Advances in Anti-Doping Science

Newsletter | National Dope Testing Laboratory

VOL 3 | ISSUE 1 | DECEMBER, 2023

Azadi Ka Amrit Mahotsav

G20 भारत 2023 INDIA



NDTL

Published by: National Dope Testing Laboratory, Government of India

CONTENTS







Director's Message

National Dope Testing Laboratory (NDTL)

- → Introduction and Objectives
- → Testing of Dope Control Samples

Research Activities

- → Research and Innovations in Anti-Doping Science
- → Synthesized Reference Materials in the year of 2023
- → Publications, Patent and Poster Presentations

New Addition

- → Inauguration of New Cold Room & Cafeteria 2023

Important Meeting

- → Governing Body Meeting
- → WADA Laboratory Director's Meeting and WADA Annual Symposium
- → WAADS QA Managers Meeting 2023
- → Scientific Advisory Board (SAB) meeting
- → Invited Lecture by Director
- → 22nd Annual USADA Symposium in Paris

Important Celebration

- → International Yoga Day Celebration - 2023
- → Participated in the Sport India 2023 Exhibition
- → Independence day celebration
- → National Sports Day Celebration
- → Vigilance Week and National Unity Day

Awards

- → NDTL Received Third Position for Swachhata Pakhwada Award-2023

Article

- → Probable Causes for Inadvertent Doping in India

External & Internal Trainings

Role of Scientists in Anti-Doping Tests at National Dope Testing Laboratory

Anti-Doping Education Resources



Director's Message

The National Dope Testing Laboratory (NDTL), Government of India, New Delhi a dedicated secure area in South Delhi, has always been a hub of innovations in research management and serving the country for the past 15 years in the capacity of Anti-doping Analysis facility in Sports. It has made tremendous progress in many scientific areas ranging from up gradation of Research in terms of Analytical Methods Development and Rarely available Reference Materials (RM) synthesis from collaborative research with two premier research institutes like CSIR-IIIM, Jammu and NIPER-Guwahati.

I am optimistic that the current staffs of talented professionals will bring laurels to the organization and continue the progress of Anti-Doping science at NDTL. The NDTL has synthesized a total of 15 rarely available Reference Materials (RMs) collaboration with these two scientific research and education institutes. The Laboratory is advancing this success steadily in a highly competitive manner by way of synthesis of more RMs, recognition of Scientific and Industrial Research Organization (SIROs) & Patents etc.

The infrastructure and manpower is being constantly upgraded to meet the Laboratory requirement for carrying out advanced Research & Development activities and through other proposed setup like Athlete Passport Management Unit (APMU) is under progress. The NDTL will have its statutory entity under the umbrella of National Anti-Doping Act 2022, which would further strengthen the Anti-Doping System in India.

The Laboratory has been contributing immensely in the area of Anti-Doping Science and Automation in doing analysis, Also our efforts are fully aligned with various national initiatives that cater to every strata of the society while translating knowledge into aiding sports and contributing to the progress of the Nation.

You are required to kindly explore our website, I hope you would be able to find all the information you are looking for, and more, about your vibrant learning community that is socially engaged as well in Anti-Doping Science.

I am thankful to our Governing and General Body Member, Scientific Advisory Board Members and Finance Committee who guided and supported us in its historic endorsement.

I am also thankful to the Government of India for providing all timely support and encouraging NDTL to move forward with significant momentum.

With Best Wishes

Dr. P. L. Sahu
Director & CEO(I/c)

National Dope Testing Laboratory (NDTL)

Introduction and Objectives

NDTL is accredited to the National Accreditation Board for Testing & Calibration Laboratories (NABL) for ISO/IEC: 17025 and the World Anti-Doping Agency (WADA) for testing of urine & blood samples from human sports.

NDTL is a premier analytical testing laboratory and one of the World Anti-Doping Agency (WADA)-accredited Laboratories dedicated to human sports dope testing & allied research. This is the only laboratory of its kind in the country having state-of-the-art facilities with continual upgraded procedure and infrastructure as per WADA guideline. It is equipped with the latest and sophisticated analytical equipment including LC-Orbitrap-HRMS, LC-MS/MS, GC-MS/MS, GC/C/IRMS, etc. The Laboratory is pursuing research in the advanced areas of Anti-Doping science and establishing collaborations with National and International Institutes. The Laboratory engages Research Associates for further strengthening of the research activities. With these facilities the NDTL currently achieved 5000 samples per year, in the future plane is approx. 8000 per year.

The Laboratory is located within precincts of the JLN Stadium Complex, near Gate No. 10 with an area of 2700 sq. meters. It has excellent facilities with the state-of-the-art technology and equipment for testing of dope samples as per the requirements of WADA.

There are 30 WADA -accredited labs in the world, out of which six are in Asia. The NDTL is one of the six laboratories in Asia accredited by WADA. The other laboratories in Asia are in China, Japan, Korea, Qatar and Thailand.

The accreditation of WADA is granted on yearly basis, and is based on the evaluation of the proficiency testing participation results for the particular year.

