances and Methods**, overseeing stakeholder implementation of **Therapeutic Use Exemptions**, and **accrediting and re-accrediting anti-doping laboratories** worldwide. These duties were assumed by WADA in 2004 with the entering into force of the Code and its related International Standards.

Another key priority for WADA is the development of the field of **anti-doping scientific research** for the effective detection and deterrence of doping in sport. **WADA Science Director Dr. Olivier Rabin**, in an interview with *Play True*, explains how WADA's scientific research program is structured and some of the advances the program has achieved since its inception in 2001.

**Play True: Can you give us a little background on the history of research in anti-doping? WADA is a fairly young organization. When did scientific research become a priority for WADA and why?**

**Dr. Olivier Rabin:** Before the inception of WADA, anti-doping research was handled mainly by the IOC and the IOC-accredited anti-doping laboratories. A WADA research program was identified as a key priority by the constituents of WADA and was established as early as 2001, less than two years after the agency was created.

**What are the objectives of WADA's research program?**

Overall, the program aims to improve our ability to detect and deter doping. We have several goals in this regard. First, we want to enhance existing tests and methods so that they become more sensitive, more rapid, more selective and less costly. We also develop new tests and technologies to detect new substances and new markers as we become aware of them. We are exploring new strategies in the fight against doping, such as the longitudinal study of athlete biological parameters—what we call the “Athlete’s Passport” (see *related article*, page 19).

Our work too is devoted to the anticipation of future doping trends and practices as well as the development of a worldwide network of research teams able to coordinate and bridge scientific research efforts among the various partners.

**What have been some of the key themes of the research program in 2001–2006? How are these themes identified?**

WADA's HMR Committee, a panel made up of international scientific experts, identifies priority themes that need to be addressed through research. The current focus includes compounds and methods regulating and enhancing growth; compounds and methods enhancing oxygen carrying capacity of blood; endogenous and exogenous anabolic steroids; projects relating to the Prohibited List; gene and cellular technologies applied to sports; and genetic, physiologic and environmental factors related to doping.

What is interesting to note is the evolution of these themes since WADA first launched its scientific research program, revealing the necessary constant adjustments of anti-doping research to incorporate cutting edge scientific knowledge and address new issues facing anti-doping.

### Who typically applies for WADA scientific research funds?

Various organizations and research teams from the five continents apply for WADA grants. The majority of the research teams are academic teams not traditionally related to the anti-doping field but applying their area of expertise to anti-doping research. It is key for WADA to attract other scientific competencies to expand anti-doping horizons. Many projects are also coming from anti-doping laboratories which apply their expertise in the field to develop innovative research.

### How are research proposals solicited, and how do you determine which ones to fund?

It is quite an extensive annual process, beginning with a call for proposals in the early part of the year for submission in May. The peer review of projects by external panels of experts occurs in June and July, so that, by September, the HMR Committee can review the projects' peer review ratings and comments. The HMR Committee then presents its recommendations to WADA's Executive Committee for approval. During the balance of the year, accepted proposals undergo ethical review by external experts prior to formal acceptance and release of funds. Of course, many projects are multi-year endeavours and we actively monitor their progress throughout their entire lifecycles.

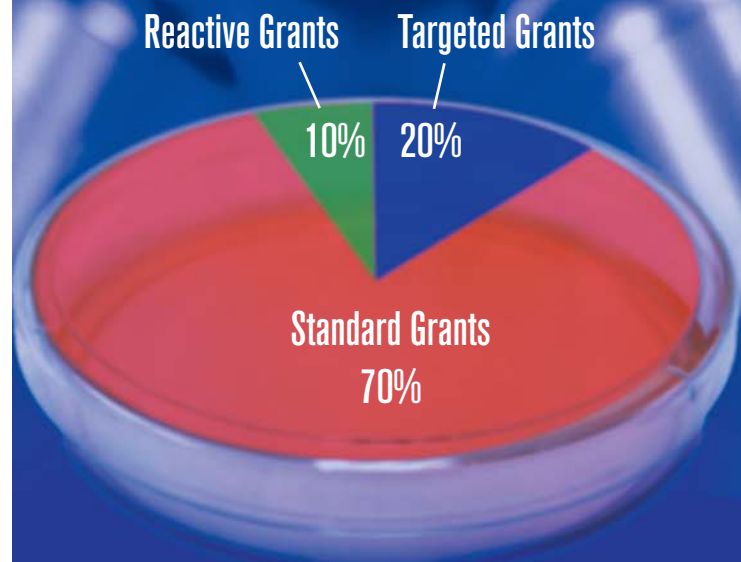
As far as determining which projects to fund, we first start with the principle that approximately 70 percent of our budget will go to quality projects in subject areas defined as priority research themes by the HMR Committee, roughly 20 percent will be devoted to topics we have targeted as needing research attention but not necessarily covered by research applications, and the rest is reserved for those situations in which we need to be reactive, such as when a new designer steroid is uncovered and we need to develop rapidly a detection method for it.

### How much has WADA devoted to research?

WADA committed US\$6.6 million to scientific research in 2007. That's in addition to the US\$25 million that has been put toward research since 2001. What's important to recognize is that for an international agency with an annual budget of approximately US\$23 million, close to 30 percent of the total budget for scientific research represents a significant

## How WADA Allocates its Research Budget

WADA's research budget is divided into three types of "responses" or programs: standard grants, targeted grants and reactive grants. While approximately 70 percent of WADA's 2007 research budget is allocated to projects based on the subject matters prioritized by the HMR Committee, approximately 20 percent is targeted to specific areas to respond to specific research questions that need answering. The remaining budget is reserved to enable WADA to react in times of need, for example when a new designer steroid is uncovered and the rapid development of a detection method is required.



### Quick Stats:

#### WADA Scientific Research Program 2001–2007

- 291** Applications received from 205 research teams
  - 50** Teams from traditional anti-doping field
  - 105** Teams from outside anti-doping (e.g. genetics)
- 117** Projects approved for funding (approximately 40% acceptance rate)
- 26** Percentage of WADA's overall budget dedicated to scientific research in 2006
- 31.6** Total US\$ in millions committed by WADA to scientific research, 2001–2007



“Science remains a component of an integrated solution in the fight against doping, and is probably more under the spotlight today—especially now that it is universally accepted that doping not only undermines the integrity of sport, but more alarmingly poses a serious threat to public health.”

investment and reflects WADA's commitment to advancing the science of detection.

### **Let's talk about results. What can you say about the outcomes of research so far? How has the research helped to advance the fight against doping in sport?**

There's quite a long list of important improvements and breakthroughs in anti-doping science, but to give you some examples, let me start with anabolic steroids. In 2005, we discovered and disclosed desoxy-Methyl-Testosterone, or DMT, the designer steroid uncovered by WADA in collaboration with the Montreal anti-doping laboratory headed by Prof. Christiane Ayotte and later related to the BALCO affair. Other key advances relating to anabolic steroids include the detection of 6 Oxo compounds; a method to detect aromatase inhibitors; the development of certified reference materials to further increase the quality of substance analyses in laboratories; proof of tainted supplements converting into nandrolone; the detection of new long lasting steroid metabolites; and confirmation of IRMS importance to detect testosterone abuse.

As for blood doping, we have been able to develop and implement a detection method for HBOCs. With the U.S. Anti-Doping Agency (USADA) as our partner, we have been working on a detection method for homologous blood transfusion. Other projects include the development of the EPO analysis software GasEpo; the study of the influence of exercise on EPO urinary profiles; exploration of new approaches for EPO detection (e.g., 2 DG, chromatography, antibodies); as well as the blood module for the Athlete's Passport.

The abuse of hGH is an area of critical concern for the fight against doping, and WADA has devoted more than US\$3 million to hGH research alone. This research has included the development and validation of the differential immunoassays; co-development of the hGH markers approach

(with the IOC and USADA); validation of markers for ethnic and sex differences; and demonstration of the non-validity of the Ghrelin marker.

Our research efforts have also brought us the development and validation of insulin detection, the detection of dextrans, identification of the masking properties of alpha reductase inhibitors, and the ergogenic effects of Beta-2 agonists.

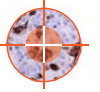
### **Where are you currently focusing your research efforts?**

We are always trying to enhance current detection methods, and in that respect we are working on extending the detection window for the EPO test and the hGH test. As for new tests, some of our priorities include autologous blood transfusion, certain hormones (e.g. IGF-1) and new steroids. Of course, new methods are being addressed, such as genomic signatures, proteomics and metabolomics, and longitudinal integration of chemical/bio-physiological parameters.

### **What is your feeling about WADA's ability to meet these challenges?**

WADA inherited a situation in which very little research was being conducted and, in a brief period of just a few years, has built a strong international research program with various key scientific challenges solved or being currently addressed. Much remains to be done, but a momentum has been created with the strong belief that with sufficient resources, anti-doping science can deliver adequate solutions to the issues anti-doping is facing and will face in the future.

Science remains a component of an integrated solution in the fight against doping, and is probably more under the spotlight today—especially now that it is universally accepted that doping not only undermines the integrity of sport, but more alarmingly poses a serious threat to public health. ■



# Gene Doping

## An Overview and Update

Gene therapy represents an exciting and promising step forward in medical research, but its misuse to enhance athletic ability poses a serious threat to the integrity of sport and the health of athletes. WADA has been tracking the threat of gene doping since it first became a notion and has devoted significant resources to enable its detection. As early as 2002, WADA hosted a conference on gene doping at the Banbury Center on Long Island (U.S.), the first time experts from both the scientific and athletic worlds came together to tackle this issue. Then, in December 2005, WADA, in collaboration with the Karolinska Institute and the Swedish Sports Confederation, held a second workshop meeting in Stockholm (Sweden) on gene doping in sport to take stock of the situation and develop worldwide consensus on the way forward.