Consistently striving for excellence, NDTL regularly updates its



Picture 1. NDTL building, JLN Stadium, Delhi India

equipments and enhances the skills of the analytical personnel. The Laboratory is equipped with highly sophisticated instruments like Flow Cytometry (Sysmex-XN1000), Cobas e 411 analyzer, IMMULITE 1000 Immunoassay System, AutoLumat LB 953 Ultra Sensitive Automatic, Tube Luminometer, BlotCycler Touch, Bandmate Automated Western Blot Processor. FujiFilm LAS-4000 Luminescent Image Analyzer etc. as responsible for testing of urine & blood samples from human sports. NDTL is participating in various External Quality Assurance Scheme (EQAS) like World Anti-Doping Agency (WADA), World Association of Anti-Doping Scientists (WAADS) and Swiss Centre for Quality Control (CSCQ). Meanwhile, NDTL shares its expertise with many countries and extends dope testing services for over a 6 countries in Asia and beyond.

Testing of Dope Control Samples

Doping refers to the use of prohibited substances or the adoption of prohibited methods by athletes to enhance their performance and gain an unfair advantage over their competitors. The allure of achieving record-breaking feats or securing prestigious titles has, unfortunately, lead some athletes to resort to doping as a means to reach their goals. The history of doping can be traced back to ancient times when athletes consumed various substances, such as stimulants, to enhance their performance. However, it was not until the mid-20th century that the problem gained significant attention and prompted the establishment of anti-doping organizations and regulations.

Doping poses a significant threat to the integrity of sports and undermines the fundamental principles of fair play, honesty, and equality. Athletes who engage in doping not only compromise their own health and well-being but also undermine the spirit of competition, casting doubts on the authenticity of athletic achievements.

To combat these issues, numerous international bodies, including the World Anti-Doping Agency (WADA), have been established to develop and enforce stringent anti-doping policies. These policies encompass comprehensive testing procedures, strict regulations on substances and methods, and severe penalties for those found guilty of doping.

Despite these efforts, doping remains a persistent problem in the sporting world. Advancements in science and technology have made it increasingly challenging to detect certain doping substances and methods, leading to a constant cat-and-mouse game between doping offenders and anti-doping authorities. The battle against doping requires a collaborative and multifaceted approach, involving education, prevention, detection, and punishment. The laboratory received dope test samples from National Anti-Doping Agency (NADA), India and from other testing Authorities.

Dope Control Samples

Berlinger Kit

Versapak Kit









Research Activities

Research and Innovations in Anti-Doping Science

In dope testing analysis, the availability of Reference Materials (RMs) / Standards are critical. Reference Materials of the prohibited substances are available only selected manufacturers across the world, and not easily available commercially, some of them not available worldwide. The Reference Materials of prohibited substances are used essentially during dope-testing for quality control purposes, and, so their availability remains critical in sports dope testing, globally. As India was not manufacturing of various Reference Materials within the country, NDTL was importing these rarely available Reference Materials from other countries of the world so far for its doping analysis at a huge cost.

In the last three years, NDTL has taken several initiatives towards strengthening its research activities in collaboration with premier Scientific Institutes in India for synthesis of Reference Materials or metabolites, which are highly pure chemical compounds used for dope testing, in a phased manner. As of now NDTL successfully synthesized 15 reference materials in the country for the first time and various under pipeline.

The innovation reached globally. These 15 Reference Materials have been shared with all 30 WADA accredited Laboratory as a part of **"Vasudhaiva Kutumbakam".** It will boost research and development activity, generate more scientific talents and thus, it gainful employment in Dope Testing Laboratory leading to substantive economic growth.

Particularly in the year 2023 following Reference Materials were synthesized with collaborative research with two premier institutes.

Synthesized Reference Materials in the year 2023

1. YK-11 Metabolite-1 (S1. 2 other Anabolic Agents)

2. GHRP-1. (S2:2.4 Growth hormone releasing factors)

3.Oxandrolone Metabolite-2 (Ox-M2) - (S1.1 Anabolic androgenic steroids (AAS))

Publications

1. **Development and validation of a novel chiral chromatographic method for separation of lenalidomide enantiomers in human plasma, 35(2), 2023, 83-91.**

Authors:

Gyan Vardhan, Vikas Kumar, Puran Lal Sahu, Anuj Prakash, Uttam Kumar Nath, Shailendra Handu, Puneet Dhamija

2. **Synthesis and characterization of octopamine sulfate, norfenefrine sulfate and etilefrine sulfate reference materials for doping control.**

Authors:

Subarna Jyoti Kalita,a Sachin Dattram Pawar,b Prachi Vernekar,b Mayur Arun Pawar,a KS Veena,a KM Abha Mishra,a Kalyan Kumar Sethi,a P. Radhakrishnanand,b Upadhyayula Suryanarayana Murty,a,b Puran lal Sahu,c Sachin Dubey,c Kapendra Sahu,c Awanish Upadhyay,c Rajesh Kumar Koric and Pramod Kumarb

Patent Filed

Patent entitled : Synthesis of 17-ketoprostanozol

Application no. : IN202311059079 filed on 1st September 2023

By

1. NDTL, New Delhi

2. CSIR-IIIM, Jammu

The following poster was presented at Cologne workshop in 2023

1.

"Effect of Mefenamic Acid on Urinary Endogenous Anabolic Androgenic Steroid Profile."

Authors:

Arpit Soni, Savita Rani, Puran Lal Sahu

2.

"Synthesis and characterization of 17α-hydroxymethyl-17β-methyl-18-nor-2-oxa-5α-androst-13-en-3-one (Oxandrolone M2), a long-term metabolite via a Gartner's reaction approach."

Authors:

Puran Lal Sahu, Tarun Handa, Kapendra Sahu,Arpit Soni,Rajesh Kumar Kori,Sheena Mahajan,Ashiq Hussain Padder,Utpal Nandi,Qazi

3.

"Synthesis and Characterization of Ostarine Metabolite: Applicable for TL 12."

Authors:

Puran Lal Sahu, Ramkishore Matsa, Sachin Pawar, Kapileswar Seth, P. Radhakrishnanand, USN Murty, Tarun Handa, Awanish Upadhyay, Kapendra Sahu, Rajesh Kumar Kori, Pramod Kumar

4.

"Comprehensive identification method of Hypoxia-inducible factor (HIF) avtivating agent."

Authors:

Awanish Kumar Upadyay, Akhilesh Bhardwaj, Puran Lal Sahu

New Addition

Inauguration of New Cold Room & Cafeteria in NDTL on 27th March 2023



New Cold Room has been constructed for enhancing the welfare of the employees of the NDTL. It has been inaugurated by the Hon'ble Minister of State, Youth Affairs and Sports in the presence of Secretary, Department of Sports and other senior officers of the Ministry.



Important Meeting

Governing Body Meeting

17th Governing Body Meeting was held at NDTL dated on 27.03.2023 Chair by the Hon'ble Minister of State, Youth Affairs and Sports in the presence of Secretary, Department of Sports and other senior officers of the Ministry.



17th Governing Body meeting of NDTL held on 27.03.2023

WADA Laboratory Director's Meeting and WADA Annual Symposium

Director & Sh. Arpit Soni, Scientist-C, National Dope Testing Laboratory (NDTL) were participated in the WADA Laboratory Director`s meeting held on 12-13th March, 2023 and WADA Annual Symposium was held on 14-15th March, 2023 in Lausanne, Switzerland.





Important Meeting

WAADS QA Managers Meeting 2023

WAADS QA Managers Meeting was organised by DoCoLab, U-Ghent, Belgium on 13th & 14th April 2023. Meeting was attended by Total 50 Participant from 30 countries. Behalf of NDTL, New Delhi, Dr. Shaily Bhargava, Quality Manager & Dr. Anandarajan T, Scientist-B and Deputy Quality Manager have attended the meeting .



Scientific Advisory Board (SAB) Meeting

Scientific Advisory Board (SAB) meeting: 6th Scientific Advisory Board Meeting was held at NDTL on 07th June 2023 wherein agenda items like renewal of MoUs for Collaborative projects on synthesis of Reference Materials (RMs) with NIPER, Guwahati and CSIR-IIIM, Jammu for another 3 years, recruitment of JRFs/SRFs and Proposal for purchase of new instruments were extensively discussed. Good inputs and suggestions were provided by all the Board members as well as Dr. Okano Masato, Special invitee from Anti-Doping Laboratory, Tokyo, Japan.

Delivered a lecture on "Anti-Doping Science : Challenges and Innovations" at 25th Annual Forensic Science Conference organised by National Forensic Science University (NFSU), Gandhinagar, Gujarat on 3 February 2023.

Delivered a lecture on "Dope Testing" during 'Hand-on Training on Sophisticated Analytical Instruments for Evaluation of Drugs and Pharmaceuticals' organised by AIC-LMCP Foundation for analysts of Food and Drug Laboratory, Vadodara on 2 February 2023.

Important Meeting

Invited Lecture

Director, NDTL was invited by Forum of Pharma Quality Leaders meet-2023 held at Goa on 10 June 2023 to deliver a lecture on “Dope Testing: Science, Challenges and Documentation”. The Quality leaders from more than 50 Pharmaceutical companies participated in the meet.





Lecture by Director

The Director, NDTL was invited by Indian Pharmacology Society to deliver a talk on **“Anti-Doping Science : Growing Research Opportunities”** in International Pharmacology Conference IPCON 2023 which was organised by Hanagal Shri Kumareshwar College of Pharmacy, Bagalkote in association with Indian Pharmacological Society and in Collaboration with S N Medical College Bagalkote from 24 to 26 Aug 2023 with the theme **'New Modalities and challenges in Drug Discovery and Therapeutics: Noval approaches for Global Health Care'**


International Pharmacology Conference IPCON 2023 on dated 24 to 26 Aug



International Pharmacology Conference IPCON 2023 on da



International Pharmacology Conference IPCON 2023 on dated 24 to 26 Aug

Lecture was given by the Director, NDTL in “Two days National Workshop on Latest Trends in NDPS on the occasion of International Day against Drug Abuse and Illicit Trafficking” organized by National Forensic Sciences University, Goa Campus on 26th – 27 June 2023

22nd Annual USADA Symposium in Paris

Dr. P. L. Sahu, Director and CEO (I/c) National Dope Testing Laboratory (NDTL), Department of Sports, Ministry of Youth Affairs and Sports (MYAS) for Government of India, participated in 22nd Annual USADA Symposium on Anti-Doping Science was held on 29 September -1st October, 2023 in Paris, France.