Instrumental in leading the debate has been world-renowned expert **Prof. Theodore Friedmann**, professor of pediatrics and director of the gene therapy program at the University of California, San Diego (U.S.). Prof. Friedmann is head of WADA's panel on gene doping and shares his thoughts on the current state of gene therapy and its implications for doping and sport.

### Play True: How have recent advances in genetics impacted the world of sport?

**Prof. Theodore Friedmann:** Sport is being affected seriously by genetics in two important ways. The first positive effect is the development of new kinds of tests for any and all kinds of doping. WADA has developed an important set of research studies and results that indicate that the tools of the modern genetic revolution—the same kinds of tools that produced the deciphering of the human genome several years ago—will be applied to finding evidence of exposure to performance-enhancing materials and procedures. On the negative side, the huge advances in gene therapy and the methods of introducing genes into humans to treat life-threatening disease are being seen by some to allow new ways to dope by introducing genes—not to cure disease but rather to enhance athletic performance. Genes control the function of muscle cells, blood-producing tissues and the ways in which our bodies utilize energy, and we know that many of



those genes can be manipulated. The advances in methods to introduce new genes to cure are more or less identical to the methods that might be imagined for sport enhancement. That fact makes the likelihood of attempts at gene doping pretty high.

### **Do you believe that gene doping is happening right now?**

My only honest answer to that question is, "I don't know." What we do know is that there is a growing level of interest in the sports world in the potential for gene doping, and that some scientists working on potential genetic cures for muscle diseases like muscular dystrophy or blood disorders are being approached by sports figures to inquire about the use of genes in sport. We also know that at least one prominent sport trainer in Germany has been accused of making attempts to

gene therapy studies have also led to very serious and entirely unpredicted and unexpected harm to the patients, even death. This technology is highly experimental and completely inappropriate where the goal might be something other than the cure of life-threatening disease like cancer, neurological degenerations and so on. To apply this very immature technology to athletes or to any young, healthy people for the purpose of increasing some already-normal function, in my mind, is unethical and constitutes deliberate professional malpractice.

### **In terms of developing a detection method for gene doping, how high of a priority is this for the anti-doping community?**

During the past four to five years, WADA has developed a vigorous research program designed to

convince that WADA will be able to develop and eventually implement effective new ways to detect doping in sport by these new methods.

### **What kind of outcomes has the research provided so far?**

The scientists working under the WADA banner have learned a great deal about the function of some genes that are likely to be used illicitly in gene doping attempts, such as genes that produce growth factors (e.g. hGH, insulin-like growth factor and related muscle factors) and erythropoietin. This kind of science is complex and long-term, but the results of these studies are beginning to be published in the scientific journals and shared with the general scientific community. WADA-supported studies have shown that when these genes are

**“WADA is not a basic research funding agency but WADA is certainly the lead agency—in fact the only one that I know of—in the application of modern molecular genetics and DNA technology to the development of improved methods for detection in doping and in averting the use of gene therapy approaches to doping.”**

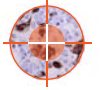
obtain an experimental material designed to increase blood production in patients with cancer and kidney disease. His case is currently being investigated and I expect that more of this situation will come to light soon.

At the same time, I am very familiar with the problems that the field of gene therapy continues to have delivering foreign genes to humans in ways that are effective and safe. Although a number of remarkable new therapies have been developed, a number of

learn how foreign genes might be used in attempts to improve athletic performance. Many laboratories around the world are taking part in the program and the general genetics community is submitting high quality proposals to WADA. I would estimate that close to eight million dollars (U.S.) have been committed and spent in the WADA research program for gene doping, representing a significant portion of the entire WADA budget. I think that the size of the effort is appropriate for the size of the threat to sport. I am

introduced into test animals, some of the expected effects, such as muscle growth and increased blood production, do in fact occur but also that many other unwanted and potentially disruptive effects occur to many other normally functioning genes and to the normal metabolic processes that they regulate. In some studies, a number of these "side effects" changes to genes and to metabolism are being put together to try to develop a "signature" for exposure to potentially doping agents.





At the December 2005 Gene Doping Workshop, experts stated, in the Stockholm Declaration,\* that "gene transfer for the purpose of therapy remains a very immature and experimental field of human medicine." Have there been any significant developments in gene therapy since then that would change the outlook for gene doping?

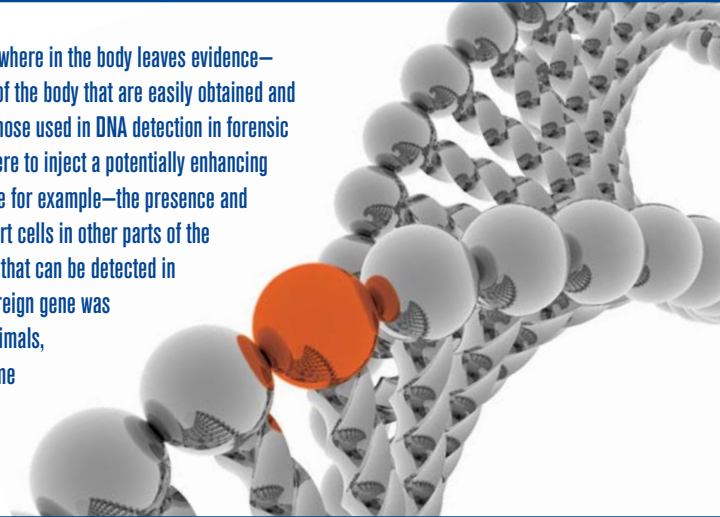
The technology of gene therapy is still very immature and while there continue to be advances in serious diseases, we have all been sobered by the magnitude of the problem of delivering genes safely into human beings and to the ways in which foreign genes can produce unwanted effects, some of which are lethal. Since the Stockholm workshop, there have been many improvements in these technologies, increasing evidence for success in some lethal diseases.

There have also been additional occurrences of setbacks and adverse events, including an additional death among the group of children who have been so successfully treated for immune deficiency by gene therapy. As we continue to improve the technology, we will sadly see more ways in which the methods can surprise us with unexpected effects and with serious harm to patients. In medicine, we recognize that treatment can be a two-edged sword: harm and benefit. To cure disease, we all accept both sides of the sword. For healthy young people, we should demand that we do no harm. Clearly, that is not the case for gene transfer technology.

**You also stated that scientific progress "suggests that new detection methods are likely to emerge, which will help to keep sport untainted by gene doping methods." Is this true?**

## Detecting Gene Doping

Exposure to a foreign gene anywhere in the body leaves evidence—a "footprint"—in other tissues of the body that are easily obtained and tested, by methods similar to those used in DNA detection in forensic science. For instance, if one were to inject a potentially enhancing agent into one tissue—a muscle for example—the presence and action of that new gene will alert cells in other parts of the body and will cause responses that can be detected in places other than where the foreign gene was injected. This occurs in test animals, and it is very likely that the same happens in humans.



Yes. It is true. I have no doubt that new detection methods will be developed. Early methods are already being designed at this very moment. In exactly the same way that DNA technology has added so much in forensic science and crime detection, DNA technology will add very powerful new tools to detect doping.

Let me close by highlighting that WADA is not a basic research funding agency but WADA is certainly the lead agency—in fact the only one that I know of—

in the application of modern molecular genetics and DNA technology to the development of improved methods for detection in doping and in averting the use of gene therapy approaches to doping. WADA has also sponsored the most important and influential public forums for a discussion of this societal problem and discussions are underway for another conference in 2008.

WADA has done the world of sport a great service in undertaking this work. ■

### BRIEF BIO

Prof. Theodore Friedmann received his undergraduate and M.D. degrees from the University of Pennsylvania and his clinical training in pediatrics at Boston Children's Hospital of Harvard University from 1960–1962 and 1964–1965. He served as a medical officer with the U.S. Air Force and carried out post-doctoral research at the University of Cambridge (U.K.), the U.S. National Institutes of Health (NIH) and the Salk Institute in California. He has been on the faculty of the University of California San Diego (UCSD) since 1971 where he is now professor of pediatrics, Muriel Whitehill Professor of Biomedical Ethics and director of the UCSD program in gene therapy. He is currently president of the American Society of Gene Therapy, and in addition to his work with WADA's Health, Medical and Research Committee (gene doping panel chair), he has served on many national and international genetics panels and committees, including chairmanship of the U.S. NIH Recombinant DNA Advisory Committee.



# The Researcher's Perspective

The development of a detection method for **hGH** has been a significant priority for the scientific community devoted to the fight against doping. The widespread implementation of the hGH detection method is expected to occur later this year.

The successful development of one of the strategies to detect hGH is the result of team work involving key contributions from Dr. Zida Wu, Dr. Martin Bidlingmaier and many students and technicians, led by **Prof. Christian Strasburger, chief of clinical endocrinology, Charité Universitätsmedizin Berlin, Campus Mitte**. Prof. Strasburger describes what it was like to take on the challenge of developing the hGH detection method (isoform approach), an often arduous yet in the end fruitful experience.

## Play True: How did you become involved in research for hGH detection?

### Prof. Christian Strasburger:

Following completion of my doctoral thesis on chemiluminescent immunoassays in 1984 and two years of clinical training, I had the opportunity to stay for a two-year post-doctoral fellowship at the Weizman Institute of Science in Rehovot (Israel), where I learned how to generate monoclonal antibodies against hGH (1986–1988). After returning to Germany, my team and I started a long

series of generating high affinity monoclonal antibodies to hGH.

An eminent problem and dilemma in clinical medicine is that different assay techniques measuring hGH yield very discrepant results, and yet, on these measurements, clinical decisions are based regarding daily injections of short children and nowadays life-long daily injection for adults with growth hormone deficiency. Therefore my colleagues and I developed and validated a method combining a monoclonal antibody and the

extracellular part of a growth hormone receptor molecule to report only those GH-forms in circulation which retained the capability of activating GH-receptors. In the validation process of this method we recognized that it had a clear preference for recombinant hGH over pituitary-derived hGH in human serum.

## So that was the start. How long has the entire process taken, what have been the major steps involved?

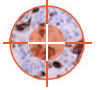
The initial observation was made in 1996 and it took more than 12

## About hGH Detection

HGH is a hormone that is synthesized and secreted by cells in the pituitary gland located at the base of the brain. HGH is known to act on many aspects of cellular metabolism and is also necessary for skeletal growth in humans. The major role of hGH in body growth is to stimulate the liver and other tissues to secrete insulin like growth factor (IGF-1). IGF-1 stimulates production of

cartilage cells, resulting in bone growth and also plays a key role in muscle and organ growth.

HGH is prohibited both in- and out-of-competition under the List of Prohibited Substances and Methods. Commonly reported side effects for hGH abuse include: diabetes in prone individuals; worsening of cardiovascular diseases; muscle,



months before we obtained initial funding from the German Federal Institute of Sports Sciences to screen the more than 100 monoclonal antibodies to hGH that had previously been generated for their ability to detect the existing structural differences between recombinant hGH as a monomorphic preparation and the mixture of hGH isoforms as secreted by the pituitary gland.

After combining two antibodies each in a sandwich immunoassay format for the measurement of recombinant hGH on one hand and pituitary-derived hGH on the other hand, we approached the consortium GH 2000, led by Prof. Peter Sonksen, and informed them about our potential solution to the problem they were addressing. The consortium collaborated in providing us 40 blinded samples derived from either pituitary stimulation tests for hGH release or from the pharmacokinetic profiles after injection of hGH in GH-deficient adult patients. Our differential immunoassay approach permitted us to differentiate these 40 serum samples without error. This blind test of the differential immunoassay

strategy based on hGH isoform differences certainly represented a significant breakthrough and we were able to publish these findings in *The Lancet* in early 1999.

It was tedious to maintain research support and after the 2000 Olympic Games in Sydney, the IOC provided a research grant for three years by which we aimed to further increase the discriminatory potency of our technique and select the most suitable monoclonal antibodies among the large panel of anti-hGH monoclonals that were previously established.

Before the 2004 Summer Olympics, WADA, jointly with USADA, hosted scientific workshops of the most active scientists involved in hGH anti-doping research worldwide and decided to move forward with the isoform approach.

The isoform approach by differential immunoassay strategy for the detection of hGH abuse was applied during the Athens Summer Olympic Games and the Turin Winter Olympic Games. Because it is not feasible that an

academic hospital provides immunoassay reagents of the highest quality control standard for a long period of time to all WADA-accredited laboratories, we started to look for collaboration with the diagnostic industry. Unfortunately, our first selected partner, after more than two years of collaboration, decided to discontinue the joint development project for the differential immunoassay kit. We therefore had to identify a new partner in the diagnostic industry and found a highly reputed collaborator in Germany. At the end of 2006, the CMZ-assay company was founded which will be marketing these differential immunoassay kits later in 2007.

**What is the status now of the detection method for hGH?**

By changing the performance platform of the differential immunoassays from microtiterplate-based fluorescence immunoassays to tube-based chemiluminescent immunoassays and by improving the antibody immobilization technique, the lower detection limit of our

joint and bone pain; hypertension and cardiac deficiency; abnormal growth of organs; accelerated osteoarthritis. In untreated acromegalic individuals (known for pathological over-production of hGH), many of the symptoms described above are observed and life expectancy is known to be significantly reduced.

The test to detect hGH abuse is a blood test and is reliable. It was introduced at the Athens Olympic Games in 2004 and other major sport events. However, because

hGH is often taken by doping athletes in the off-season to optimize performance, the test is most effective when implemented in a no-advance-notice out-of-competition strategy. Widespread implementation of the test, once produced on a commercial basis, will allow routine testing.

Another test, in its final research stage, will be combined with the current test to further enhance the detection window for hGH abuse. The concepts and development of both hGH tests

have been systematically reviewed by international independent experts in such fields as hGH, endocrinology, immunoassay, analytical chemistry, etc. These tests are the outcome of nearly US\$10 million in research over the course of more than 11 years, first initiated by the IOC and the European Union, and then taken over by WADA when it was created and had adopted scientific research as one of its priority activities.



“Our method's underlying principle is that these structural differences between recombinant hGH and hGH in human sera exist regardless of age, gender, ethnic background or sports discipline. With the improved lower detection limit as achieved during the presently completed commercialization, the usefulness of the method is further significantly improved.”

method could be dramatically improved. The method is robust and stable and is expected to pass industrial validation and certification tests in the forthcoming months to then become generally available.

#### **Why is the detection of hGH so important?**

hGH has apparently been used widespread because it was considered undetectable and the known physiological effects of growth hormone are muscle building as well as lipolytic and therefore providing energy substrates which cheating athletes obviously fancy. Growth hormone has been discovered in the luggage of an elite athlete and several athletes have meanwhile confessed having abused hGH to enhance their performance. If clean athletes are to compete on a level playing field, then hGH detection must be implemented.

#### **How confident are you in the detection method's reliability and validity?**

We are extremely confident in this method because it is a very direct approach. If an athlete abuses hGH, then by the direct measurement of hGH, doping

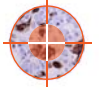
analysts have the best opportunity to prove the abuse. Our method's underlying principle is that these structural differences between recombinant hGH and hGH in human sera exist regardless of age, gender, ethnic background or sports discipline. With the improved lower detection limit as achieved during the presently completed commercialization, the usefulness of the method is further significantly improved.

#### **What have been the most significant challenges you have encountered along the way?**

After the idea was there, the major challenge was to obtain and maintain research funding for this activity at a university teaching hospital. We also had to learn that the transfer from an academic setting to commercial rollout of such a differential immunoassay involved tedious work, but also provided opportunities of methodological improvement. Finally, when we started working on this project, WADA was not yet founded and the message in support of anti-doping was not as unequivocal as it is today. Even our colleagues were sceptical about patenting such an idea due to the limited number of interested organizations at the time.

#### **What advice would you give young scientists interested in anti-doping research?**

I would advise young scientists who have begun to enjoy research in one area to take a step back and take a broader look at different approaches to the solution of the problems supposed. While traditional anti-doping laboratories are using gas chromatography / mass-spectrometry (GC-MS) methods to detect small substances like anabolic steroids, amphetamines and so on, recombinant proteins approximately 100 times larger such as EPO or growth hormone cannot be detected from serum samples by these techniques and if the GC-MS methodology is to be applied, then an immuno-recognition and affinity chromatography step has to precede the analytical step to allow removal of the bulk of other proteins in the sample otherwise interfering. Therefore, immunoassays traditionally used in the neighboring discipline of endocrinology have their place and in turn endocrinologists are learning from doping analytics and are bringing GC-MS for steroid metabolites to the clinical routine. Young scientists should broaden their horizons and experience and know that there is “more than one way to Rome.”



### What do you see for the future of anti-doping research?

I believe anti-doping research has to use a dual strategy. First, there needs to be more funding of anti-doping analytical research to narrow the gap between the also science-driven doping versus the anti-doping movement. Secondly the phenomenon of doping in my opinion requires sociological and psychological research looking at sports as a mirror image of human society and we have to strive to better understand what goes wrong in society leading to the use of performance enhancing drugs in sports. We need to convince young athletes that they should compete by fair means, even if it means not winning. ■

#### BRIEF BIO:

Prof. Christian Strasburger is chief of clinical endocrinology at Charité Universitätsmedizin Berlin, Campus Mitte. He received post-doctoral training at the medical faculties of the universities in Lübeck and Munich (Germany). He also held a post-doctoral fellowship at the Weizmann Institute of Science in Rehovot (Israel).

Prof. Strasburger has published more than 140 scientific articles and serves on the editorial board of *Pituitary, GH- and IGF-research, Journal of Endocrinological Investigation*. He was recently appointed editor-in-chief of the *European Journal of Endocrinology*. In addition, Prof. Strasburger serves on the councils of the Growth Hormone Research Society and the European Neuroendocrine Association, and served formerly on the German Endocrine Society Council.

Prior to university, he was a rower on the German junior national team and competed at the world championships.

#### GLOSSARY:

**Affinity chromatography:** Chromatographic method of separating biochemical mixtures, based on a highly specific biologic interaction such as that between antigen and antibody.

**Chemuniliscence:** Emission of light (luminescence) without emission of heat as the result of a chemical reaction.

**Chromatography:** Family of laboratory techniques for the separation of mixtures. It involves passing a mixture dissolved in a "mobile phase" through a "stationary phase," which separates the analyte to be measured from other molecules in the mixture and allows it to be isolated.

**Immunoassay:** Biochemical test that measures the concentration of a substance in a biological liquid, typically serum or urine, using the reaction of an antibody or antibodies to its antigen. The assay takes advantage of the specific binding of an antibody to its antigen.

**Isoform:** Version of a protein with only small differences to another isoform of the same protein.

**Mass spectrometry:** Analytical technique used to measure the mass-to-charge ratio of ions. It is used in anti-doping to find the composition of a physical sample by generating a mass spectrum representing the masses of sample components.

**Microtiterplate:** a flat plate with multiple "wells" used as small test tubes.

**Monoclonal antibodies:** Antibodies that are identical because they were produced by one type of immune cell and are all clones of a single parent cell.