The theme of Symposium was “Revisiting Oxygen Transport Manipulation and Blood Doping Detection : Who's Winning ?”.

The Symposium was attended by many Laboratory Directors of WADA accredited laboratories, NADOs and other Scientific Experts.

It was very effective scientific symposium and the following areas were discussed:

- Blood doping and detection
- From Molecular Biomarkers to Cellular Biomarkers
- Recent trend in Blood Doping
- Methods from Blood transfusion
- RNA markers in RBC for Doping Control in Blood
- I&I and ABP
- Dried Blood Spot
- APMU work
- Advancemement of Direct Mass Technology

There was also presentation held on Paris Olympic 2024 Games by French Anti-Doping Organisation and Laboratory. The participants got an opportunity to visit the newly established Laboratory.



Important Celebration

International Yoga Day Celebration- 2023

On the occasion of International Day of Yoga, National Dope Testing Laboratory has organised Yoga Session for the employees of NDTL. Yoga teacher Mr. Arvind Kumar demonstrated the yoga poses. The yoga session was started at morning 08.00 AM in the campus of NDTL. Around 36 participants have joined in the yoga session with warm enthusiasm.

Yoga in the Workplace: Boosting Well-Being and Productivity

Yoga isn't just for serene mountaintops; it has tangible benefits for employees too! Here's how:

Stress Relief: Yoga helps employees manage stress and tension, leading to improved focus and better sleep.

Enhanced Well-Being: Regular practice boosts overall well-being and mental health.

Reduced Blood Pressure: Yoga contributes to lower blood pressure levels.

Creativity Boost: Yoga sparks creativity, making the workplace more innovative.

Improved Morale: Happier employees mean better morale and teamwork.

Less Pain: Yoga alleviates physical discomfort.

Increased Energy: A quick yoga session recharges tired minds.

Better Focus: Enhanced concentration leads to higher productivity.

Team Building: Yoga fosters camaraderie among colleagues.

Happiness Factor: It simply makes employees happier!

Confidence Boost: Yoga builds self-assurance.

Fewer Absences: Regular practice reduces absenteeism



Important Celebration

Participated in the Sport India Exhibition

Ministry of Youth Affairs and Sports had organized India's biggest Sport and Fitness Expo from 14th to 16th December, 2023 at Pragati Maiden, New Delhi- India. NDTL set up a stall in the expo and took active participation.



Independence Day Celebration

Independence day has been celebrated in NDTL. The Chief Guest Honorable Prof. Nirmal Kumar Ganguly, Former Director General (ICMR) was present on this occasion. NDTL Director addressed to NDTL employees.





Important Celebration

National Sports Day Celebration

On the Occasion of National Sports Day on 29th August, Sports Authority of India organized various competition to celebrate the National Sports Day, 2023 on 29th August 2023.NDTL employees took part in various sports and won the medals.





Award



NDTL received third position for swachhata pakhwada award-2023, given by Secretary (Sports), MYAS on 23rd November 2023.

Swachh Diwali Shubh Diwali Campaign



NDTL celebrated Swachh Diwali Shubh Diwali Campaign by signing the **"Swachh Diwali Signature Campaign"** on My Gov. Portal. for clean, green and SUP free Diwali. A rangoli competition was also organized on 10th November, 2023 and all the staff members participated enthusiastically and the prizes were distributed to the top three winners. Ms. Rano Sharma and Ms. Tannu Verma got the 1st prize, Ms. Kamna Sharma and Ms. Swati Sharma got the 2nd prize, Snehaprabha Giri and Ms. Malvika got the 3rd prize.

Vigilance Week and National Unity Day

NDTL Celebrated vigilance week and National Unity from 30th October to 5th November 2023 for the awareness of Public Interest Disclosure and Protection of Informer- PIDPI resolution. A Quiz competition was organized on 3rd November, 2023. All the staff participated in the quiz Programme and prizes were distributed to the top three winners. Mr. Suneel Kumar from QMS got the first prize, Ms. Rano Sharma got the 2nd prize and Ms. Swati from LC-MS/MS section got the 3rd prize.

Vigilance Week Celebration





A quiz competition winner in PIDPI

Probable Causes for Inadvertent Doping in India

Authors:
Sh. Akhilesh Bhardwaj[1], Dr. P.L. Sahu[*]
1-Scientist - B, NDTL, New Delhi, [*]Director CEO (1/c), NDTL New Delhi

Introduction:

Athletes want to win the medal at any cost. Some athletes want to play for professional sports at the other hand some want to win medals for their countries. The pressure to win leads the athletes to use shortcuts (banned drugs in sports) that might give them an edge. These are called performance-enhancing substances. Use of these substances is known as doping in sports. At the same time doping always comes with risks. Aiming success in sports career, athletes overlook health risks associated with the misuse of black market preparations as performance enhancing agents.

There are two types of doping:

Intentional (A player knowingly takes the banned substance) and

Un-intentional (A player unknowingly takes the banned substance)

In 2005, the Government of India formed the National Anti-Doping Agency (NADA) to deal doping in sports in country. NADA India works in close collaboration with national and international stakeholders to ensure clean sport practices, sharing anti-doping resources and augmenting joint efforts towards achieving fair play.