**Pharmacokinetics:** Discipline of pharmacology dedicated to the determination of the distribution and elimination of substances administered to a living organism.



## The Frontier between Anti-Doping and Medicine: The Athlete's Passport

By Dr. Alain Garnier, WADA Medical Director

Given the various practices that have been used since ancient times to enhance human performance, doping can be regarded as having existed since the beginnings of sport. In this respect, it is likely that human behaviour has changed less than the arsenal of treatment methods available. In the past, more often than not, a substance was taken sporadically, during or in proximity to a sporting event. In this context, the toxicological approach, based on the detection of a substance or its metabolites in a urine sample, can be considered a valid solution. Unfortunately, sport has recently seen the establishment of organized, planned doping, based on a more rigorous scientific approach that makes use of all available resources. Consequently, it has become increasingly difficult to detect modern doping methods using the traditional anti-doping approach adapted to old techniques.

The limits of the system have already been reached if one considers the new protocols for the doping abuse of EPO (microdoses, intravenous solutions, etc.), autologous blood manipulation, recourse to growth factors or even cellular therapy. The arrival of biotechnologies and products as a result of pharmacogenetics will no doubt further heighten this trend. In order to ensure that the mechanism does not operate in favour of cheats, as opposed to in favour of the organizations leading the fight against doping, the methods to combat this scourge

must be adapted and anticipate future trends. The fight against doping has to be equipped with the same means, both scientific and financial, as those used by cheats if it is to avoid becoming inefficient. In view of the contribution of biotechnologies and new doping protocols, endeavouring to detect a substance in the body at a given moment is no longer sufficient. Some coaches are effectively capable of ensuring that the athletes concerned are “free” of all traces of substance during presumed testing periods, despite the implementation of unannounced testing programs to tackle this stumbling block. Moreover, the ergogenic effects obtained by an athlete during treatment can, in some cases, last weeks, months or even years, as recently demonstrated in relation to anabolic steroids.

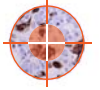
Consequently, it appears that the nature itself of the available substances, combined with the sophistication of the protocols used, can rapidly illustrate the limits of the direct detection of banned substances, particularly if only the urine method is used. The majority of doping substances are drugs used for purposes other than their medical intent; these have numerous physiological, biological and metabolic effects on the body. It would therefore be interesting to try to objectivize these different effects through a more

holistic, medical approach. The study of indirect metabolic effects on the body subsequent to the intake of a xenobiotic is known as metabionomics. It is already producing encouraging results in veterinary medicine, for example, to monitor the absence of use of hormones in breeding.

Furthermore, the use of indirect markers is common in medical practice. Thus, an elevated transaminase (hepatic enzyme) level in a patient indicates alcohol absorption, regardless of the blood alcohol level at the time of the dose. Generally speaking, in practising medicine, a diagnosis is rarely based on a single biological examination; on the contrary, it is based on a set of combined clinical and biological elements that make up the body of arguments to justify the treatment perspective.

The application of these general principles to monitoring doping through a biological passport could be used as a tool in addition to the urine and blood tests. The identification of relevant biological





parameters should make it possible to establish individual distinguishing profiles. This biological tracing throughout an athlete's entire sporting career should make any illegal preparation far harder to implement, thanks to the detection, in the event of such preparation, of indirect signs of the use of banned substances or methods. As with speed detection on roads, it is a matter of progressing from fixed radars (the location of which is often known) to mobile radars that measure speed on a permanent basis.

The Athlete's Passport, contemplated by WADA as far back as 2002, is based on a similar approach. In its final form, it would be used to meet the two-fold objective of improving the effectiveness of the fight against cheats and protecting the health of athletes. At the same time, it should also enable the intelligent targeting of athletes and promote doping controls during apparently suspicious or critical periods. From a more medical point of view, this biological monitoring is also likely to illustrate biological disturbances linked to pathological processes, whether or not these are the result of doping manipulation. If necessary, early and effective medical intervention can thus take place. In terms of public health, such an approach is very probably more effective than that consisting of advocating medically assisted doping. Above and beyond the advantages described, such a model could also constitute a good global indicator of the prevalence of doping, information lacking today in order to optimize the fight against doping.

In terms of interpretation of results, the registration of data is also of considerable interest. Indeed, biology and medicine are well aware of the limits of interpretation when references for normality are based on population averages. The registration of all individual data means that it is no longer necessary to consider an average value as the norm; on the contrary, it makes it possible to refer to the individual's own values and assess variations in these. In a model using individual systems of references, the study of the profile and the intra-individual variability becomes more relevant, bearing in mind that the validity and sensitivity will increase with the amount of data collected.

Although the concept is simple, in that different models have already been validated for widespread use in other fields, such as epidemiology, legal medicine or even veterinary monitoring, its practical application in the field of anti-doping poses a number of problems. In order to respond to the complexity of this situation, WADA has developed a multi-level strategy:

- A meeting of scientific experts to identify the most relevant parameters to be monitored (the fields of haematology and endocrinology are currently involved), as well as the data processing model to be employed.
- A legal study in order to assess the legal validity of the model proposed and the nature of possible disciplinary decisions.
- A feasibility study and implementation of strategies that

take into account the features and specificities of different sports (the monitoring parameters could vary from one discipline to another). In this context, a pilot project (the Athletes for Transparency program) under way, developed in France and backed by WADA, should assess the athletes' support for this concept considering the volunteer-based approach. It also constitutes a technical feasibility study in terms of sample collection procedures (standardization of collection and laboratory analysis protocols) and the implementation of an online centralized results platform.

- A pilot study to test and validate the most appropriate mathematical processing model is currently being developed with the IAAF and the Lausanne anti-doping laboratory.

In conclusion, if the urine and blood tests, which are essentially toxicology tests, are to be maintained and improved through increasingly sophisticated analytical methods, these will inevitably have to be rapidly combined with effective tools such as biological monitoring. In view of the challenges posed by current and future biotechnological methods, an increasingly global and biological approach, similar to that used in forensic science, is necessary in order to respond with the expected efficiency. Nevertheless, the descent of medicine and its rules on the field of anti-doping should be accompanied by in-depth bioethical reflection if the experience is to be effective and durable. ■

The Athletes for Transparency program (left), developed in France and backed by WADA, constitutes a technical feasibility study in terms of sample collection procedures (standardization of collection and laboratory analysis protocols) and the implementation of an online centralized results platform for the type of 'biological passport' now being considered. [www.athletesfortransparency.com](http://www.athletesfortransparency.com)



Sports medicine physicians, clinicians and scientists:

## Your duty and responsibility to oppose doping

By Walter R. Frontera, MD, PhD, President, International Federation of Sports Medicine (FIMS)

As the international organization promoting and representing sports medicine around the world, FIMS is interested in and committed to developing relations and establishing collaborations with organizations that share a common vision, mission, objectives, and activities. WADA is one of those important groups.

The basic principle that the practice of sport and the tradition of physical activity and exercise

In FIMS we believe in these principles and have acted accordingly since the foundation of our Federation in 1928. Moreover, the Continental Associations of FIMS in Africa (African Union of Sports Medicine), the Americas (Pan American Confederation of Sports Medicine), Asia (Asian Federation of Sports Medicine), and Europe (European Federation of Sports Medicine Associations), in addition to the countries in the region of Oceania strongly support

objective is fulfilled by means of congresses, team physician development courses, advanced team physician courses, publications (including an electronic journal), a Web site, and the preparation and dissemination of position statements on various topics of scientific interest and importance. Given the crucial role of education in the development of a human being and the formation of professionals in all disciplines and areas of knowledge, these

**"All sports medicine physicians, clinicians, and scientists have the duty and responsibility to oppose the use of doping practices in sports based on moral, ethical, and physiological grounds."**

must promote physical and mental health should be protected and respected. Further, the concept that excellent health is not only desirable but necessary for optimal performance in competitive sports must be understood and accepted. Therefore, all sports medicine physicians, clinicians, and scientists have the duty and responsibility to oppose the use of doping practices in sports based on moral, ethical, and physiological grounds.

this position. Evidence to this is the active involvement and participation in anti-doping activities of many of the leaders and members of FIMS.

One of the main objectives of FIMS is to educate sports medicine physicians around the world. We strongly believe that this will have as a consequence an enhancement of the quality of medical care for athletes at all levels of competition and in all regions of the world. This

activities represent one important way FIMS has joined the movement against doping.

In FIMS we look forward to continuing our work in this area and to partner with those that share the same values. The work done by WADA and other similar bodies must be supported by professional organizations to be more effective. This is exactly what FIMS intends to do and we hope to join WADA in this worthy endeavor. ■

### BRIEF BIO:

Walter R. Frontera, MD, PhD, is dean of the faculty of medicine and professor of physical medicine and rehabilitation (PM&R) and physiology at the University of Puerto Rico. Dr. Frontera completed his medical studies and a residency in PM&R at the University of Puerto Rico and a doctoral degree in exercise physiology at Boston University.

Dr. Frontera's career is rich with positions and achievements dedicated to the health of athletes: establishment of the Center for Sports Health and Exercise Sciences at the Albergue Olímpico, the training center of the Puerto Rico Olympic Committee (PROC); PROC chief medical officer in Central American and Caribbean (CAC), Pan American, and Summer Olympic Games; director of medical services, CAC Games; president, Puerto Rico Sports Medicine Federation; member, PROC; and Earle P. and Ida S. Charlton Professor and chairman of the department of PM&R, Harvard Medical School and Spaulding Rehabilitation Hospital.

As president of FIMS and the Pan American Confederation of Sports Medicine, his main research and clinical interests include sport injury rehabilitation and the effects of aging and exercise on skeletal muscle. Dr. Frontera has published more than 200 scientific publications and currently serves as editor-in-chief, *The American Journal of PM&R*; board member, International Society for PM&R; and fellow, Association of Academic Physiologists, American Academy of PM&R, and American College of Sports Medicine.





# Interactive Anti-Doping Exhibit made permanent at Olympic Museum



by Francis Gabet, Director of the Olympic Museum



In May 2007, the Olympic Museum in Lausanne added to its permanent exhibitions a new space devoted to the fight against doping in sport. This project came to light as a result of the close cooperation between the Olympic Museum, Dr. Patrick Schamasch, director of the IOC Medical and Scientific Department, Dr. Martial Saugy, technical director of the Swiss Laboratory for Doping Analysis, and WADA.

It was extremely important for the Olympic Museum to renew this space, not only because doping is significant in relation to the future of sport, but also, quite simply, because visitors to the Olympic Museum cite doping among the top three key issues that they would like to see dealt with when they visit the museum.

In order to make the subject appealing, the Olympic Museum sought to offer the public a recreational and interactive space. The pivoting showcases and

cubes, boxes containing information sheets, videos and touch screens for a final quiz will undoubtedly make this space dynamic and attract visitors.

This exhibition aims to give the public an overview of the past, present and future of the fight against doping. While doping in sport is not a new phenomenon, it is now important to know the various forces involved in the fight against doping. At the Olympic Games, attention is drawn to the IOC's "zero tolerance" policy and, on an international level, the various fields of WADA's activities are presented, with an emphasis on scientific and medical research, which is one of the essential weapons in the fight against doping.

The fight against doping also entails prevention and education. And, although the issue of doping often refers to the sporting context, doping conduct can be understood only in relation to society as a whole. Topics such as the cult of performance and the professionalization and increasing media coverage of sport are presented to those visitors who wish to find out about the phenomenon of doping.

While doping threatens the educational values of sport and

contravenes the spirit of sport, it represents a genuine danger to the health of athletes. The List of Prohibited Substances and Methods is exhibited in an original form: ten small cube-showcases illustrate the Prohibited List categories with a presentation of the banned substances and an explanation about their medical use, established doping effects and, in particular, side effects.

In order to safeguard doping-free sport, doping controls are crucial. The control procedure is illustrated in 12 stages through photos, from the selection of athletes right through to result management.

Raising athlete awareness is also a cornerstone in the fight for clean sport, and a video with testimonials from well-known athletes presents an optimistic vision of doping-free sport to the public. At the end of the exhibition, visitors can test their knowledge by means of a quiz, originally devised by WADA and readapted according to the topics dealt with by the Olympic Museum.

The exhibition will also be used by the Education and Culture Department during guided tours and school visits. Anti-doping kits, anecdotes and a Whizzanator will support the presentation. ■

# UK Sport Embraces



By Russell Langley, Communications Manager, UK Sport

UK Sport has been up and running on ADAMS since November 2006, and with it rolling out the latest release in the coming weeks we caught up with the members of the team at the National Anti-Doping Organization (NADO) for the UK to see what impact the system has already had, and what it hopes to achieve in the future.

WADA has been developing ADAMS (Anti-Doping Administration and Management System) since 2004, with UK Sport now having spent over a year significantly assisting with ideas for functionality, testing and refinements to help ensure that each release fully meets the needs of all concerned. The relationship first came about when UK Sport made a strategic decision in late 2005 to fully engage with ADAMS and commit resources to its implementation.

The need for dedicated resource was paramount and led to UK Sport contracting consultant Dave Beaumont who has worked closely with members of the Drug-Free Sport team to ensure a smooth transition to the system.

“We held a number of testing days over the past few months, following a mission through the entire process of planning, allocation and sample collection to ensure there are no unforeseen circumstances,” said Beaumont. “These flagged up differences in the way we work to the way ADAMS allowed. Working closely with WADA we have been able to iron these out in order to minimize the impact on our working practices.”

UK Sport’s first foray into ADAMS was through the Therapeutic Use Exemption (TUE) management element which has been in place since November 2006.

Michael Stow, science & information coordinator at UK Sport, said: “We could see straight away how ADAMS allows for better tracking of TUEs, which means we can now effectively monitor the types of medication athletes are asking for approval to use. This obviously helps from a TUE point of view, but can also provide a useful source of intelligence which can help with the planning and allocation of tests.”

In April 2007, UK Sport began managing its testing and results functions through ADAMS, with all aspects from test allocation to the notification of results now centrally managed. The first batch of missions were set up during January and February, and from the start of April all tests are now managed through ADAMS. The Testing Team at UK Sport allocates the missions and the Doping Control Officers (DCO) then log in to see where they need



ADAMS at work at UK Sport.



ADAMS Results Team who manage findings.



ADAMS Testing Team who plan and allocate all tests.

**ADAMS "not only ensures testing across the world is a little smarter, and therefore more effective, but importantly it also gives more confidence to athletes about the quality of the testing program and the faith they have in our ability to catch anyone using a prohibited substance."**



to be and when in order to carry out the test.

With the UK Sport team getting to grips with ADAMS, the next phase of preparation involved the induction of the DCOs, as Julia Hardy, quality & administration assistant at UK Sport explains:

"Being out in the field, it was vital that the DCOs understood ADAMS, particularly the areas which slightly changed the way we work. With that in mind we produced a tailor-made user guide for them covering both ADAMS and UK Sport processes. To back this up they also have a hotline they can call at any time to talk them through any issues they have. However, the user-friendliness of the system means this has hardly been used."

Once the results are back from the laboratory, they are inputted into ADAMS from where each stage of the results management process can be monitored to ensure Code compliance.

The final stage of the roll-out—athlete whereabouts—is

imminent and with the high profile cases in the UK over the past 12 months, arguably the most significant for UK Sport.

UK Sport has operated its own online whereabouts system since July 2005, and the priority will be to induct the athletes currently using this on to ADAMS before rolling it out across all other sports. A schedule for this process is currently being drawn up, with the emphasis on quality induction, backed up by thorough education and support for athletes.

Overseeing the implementation is Andy Parkinson, head of operations at UK Sport. He said: "It has taken a tremendous amount of work to get us to this stage but the fruits of that labor are already starting to show and we are delighted with how well the roll-out of ADAMS in the UK has gone.

"The real benefit of ADAMS will come when more NADOs and International Federations come on board, as the volume of information it will contain will be invaluable. For the first time we will have a global test history of athletes, allowing us to

see who was tested where and when, and what the outcome was of those tests.

"Importantly, we will also be able to see what tests are planned by different organizations meaning an end to scenarios whereby there might be duplication of tests on athletes by different bodies. This not only ensures testing across the world is a little smarter, and therefore more effective, but importantly it also gives more confidence to athletes about the quality of the testing program and the faith they have in our ability to catch anyone using a prohibited substance or method.

"Looking ahead, we're keen to remain integrally involved in the ongoing development of ADAMS. Having worked on it for so long we feel a great sense of ownership and want to do everything we can to explain the benefits to our counterparts across the world. We have recently held discussions about the mid term future of ADAMS and have plenty of ideas on how ADAMS can be further developed and we look forward to sharing our thoughts with WADA." ■



BBC Radio's Tennis Correspondent Jonathan Overend talks to the International Tennis Federation's (ITF) **Dr. Stuart Miller** about the Tennis Anti-Doping Program, which is now exclusively managed by the ITF.



**Stuart Miller** came to the ITF from the UK's Leeds Metropolitan University, where he was course leader of the Sport and Exercise Science BSc degree. Stuart has a BSc in sports science, an MSc in biomechanics, and a PhD in neuromuscular biomechanics.

In 1997, Miller became the secretary general of the International Society of Biomechanics in Sports, the world's leading sports biomechanics society. He was elected as a vice president of the organization in 2001. His expertise is in the field of sports science, and he regularly contributes scientific papers to national and international publications.

As well as Anti-Doping, Stuart's other responsibilities at the ITF include Technical (equipment) and Sports Science & Medicine.

When the ITF took control of the WTA drug testing program on 1 January 2007, a year after reaching a similar agreement with the ATP, a significant shift in the policing of the sport was complete. The Tennis Anti-Doping Program became exclusively managed by the ITF, ending the sometimes confusing and potentially conflicting days of player organizations policing and prosecuting their own members. It's just the start, and fresh challenges lie ahead in the next few months. With important revisions being proposed by the anti-doping community to the World Anti-Doping Code for as early as 2008, there could be crucial implications for professional tennis players who fail anti-doping tests. Jonathan Overend spoke to Dr. Stuart Miller, head of the ITF's Science and Technical Department that oversees the program.

**Jonathan Overend:**  
**Can you explain how drug-testing procedures in tennis have changed, if at all, since the ITF took over the ATP and WTA programs?**

**Dr. Stuart Miller:** From an administrative perspective it's now more streamlined. We don't have three separate organizations working with a single test provider. A key aim at the start was for the players not to notice a difference. We didn't want players saying, "The way I'm being

treated has changed," or, "the people who are conducting the tests are doing things differently." We're still operating on the same principles that testing is largely random, with no advance notice. All the principles for an effective testing program are in place.

**Who does the testing?**

The ITF contracts IDTM [International Doping Tests and Management] who are one of the biggest independent testing organizations in the world. They work a lot with WADA in other sports; they have a large network of doping control officers and chaperones throughout the world; and they facilitate the testing requirements that we put in place.

**What about back at base—has it meant an increased workload for the ITF?**

There's no doubt that we're busier than before. There's more testing to organize, we're working closely with both the ATP and WTA, and there are more issues to deal with (either on-site or results

management) but we have made the program, as a whole, more efficient by centralizing it.