India's anti-doping mechanism is spoiled by low testing; lack of awareness among athletes, coaches and trainers, and the absence of a stringent enough law.

Players use banned performance-enhancing substances as a shortcut when either they lack some naturally capabilities or do not train well.

Doping can provide an athlete some results beyond human limits. Thus, if any player performs extraordinary than his previous record, we should doubt them for doping.

In India, the highest numbers of doping cases are reported in bodybuilding, followed by weightlifting, athletics and wrestling.

Anabolic steroids, hormones, selective androgen receptor modulators, Diuretics, Stimulants are the most frequently utilized banned substances in sports.

In general, most of the drugs sneakily administered by athletes have been developed as therapeutics to treat some ailment. Consequently, the administration of these substances to healthy individuals can result in unfavorable side effects.

In 2005, the Government of India formed the National Anti-Doping Agency (NADA) to deal doping in sports in country. NADA India works in close collaboration with national and international stakeholders to ensure clean sport practices, sharing anti-doping resources and augmenting joint efforts towards achieving fair play.

Probable Causes for Inadvertent Doping in India

How athlete gets these banned drugs?

In past few years, we have reported samples as AAF for new and under developing (under trial) banned substances like LGD-4033, GW1516, Andarine, Ostarine (Enobosarm) etc. The drug preparation is not available in market, even these they are not approved to sale anywhere. So from where an athlete gets these banned drugs?

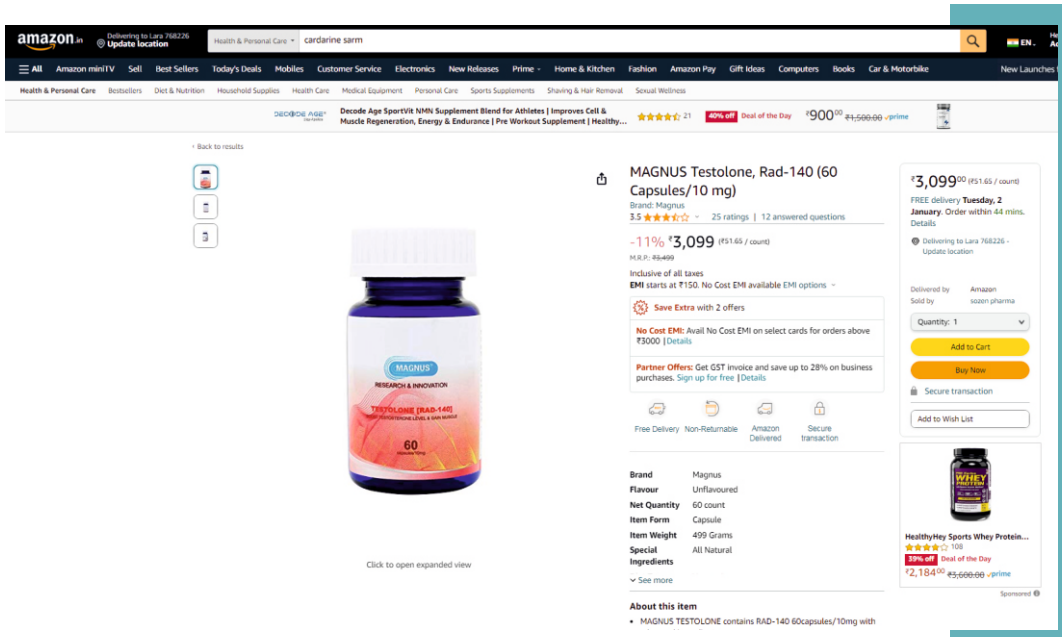
The answer is black market. A black market is hidden and illicit trading system that avoids government regulation. It operates outside the law and is driven by the opportunity for profit and the needs of consumers.

An athlete comes to know with these substances through a friend, their parents or the family doctor who provide the products. Other sources are drug-dealers, a pharmacist, the trainer or the manager of a sports club, a sports teacher and a physiotherapist.

The black market is **illegal and it is potentially dangerous for the health of an athlete**. Black market products and nutritional supplements may contain ingredients with uncertain performance-enhancing properties. Many of these black market preparations are incorrectly labeled, some of them are containing drugs without clinical approval and in some cases no active compounds at all.

There is no effective check system on supplements content in India. Anyone can open and own a local supplement shop with just a license which is granted within 10-15 days for a nominal fee for a year. Some may claim for having lab certified for its contents but it is not a reliable one.

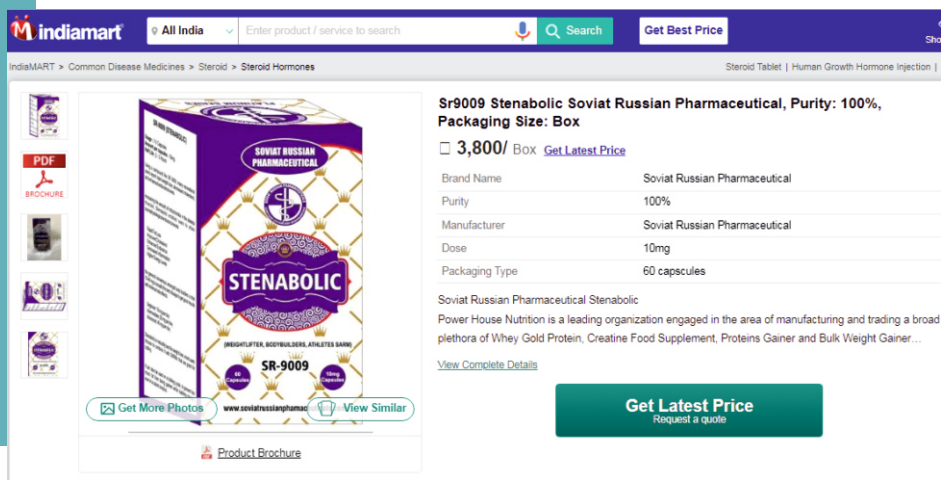
Following are some examples of banned substances which are not approved for sales in India but are easily available in online/offline market in uncontrolled manner:-

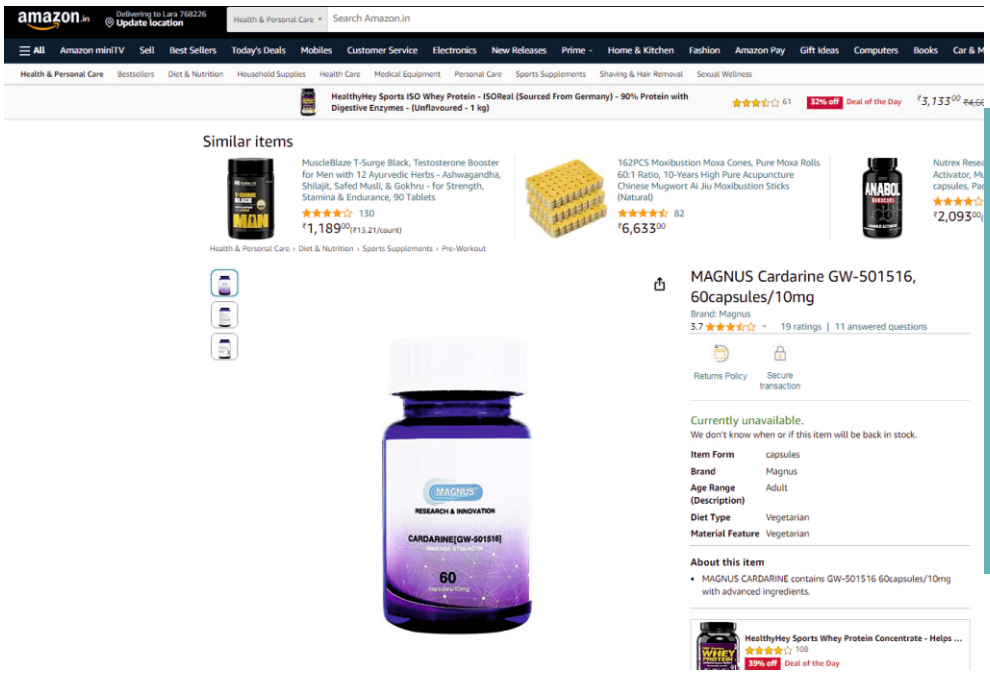


1. **RAD 140** or Testolone is a chemical product under investigation that has not yet received marketing approval. It is a non-steroidal, orally bio-available chemical formulation, a very potent SARM. The manufacturer of this particular SARM - Radius Health - developed it as a Testosterone Replacement Therapy (TRT). Listed product of Amazon.

Probable Causes for Inadvertent Doping in India

2. **SR-9009-** Hormone and Metabolic Modulator, commonly used for increase endurance levels, also boost metabolism and burn fat quickly. Easily available on