**Ethically, for the good of the sport, was it necessary that both ATP and WTA programs came under the control of the ITF?**

I'm not going to comment on the rights and wrongs of player organizations trying to police themselves, but the potential for conflict of interest is clear. While there's no suggestion that this influenced the ATP's or WTA's operation of its programs, to be seen to have no conflict of interest is extremely important and from the ITF's point of view, having a program which is free of suspicion, which is transparent and cohesive, is very important. I think it's been a good thing and the fact that we've reached agreement with the ATP and WTA shows they think it is as well.

**How many times a year are the top players tested?**

Last year there were close to 2,000 tests in tennis, which puts

“Because testing is random, the more events you play the more likely you are to be tested; likewise, the better you do in those tournaments the more likely it is. Top players would expect to be tested more than ten times per year.”

us in the upper range of Olympic sports in terms of tests conducted. The frequency of testing depends on the players’ rankings. Because testing is random, the more events you play the more likely you are to be tested; likewise, the better you do in those tournaments the more likely it is. Top players would expect to be tested more than ten times per year.

**Since the ITF has had control of the whole tennis anti-doping program, how many positives have there been?**

In 2006 there were three doping offences—one in Australian Open qualifying, one in a challenger event and one in a wheelchair event. So, relatively few considering there were nearly 2,000 tests.

**So do you believe it’s a clean sport?**

You would have to draw that conclusion. It would be naive to think we catch every person who is engaged in doping; however, based on the principles that we’re operating within the program, the record in 2006 is certainly indicative of a clean sport. And you need a comprehensive test

program to demonstrate whether you have a clean sport or not.

**In the sport of track and field, athletes have been found guilty of taking a designer drug that nobody had known about: THG. Is that why you feel it would be naive to think you’re catching all the cheats? The fear there might be an ‘undiscovered’ drug?**

Elite sport is lucrative for players and there have been instances in other sports where the temptation to reach the top by unfair means has been too great. However, we have no evidence that it’s the case in tennis. Tennis is a difficult sport to categorize in terms of its physiological demands and therefore the type of substances that players could see as key to giving them success. Tennis has a number of contributors to success. It has endurance, speed, agility but it also has skill. You can’t be a great player without a significant amount of skill, and that in itself helps tennis be a little more confident that there isn’t widespread abuse of designer substances that we don’t yet know about.

**A few years ago the ITF was very vocal in advising players against**

**the use of nutritional supplements. What is the very latest advice?**

The ITF Sports Science and Medicine Commission has very recently updated the statement which is distributed through our Web site and through our testers to players. It does say that players are recommended not to take any dietary supplements because it’s impossible to guarantee their safety. As long as the World Anti-Doping Code maintains a policy of strict liability, the players are held accountable whatever the circumstances, so they take supplements at their own risk.

**Finally, what is the ITF doing to educate players about the risks and dangers of doping?**

It’s not just players, but also coaches we want to educate and we’re expanding our work in this field. We’ve produced a Q&A leaflet on Therapeutic Use Exemptions, we have a 24-hour hotline which is open to all players who have questions about medications or the Prohibited List, and we also work at junior level with presentations and Web site information so we can get to the players at a time when they are receptive. ☑

## Tennis anti-doping timeline

[www.itftennis.com/antidoping](http://www.itftennis.com/antidoping)

**Late 1980s:** Drug testing in tennis begins with the Men’s Tennis Council.

**1990:** With the formation of the ATP Tour, testing is extended to include performance-enhancing, as well as recreational, drugs.

**1993:** ITF, ATP and WTA create a joint anti-doping program that covers the whole of the sport.

**1999:** WADA is founded as an international independent organization to promote, coordinate, and monitor the fight against doping in all sport.

**2002:** ITF President Francesco Ricci Bitti is elected to the WADA Foundation Board. Consisting of 38 representatives from the Olympic Movement and governments, this is WADA’s supreme decision-making body.

**2006:** ITF takes over the management, administration and enforcement of the program at ATP-sanctioned events.

**2007:** ITF takes over the same duties at WTA-sanctioned events.

# Sport as Equalizer

Paralympics and World Championships multiple gold medalist Tanja Kari was once known simply as “the skier.”

She continues that tradition of single-minded dedication today, giving her all to keeping sport clean and fair for future generations.



Finnish cross-country skier Tanja Kari was born to be a champion on skis. Placed on her first set of skis at the age of four, Tanja raced in her first competition when she was six. Despite being born with a disability that took away her capacity to use two poles—two poles offer balance and speed, important factors for any skier—Tanja excelled so much while using only one pole, that she competed with able-bodied kids and garnered immense respect along the way.

“In the beginning, I was able to be equal with other kids who didn’t have a disability. Kids can sometimes be pretty cruel to each other, but they also respect other kids who are good at sport. So I think skiing gave me a way to grow up equal without thinking about my disability,” said Tanya.

She quickly became known as ‘the skier’ in her community and her skills as an athlete became more known than her disability. Today Tanja is one of the greatest female winter Paralympic athletes in history with an impressive list of achievements:

- Four-time Paralympian:
  - 2002 (*Salt Lake City*) three gold
  - 1998 (*Nagano*) three gold
  - 1994 (*Lillehammer*) two gold, one silver
  - 1992 (*Alberville*) two gold
- Ten-time World Championships medalist (nine gold, one silver)

Tanja retired at 30, following the 2002 Paralympic Games, fulfilled by her career and achievements as an athlete.

“I think we need to encourage athletes and make them think, “What is the core of sport?” There has to be joy and satisfaction, and there must be a healthy relationship. This has to start with young kids. We need to create safe and enjoyable atmospheres so kids get pleasure from sport.”

But Tanja has never really retired and continues to give back to sport. Today, she is living and working in Salt Lake City (U.S.) and is a member of WADA’s Athlete Committee and the International Paralympic Committee’s Anti-Doping Commission.

Tanja recently shared with *Play True* her views on the importance of sport in the development of young people, as well as efforts to combat doping in sport.

### Play True: What has sport given you?

**Tanja Kari:** Sport has given everything to me. It’s the basic building block of who I am. It helped me observe society via sport and sport via society. It also gave me a great education.

### What’s your opinion of anti-doping right now? What is the best way to convince young people not to dope?

I think we need to encourage athletes and make them think, “What is the core of sport?” There has to be joy and satisfaction, and there must be a healthy relationship. This has to start with young kids. We need to create safe and enjoyable atmospheres so kids get pleasure from sport.

### What is important to you when we talk about anti-doping as an issue?

I believe in the relationship with sport and its health aspect. Yes, sometimes athletes have to risk their body and push themselves to the limit. And I believe that the whole group, the whole support group needs to be on the same line with that.

### What do you think of competitive pressure in the context of performance enhancing drugs?

Most will think they can achieve without using drugs, but others may become fascinated with the idea of taking a shortcut. It’s really a question of moral ethics and the athlete is the one that has to choose his or her path. They need to ask themselves, What is really important and what is not? What is a true victory in sport? Is it the one in which you can really feel joy and

enjoyment? Or is it just a gold medal without these ingredients? Understanding this helps to understand and control competitive pressure.

### As an athlete and as a hero to many young athletes, what is the most important message you want to convey?

Athletes should challenge themselves. They can be their best without drugs or doping, I know they can. They can train and give everything to sport and know they will get everything and more in return. 🏆

# Athlete Committee Lends Muscle to a Stronger Fight against Doping

The thirteen members of WADA's Athlete Committee convened in Estoril (Portugal) on April 13–14, 2007, to provide their input and recommendations on the proposed changes to the World Anti-Doping Code and related International Standards.

The group was hosted by Laurentino Dias, Portuguese Secretary of State for Youth and Sport, and Committee member Rosa Mota, Olympic and World Champion in Women's Marathon.

The Committee agreed upon the following recommendations and statements:

- **Confidentiality:** The committee stressed the responsibility of organizations and individuals involved in the doping control and results management process to maintain athlete confidentiality when dealing with athlete information. Committee members stressed that athletes need to have absolute confidence in the integrity of the anti-doping system and the protection of confidential information.
- **List of Prohibited Substances:** When asked about views on the List of Prohibited Substances and Methods, the Committee supported the current policy and system for considering substances and methods for banning. Further, members noted that cannabis should always remain on the Prohibited List because it sends a strong message to athletes and youth worldwide. Committee members stressed the responsibility of elite athletes to serve as role models to youth.
- **Tougher Sanctions for Cheats:** The committee reiterated its strong stance for toughening sanctions for first-time serious doping offences. They said that sanctions need to be tougher in order to deter cheating and take cheaters out of competition. In light of the revision of the Code currently underway, they called for increasing the sanction for a first-time serious doping offence from two to four years.
- **Incentives for Cooperation with Investigations:** Also in the context of the Code revision, the Committee discussed the concept of offering incentives (such as reducing sanctions) to doping athletes for providing information and facilitating investigations into serious organized doping schemes. While the committee agreed that such a principle might be helpful to stem the scourge of doping and to catch cheaters, they urged that, out of fairness to clean athletes, such incentives should not encourage the rapid and easy return of doping athletes to competition.
- **Financial Penalties:** Committee members reiterated their desire for financial matters to be fully discussed and considered to ensure that those who are demoted in standing by a doped athlete can recover awards.
- **Whereabouts and Missed Tests:** Committee members were asked to provide their views on proposed changes to the International Standard for Testing (IST) relating to athlete whereabouts information and missed tests. Until now, rules for whereabouts and missed tests have not been dictated by

the IST in order to allow flexibility to national anti-doping organizations and sports federations in setting these rules. Calls are now however been made by the international community to harmonize this part of the doping control process. As a result, proposals for the global policy have been received and drafted into a new version of the IST, which is expected to be approved by November 2007 following extensive stakeholder consultation. The Committee has submitted its feedback on the current draft proposal to the WADA's Standards & Harmonization Department for consideration during revision of the IST.

The Committee received presentations from all members showing major advances made globally in informing athletes of their responsibilities and reminding them of the need to play true. The Committee will be contributing to a special section on the WADA Web site targeted at athletes for the promotion of clean sport.

On 14 April, the Committee visited the accredited anti-doping laboratory based in Lisbon. The Lisbon laboratory is 1 of 34 laboratories worldwide that are accredited by WADA to perform anti-doping analysis under the Code.

Chaired by Vyacheslav Fetisov, Head of the Federal Agency for Physical Culture and Sport (Russian Federation), the WADA Athlete Committee consists of elite international athletes especially concerned about the prevalence of doping in sport. In working with WADA and providing input on anti-doping programs and initiatives, WADA Athlete Committee members represent the voice of clean athletes and work to help level the playing field for athletes worldwide. 



# WADA and Social Science Research

On 29 May 2007, WADA issued the official call for proposals for its 2008 Social Science Research Grant Program (Program). This was the fourth call for proposals since WADA first created its Social Science Research Grant Program in 2004, awarding its first grants in 2005. With education and research being among WADA's strategic objectives, the intention is that social science research will provide an evidence-based foundation for the development of education initiatives that serve the preventive aspects of WADA's fight against doping in sport as well as contributing to the existing knowledge base in the field.

To be admissible for funding under the Program, submissions must not only satisfy the Program's detailed administrative requirements, but also be related to the specific research priorities that are formulated each year by WADA's Education Committee and that the Agency sets out in the respective call. Furthermore, WADA particularly encourages collaborative research, projects with specific cultural or regional perspectives, as well as student projects.

In a first step, and provided the submissions satisfy the Program's administrative requirements, the submissions are assessed by two external peer reviewers, using weighted criteria established by WADA's Education Committee. This includes, in particular, the scientific merit of the proposed project and the degree to which the research will have substantial impact given the objectives set out in the research priorities of the Program.

In a second step, WADA's Education Committee considers

the comments of the peer reviewers and makes its funding recommendations to WADA's Executive Committee. The Executive Committee makes the final decision as to the projects that will receive funding. The final step is for the selected projects to undergo ethical review by WADA's reviewers.

Since its inception, the Program has served to fund 14 research projects, initiated by researchers in regions as varied as Africa, North America, South-East Asia, Western and Eastern Europe, and Scandinavia. A couple of the funded projects have focused on topics relating to a specific sport or to athletes with disabilities, and one project consisted of a vast international literature review of research on anti-doping education and prevention programs, the beliefs and behaviours that lead to doping and the predictive and precipitating factors. Other topics have included the studies of the knowledge of and attitudes towards doping among a variety of specific populations (including among the medical profession) or specific countries or cultures, and the development of a psychometrically sound tool for assessing athletes' attitudes towards and propensity for doping.


To date, approximately six of the research projects funded under the Program have been completed and their reports are now posted on WADA's Web site. Although the Program is still young, the projects that have already been completed have yielded conclusions that tend to corroborate the preventive direction taken by current and ongoing anti-doping education activities.



Among WADA's long-term projects are the implementation and development of a central database of social science research reports on topics related to doping in sport.

WADA's Education Committee recently recommended that the Program be opened up as much as possible to accommodate research that is specific to various regions or cultures, to help generate momentum for anti-doping work in regions where few initiatives currently exist. As a first step in facilitating this development, the call for proposal documents for the 2008 Program have been published not only in English and French, but also in Spanish.

Finally, among WADA's long-term projects are the implementation and development of a central database of social science research reports on topics related to doping in sport. While this database will of course feature the reports of the projects funded under the Program, WADA also invites all of its stakeholders to submit all relevant research project reports that have already been made public for inclusion.

For more information concerning the 2008 Program please visit our Web site. To submit a research report for future inclusion in the WADA Social Science Research Database, please e-mail [info@wada-ama.org](mailto:info@wada-ama.org). 

# Anti-Doping Goes Global with WADA Education Seminars



Learning through play: WADA's anti-doping card game introduces spirit of sport values to students in Madagascar.

In 2005, WADA piloted an Education Symposium in Montevideo, Uruguay, with the purpose of disseminating information on doping in sport, offering guidance and providing practical tools participants can use to disseminate anti-doping messages in their countries or throughout their organizations. The success of the pilot led to five multi-national Symposia being held in Europe (Moscow and Athens), Asia (Macau and Kuala Lumpur) and Africa (Cairo).

### The Traveling Seminar Concept

In order to give a larger number of stakeholders the opportunity of benefiting from anti-doping education events, increase

participation in such events by those involved in anti-doping education first hand and promote local collaboration in anti-doping education activities, the Symposium format has recently been replaced by the Traveling Seminar concept. During a Traveling Seminar, members of the WADA Education Department and a representative of the local WADA Regional Office (or of the relevant Regional Anti-Doping Organization) travel to two or three countries within one same region to run the Seminar activities.

The ultimate goal of the two day Seminar is to empower participants to develop and implement their own anti-doping education activities. The general objectives

include providing participants with basic information on anti-doping issues and on WADA's education work, introducing participants to the Model Guidelines for Core Education and Information Programs, and engaging participants in creating a local annual and long-term plan for anti-doping education. It is intended that, at the end of the Seminar, participants will have gained a level of knowledge of and comfort with anti-doping education topics and materials sufficient to train others, help build relationships among the different actors in the region to open the doors for future joint action, and promote the sharing and communication of anti-doping education materials and policies.

Given these objectives, the Seminars include few formal presentations but instead favour small group work. These workshop-style Seminars give credence to the notion that athletes do not train in isolation and focus on the importance of educating all those who work with athletes (including coaches, health care professional, teachers, and parents) on the dangers of doping. Over the course of the Seminar, participants, representing National Sport Federations, Anti-Doping Units/Organizations, Ministry of Sport, National Olympic Committees and National Paralympic Committees, work together to establish a plan for anti-doping education.

### School Activities

In parallel to the Seminar's workshop activities, the Seminars include a school component. Local education experts (representing school administrators, classroom teachers, academics, university faculty responsible for teacher training, curriculum developers and representatives from


Ministries of Education, Sport and Youth) are engaged in a Focus Group session, to discuss and evaluate possibilities for the integration, within the local school system, of the curriculum from WADA's Teacher's Tool Kit. This Tool Kit contains a series of lesson plans, currently targeting teachers of students aged 10-12 years, with suggested activities for introducing the Spirit of Sport values and anti-doping messages to young people.

Finally, a classroom activity is included among the Seminar's other activities in order to observe first hand the reaction to and suitability of anti-doping education in local classrooms. The classroom activity typically involves a discussion surrounding the reasons why people are involved in sport (values), why sport is governed by rules and how cheating (whether doping or other forms of cheating) is contrary to the Spirit of Sport values. These classroom activities usually end with students playing the WADA Anti-Doping Card Game, which places students in situations in which they are either encouraged to cheat or find

themselves playing with people who are not following the rules and may even have to sit out of the game because they have been "banned for life."

### Looking towards the Future

The Traveling Seminar concept, along with its associated school activities, was first piloted in Nicaragua and Colombia in September 2006. A second set of Seminars were held in the Indian Ocean in March 2007 (Seychelles, Mauritius and Madagascar). Several Seminars are being planned for 2007 (Africa, Caribbean, Latin America and Oceania) and for 2008 (Latin America, Asia, Africa, Caribbean, and Eastern Europe).

Finally, in keeping with WADA's focus on positive values development for prevention purposes, modifications to the Seminar programming are regularly suggested so as to best adjust the Seminar content to local contexts, needs and resources and to encourage participants to create and implement their own, customized anti-doping programs that are based on values development. 



Learning by doing: developing a plan for anti-doping education activities in Mauritius with WADA Regional Director (Africa) Rodney Swigelaar.



Seychelles Seminar participants with WDA Education Manager Jen Sclater and Education Director Julie Carter.

# Third World Conference on Doping in Sport

Madrid (Spain), 15–17 November 2007

In February 1999, the First World Conference on Doping in Sport was held in Lausanne (Switzerland) and resulted in the founding of WADA. In March 2003, a Second World Conference was held in Copenhagen (Denmark) where delegates from governments and the sport movement worldwide unanimously adopted the World Anti-Doping Code (Code) as the nucleus for the fight against doping in sport. The Code entered into force on 1 January 2004.

The years of experience since the Code's adoption have shown it to be an effective tool, and as with any living document, requires regular review. WADA has always undertaken to coordinate this work and, in mid-2006, launched a process of review on a scale similar to the consultations that led to the Code's initial adoption. The goal is to build on experience to fine-tune the Code and enhance the global fight against doping in sport. In Madrid (Spain), from 15–17 November, at the Third World Conference on Doping in Sport, delegates will discuss the proposed changes to the Code and its related standards. A revised Code will be made available to Conference delegates in October ahead of the Conference and a final Conference resolution will be submitted for adoption during the final session of the Conference.

Since its inception, WADA has made significant advances in the global campaign against doping, and will update delegates,



observers and media on several of these noteworthy activities and achievements, as well as future strategies to combat doping in sport.

**Registration to attend the Third World Conference on Doping in Sport is now open—deadline 15 August 2007.** For additional information on the conference program, participation guidelines, registration and accommodation, please visit the official conference Web site at: [www.wadamadrid2007.com](http://www.wadamadrid2007.com).