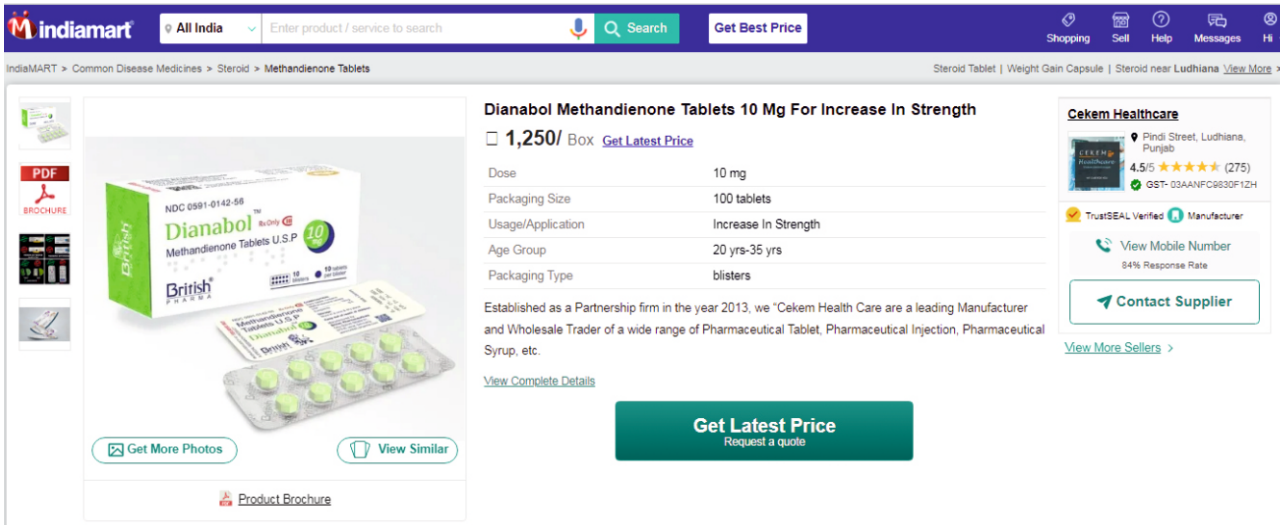




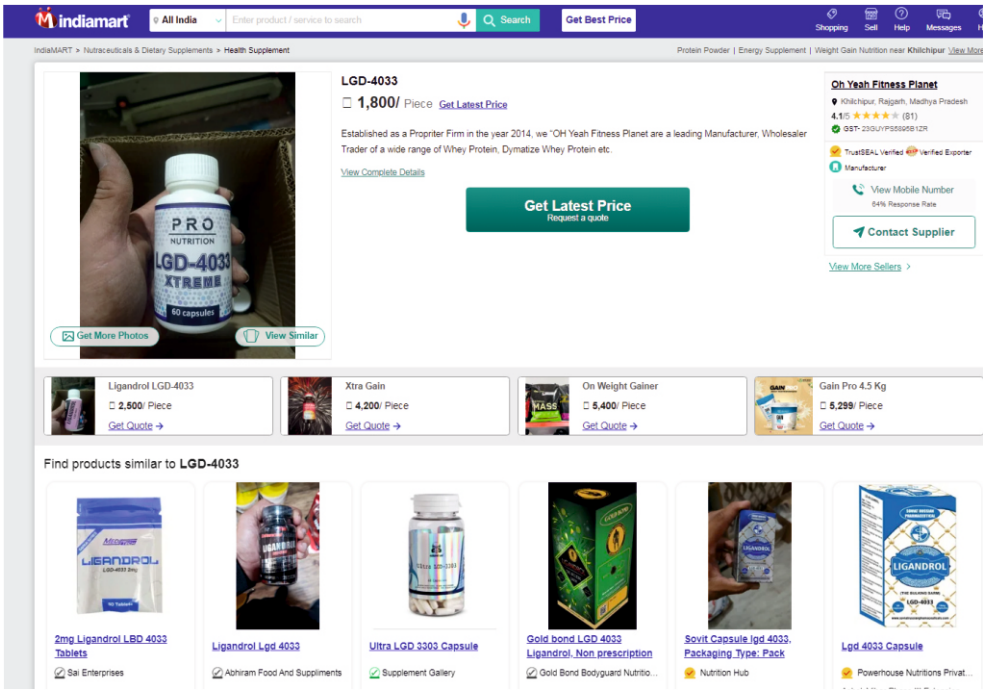
3. **GW-501516-** It is a Selective Androgen Receptor Modulator known by the term SARM. Available on Amazon.

Probable Causes for Inadvertent Doping in India

4. **Methandienone** as Danabol tablets



5. **LGD-4033** is a selective androgen receptor modulator (SARM). While it is currently being investigated as a pharmaceutical treatment for muscle wasting and weakness associated with aging, LGD-4033 has not been approved for clinical use in humans.



6. Andarine is an investigational drug that has not yet been approved by the US Food and Drug Administration (FDA). It is part of a class of drugs called selective androgen receptor modulators (SARMs). Some supplement companies have included and arine in products for bodybuilding.

7. Ostarine (Enobosarm) for athletic performance, involuntary weight loss due to illness, breast cancer, and many other conditions, but there is no good scientific evidence to support these uses. Ostarine is an investigational drug and therefore not approved for any use by the US FDA.

Probable Causes for Inadvertent Doping in India

Case Study

The drug, called GW501516, was originally developed by pharmaceutical company GlaxoSmithKline (GSK) to stimulate muscles to burn fats instead of sugars, in order to raise levels of "good" cholesterol. But the company abandoned further development in 2006 after tests on rats showed that at all doses, the drug rapidly causes cancers in a multitude of organs, including the liver, bladder, stomach, skin, thyroid, tongue, testes, ovaries and womb. "GSK does not manufacture it or authorize its sale".

In 2009, GSK warned WADA of the potential risks of abuse of the drug, and the agency added the drug to its list of prohibited substances that year. The drug is openly promoted on websites for bodybuilders and athletes.
The World Anti-Doping Agency (WADA) has taken the rare step of issuing a warning to athletes after discovering abuse of a black market drug that causes multiple cancers in rodents.

Conclusion

Doping in sports has become a key and complex issue, which requires serious consideration. The high number of positive findings for unapproved substances demonstrates that the black market for performance-enhancing drugs has a considerable volume in India.

The widespread use of doping products and methods have consequences not only on health of the athletes, but also upon the image of sports in the country. Thus, doping in sports is forbidden for both ethical and medical reasons.