## Three New RADOs Established: Central Africa, Eastern Europe and South Asia

The fight against doping in sport continues to expand to new regions of the world with the establishment of three new Regional Anti-Doping Organizations (RADO).

The Central African RADO (Zone IV), launched in April 2007, is being hosted by Cameroon, whose government and National Olympic Committee (NOC) have agreed to provide office and staff to coordinate anti-doping development in the region.

Belarus will be hosting the new Eastern Europe RADO which was created in March 2007. The Belarus government and NOC have agreed to provide office and staff.

In South Asia, a new RADO was established in May 2007, and is being hosted by the Maldives, whose government and NOC will provide the office and staff, in addition to accommodations and meals for meetings held in the country.

Through the RADO program, WADA facilitates the creation of anti-doping organizations in regions of the world where there previously existed limited or no anti-doping activity. Since the launch of the RADO development program in late 2004, 101 countries have become newly active in the fight against doping in sport. The objective is for all countries of the world to be engaged by 2010.

## Investigations Symposium Calls for Increased Cooperation, Development of Model Protocols for Sharing Information

WADA, with the support of UK Sport, convened an international symposium of government, sport, anti-doping and law enforcement authorities on April 16–17, 2007, in London (UK), to advance discussions on how government and sport can best coordinate efforts in the targeting of wide scale doping schemes. Attendees urged increased cooperation among multiple government and law enforcement agencies and with sports organizations to attack the more sinister elements in the doping underground.

Key themes discussed during the two-day symposium included

giving law enforcement agencies the framework and tools necessary to shut down the large scale doping schemes and facilitating collaboration between law enforcement and sports authorities in their investigative work so that sport can sanction those who facilitate and profit from cheating. A working group was created at the conclusion of the talks to follow-up on strategies discussed, including the development of model protocols and guidelines for cooperation and sharing of information.

"The 'upstream' organizers of doping on a broad scale, including

traffickers and members of the athlete entourage, must be held accountable," said WADA Director General David Howman. "Well-organized and well-financed individuals and groups who prey on athletes, profiting from their cheating while risking very little themselves, must be stopped. To do so requires a more unified and cooperative action among law enforcement and anti-doping agencies to shut down source and supply."

The London symposium followed on a first meeting hosted in Colorado Springs (U.S.) in November 2006 by the U.S. Anti-Doping Agency and the U.S. Olympic Committee.

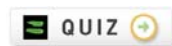
## Free Educational Tool: Doping Quiz Link Program

Through WADA's "Doping Quiz Link Program," stakeholders can put the Doping Quiz on their organizations' Web sites, giving athletes and members of the athlete entourage visiting these sites a fun and interactive way to learn more about the dangers of doping and their responsibilities under the World Anti-Doping Code.

Stakeholders simply follow a few easy steps to select the Doping Quiz "Web Sticker" they prefer from several options available (see samples below), and the Doping Quiz becomes a part of the Web site, giving stakeholders another way to ensure that their athletes have the opportunity to learn about anti-doping.

The Doping Quiz, which operates in 15 languages, serves as the foundation of the Athlete Outreach Program that WADA takes to major international sporting events including the Olympics, Paralympics and many World Championships.

Visit WADA's Web site at [www.wada-ama.org](http://www.wada-ama.org) to get started!



## Fourth IF Symposium Meets with Success

On March 27–28, 2007, WADA hosted its fourth annual International Federation Anti-Doping Symposium at the Olympic Museum in Lausanne (Switzerland). This symposium enables anti-doping experts from International Sports Federations (IFs) and WADA to exchange proposals for improvements, information and opinions on various issues linked to the fight against doping and its administration.

This year, so as to make the symposium as interactive as possible, emphasis was placed on case study workshops in three main areas: results management and

sanctions; issues linked to the management of the fight against doping on a day-to-day basis, such as athlete whereabouts, targeted testing and Therapeutic Use Exemptions (TUEs); and how to create annual anti-doping education programs for individual IFs.

Other more traditional sessions dealt with the current revision of the World Anti-Doping Code; WADA's worldwide development program through the creation of Regional Anti-Doping Organizations; and the implementation of ADAMS, the Anti-Doping Administration and Management System created by WADA to facilitate stakeholders'

day-to-day management of anti-doping activities. Following the Symposium, WADA also held a two-day ADAMS training session.

Over 80 participants representing some 50 IFs took part in the 2007 Symposium. Next year, the Symposium will be held on April 1–2, in Lausanne, in a slightly different format. On day one, WADA and the IFs will meet, while a concurrent session of the Association of National Anti-Doping Organizations will be held in another venue in Lausanne. And on day two, a joint meeting will be held for the IFs, National Anti-Doping Organizations and WADA.

NEW!

**WADA Program Calendar. For the most current updates, visit [www.wada-ama.org](http://www.wada-ama.org)****ATHLETE OUTREACH**

WADA's Athlete Outreach program raises awareness and encourages doping-free sport through direct interaction with athletes at major sporting events worldwide.

|                       |  |                               |
|-----------------------|--|-------------------------------|
| <b>July 11–23</b>     | <b>All Africa Games</b>  | <b>Algiers, Algeria</b>       |
| <b>July 13–29</b>     | <b>Pan American Games</b>  | <b>Rio de Janeiro, Brazil</b> |
| <b>August 8–18</b>    | <b>World University Games</b>  | <b>Bangkok, Thailand</b>      |
| <b>Oct. 28–Nov. 3</b> | <b>UNESCO-WADA Anti-Doping Education Program for Young Athletes (Tennis)</b> | <b>Washington, DC</b>         |

**INDEPENDENT OBSERVERS**

The Independent Observer (IO) program helps enhance athlete and public confidence at major events by randomly monitoring, auditing and reporting on all phases of the doping control and results management processes.

|                   |                           |                               |
|-------------------|---------------------------|-------------------------------|
| <b>July 11–23</b> | <b>All Africa Games</b>   | <b>Algiers, Algeria</b>       |
| <b>July 13–29</b> | <b>Pan American Games</b> | <b>Rio de Janeiro, Brazil</b> |

**CODE REVIEW & CONSULTATION**

The World Anti-Doping Code (Code) represents one of the most important achievements to date in the fight against doping in sport. The Code is the core document that provides a framework for harmonized anti-doping policies, rules and regulations among sports organizations and public authorities. Building on the experience gained to date and to further advance anti-doping efforts, WADA has initiated a Code consultation period, similar to that used in its development, for a practical review of its provisions and fine-tuning them to enhance anti-doping programs. The Code consultation process commenced in April 2006 and has now entered its third and final stage of consultation.

|                       |   |                         |
|-----------------------|---|-------------------------|
| <b>June–July</b>      | <b>Third Consultation Phase</b>   | <b>Montreal, Canada</b> |
| <b>October 15</b>     | <b>Final draft revision posted online</b>   | <b>Montreal, Canada</b> |
| <b>November 15–17</b> | <b>Final draft revision submitted for adoption, Third World Conference on Doping in Sport</b> | <b>Madrid, Spain</b>    |

**ANTI-DOPING PROGRAM DEVELOPMENT**

WADA works with stakeholders to facilitate the establishment of strong anti-doping programs in sports and regions throughout the world. The following are meetings of various development programs, including those of Regional Anti-Doping Organizations (RADOs).

|                     |  |                          |
|---------------------|--|--------------------------|
| <b>July 18–19</b>   | <b>West Asia RADO Project Team Meeting</b> | <b>Jordan</b>            |
| <b>August 28–29</b> | <b>Eastern Europe RADO Board Meeting</b>   | <b>Kiev, Ukraine</b>     |
| <b>September 4</b>  | <b>South East Asia RADO Board Meeting</b>  | <b>Brunei Darussalam</b> |

**ADAMS TRAINING**

ADAMS (Anti-Doping Administration & Management System) is the web-based database management system that coordinates anti-doping activities worldwide. WADA hosts training sessions for stakeholders adopting the ADAMS system.

|                      |                              |
|----------------------|------------------------------|
| <b>September 4–5</b> | <b>Lausanne, Switzerland</b> |
| <b>September 8–9</b> | <b>Bucharest, Romania</b>    |

**EDUCATION TRAVELING SEMINAR**

WADA's Traveling Seminars raise understanding about anti-doping efforts, disseminate general information about anti-doping in sport and offer guidance and practical tools for initiating or enhancing anti-doping education programs among WADA stakeholders throughout the world. *The dates below are subject to change. For the most current information, please contact [info@wada-ama.org](mailto:info@wada-ama.org).*

|                      |                            |
|----------------------|----------------------------|
| <b>August 6–7</b>    | <b>Santiago, Chile</b>     |
| <b>August 9–10</b>   | <b>La Paz, Bolivia</b>     |
| <b>August 13–14</b>  | <b>Panama City, Panama</b> |
| <b>October 17–18</b> | <b>Abuja, Nigeria</b>      |
| <b>October 22–23</b> | <b>Accra, Ghana</b>        |
| <b>October 26–27</b> | <b>Bamako, Mali</b>        |

**THIRD WORLD CONFERENCE ON DOPING IN SPORT**

The deadline for registering for the Third World Conference on Doping in Sport is 15 August 2007. Visit the conference Web site at [www.wadamadrid2007.com](http://www.wadamadrid2007.com) for details on registration, participation guidelines and accommodations (see related article, p.33). **November 15–17, 2007. Madrid, Spain.**

**WADA INFORMATION/EDUCATION SESSION**

In cooperation with the Indian Ministry of Youth Affairs and Sports, WADA will host an extensive program to inform government and sport stakeholders and other interested parties from the region about the importance of the fight against doping in sport and stakeholders' respective responsibilities under the World Anti-Doping Code. **October 5–6, 2007. Patiala, India.**