Here are some steps to overcome this issue:

- "**Ministry of Youth Affairs and Sports, FSSAI and NFSU sign MoU for setting up the testing facility for dietary supplements."** This MoU will benefit athletes and athlete-support personnel by educating and spreading awareness about inadvertent doping due to prohibited substances present in nutritional supplements.
- Parliament passes the **National Anti-Doping Bill 2022** to provide for the constitution of National Anti-Doping agency as a statutory body for regulating anti-doping activities in sports. It is a landmark occasion when India joins the select group of countries which have their own National Anti-Doping Law. The new Law will ensure highest standards of integrity while participating and preparing for sports competitions, domestically and internationally.
- NADA India has developed a mobile application "Know Your Medicine (KYM)" for both IOS and Android phones. This app is designed to help athletes by informing choices about the medication they may consume/ recommend. The KYM application allows the user to easily search the status of a medicine or its ingredients. This app is in line with the WADA Prohibited List, the application allows athletes to safeguard themselves against inadvertent doping.

External & Internal Trainings

Trainings by International Experts

- General discussion related to WADA audits with Dr. Gloria Munoz Garcia, Madrid Anti-Doping Laboratory, Spain
- Virtual trainings on Inter-Lab Comparison; on GC/C/IRMS data by Dr. Thomas Piper, Cologne Laboratory, Germany
- Virtual QMS trainings on Introduction to WADA Document by Dr.Tiia Kuuranne, Lausanne Laboratory, Switzerland

Internship/Training

Internship & Training were given to Post-Graduate final year students.



Trainings

Two post graduate students Dr. Sagolsem Adarsh Singh and Dr. RamKumar R., from Sports Medicine Department, Regional Institute of Medical Sciences, Imphal have successfully completed 5 days training on "Exposure and Impart Training in the field of Dope Testing area related to sample receiving, analysis and reporting in accordance with ISO/IEC 17025:2017 and WADA ISL 2021" held from August 21, 2023 to August 25, 2023 in NDTL.

Dope Control Officer Training

A training has been provided to Dope Control Officers from NADA on 23rd and 31st of August 2023. Topic was "Non-conformities/Irregularities observed for Biological Samples and discussion as per WADA ISL, ISTI, TD-14, TD2021LCOC etc. Total number of participants were 18 on 23rd August & 21 on 31st August.

Role of Scientists in Anti-Doping Tests at National Dope Testing Laboratory

Doping is the use of prohibited substances or methods to enhance athletic performance. Doping is not only unethical, but also harmful to the health and safety of athletes and the integrity of sports. To prevent and detect doping, anti-doping tests are conducted on urine and blood samples collected from athletes before, during, or after competitions or training sessions.

The scientists and technical staff's members in laboratories of NDTL play a vital role in anti-doping tests. They perform the following functions.

Sample Analysis: The scientists use state-of-the-art analytical instruments and methods to detect the presence of prohibited substances or their metabolites in urine and blood samples. For quality and reliability of results the WADA International Standard for Laboratories and the NABL ISO/IEC 17025:2017 standards are followed.

Research and Development: The scientists conduct research on various aspects of dope analysis, such as developing new methods, validating existing methods, studying the pharmacokinetics and pharmacodynamics of prohibited substances, and identifying new substances or markers of doping[1]. They also publish their research papers in national and international journals and conferences.

Education and Training: The scientists impart education and training to other stakeholders of anti-doping, such as athletes, coaches, sports federations, medical professionals, and anti-doping officials. They also conduct workshops, seminars, webinars, and online courses on various topics related to anti-doping, such as the WADA Code, the Prohibited List, the Therapeutic Use Exemption, the Sample Collection Procedure, and the Result Management Process.[2]

By performing these functions, the scientists and Technical staff's members in laboratories of NDTL contribute to the anti-doping efforts in India and the world. They uphold the values of fair play, honesty, and respect in sports. They also protect the health and rights of athletes and promote a clean and drug-free sporting environment.

Source: 1,2-Wikipedia,

Anti-Doping Education Resources

Here are some resources that could be useful for anti-doping education.

National Anti-Doping Agency (NADA)

The NADA is responsible for promoting, coordinating, and monitoring the doping control program in sports in India. They have a range of anti-doping education resources available on their website, including the NADA Anti-Doping Rules, the List of Prohibited Substances and Methods, and the Doping Control Process. You can find these resources at nada.nic.in.



Anti-Doping Education and Learning platform (ADEL)

ADEL is a comprehensive learning platform created by the World Anti-Doping Agency (WADA) that hosts webinars, online courses, guides, check lists, factsheets, and other resources for anti-doping education. It is designed to provide athletes, coaches, and other stakeholders with the knowledge and tools they need to promote clean sport and prevent doping. You can visit the ADEL website at adel.wada-ama.org.



National Dope Testing Laboratory (NDTL)

Government of India

J.L.N. Stadium Complex, East Gate No. 10, Near MTNL Building, New Delhi-110003, India
Tel: +91 11 2436 8850, +91 11 2436 5530 | Email: ndtlindia@nic.in | www.ndtlindia.com

सत्यमेव जयते

राष्ट्रीय डोप परीक्षण प्रयोगशाला NATIONAL DOPE TESTING LABORATORY ndtl NEW DELHI नई दिल्ली