Forensic Toxicology
Laboratory
PROFILE OF THE FORENSIC TOXICOLOGY LABORATORY

Background

The University of Pretoria traditionally has a strong drive towards the assistance of our community. In recognition of its responsibility towards the community, the University initiated and funded a fully functional ISO 17025 accredited Forensic Drug Testing Toxicology Laboratory in the Department of Chemistry on its Hatfield Campus.

The abuse of illegal substances is an ever-increasing phenomenon in South Africa. Corrective action and legal procedures require reliable identification of the active ingredients in illegal formulations and biological samples.

To address the current need in our country, a fast and cost-effective response is of utmost importance. The Forensic Toxicology Laboratory has the ability and expertise to achieve exactly this objective. Business Enterprises at University of Pretoria (Pty) Ltd (BE at UP) facilitates effective business solutions through innovative contract research and consulting. The demand for training in this field can also be met with the Forensic Toxicology Laboratory being affiliated to the University of Pretoria.

Mission

The provision of a cost-effective, professional and unbiased scientific service to the community in the field of forensic toxicology.

Services offered by the Forensic Toxicology Laboratory

The Forensic Toxicology Laboratory is equipped with state-of-the-art technology and can perform confirmatory analysis for illicit compounds in drug formulations, body fluids (urine/blood/saliva) and hair. This facility is also the first laboratory in South Africa that can perform hair analysis to test for the presence of drugs-of-abuse. We are willing to issue an affidavit, which can be used in disciplinary hearings and court proceedings.

The personnel of the laboratory also provide expert consultation and witnessing in the field of forensic toxicology for purposes of court testimony.

A large number of organisations are served, ranging from private industry for workplace drug testing, to governmental organisations, schools as well as private individuals.

The personnel of the Forensic Toxicology Laboratory present lectures on workplace drug testing at seminars under the auspices of Continuing Education at University of Pretoria on a regular basis.
This is also done on request of individual companies. The topics that are addressed include the legal, ethical and scientific aspects of workplace drug testing. Guidelines regarding policy development are also included.

**Facilities**

The facility is equipped with state-of-the-art gas chromatography-mass spectrometry (GC-MS) equipment, which is without a doubt the gold standard for confirmation of presumptive positive screening tests. The GC-MS test provides the highest level of confidence regarding the test results. This testing procedure is not subjected to interferences and if employed in a scientifically correct manner, it provides a result that can be regarded as a “fingerprint” of an illicit compound in urine.

Other techniques also available in this facility are high performance liquid chromatography (HPLC), infrared (IR) and ultraviolet/visible (UV/VIS) spectrometry, as well as nuclear magnetic resonance (NMR).

**Testing for drugs-of-abuse in humans**

Testing for drugs-of-abuse has numerous pitfalls and should therefore be approached in an ethically and scientifically correct and legally defensible manner. If these criteria are not met, all parties involved may be harmed. On the one hand an innocent individual may be accused falsely or, on the other, a guilty drug-abuser may go undetected.

The current internationally accepted philosophy for the detection of drugs-of-abuse in biological samples involves a two-stage testing procedure:

- **A preliminary test:** These tests, also called screening tests, involve immuno-chromatographic or enzymatic colour-strip testing. Typical testing kits can be obtained from chain stores, pharmacies or pathology companies. The results of these tests can, at most, be regarded as preliminary since these tests are well-known to be subjected to interference by other similar (and sometimes legal) compounds and can also be masked by some formulations taken on purpose.

- **A confirmatory test:** These tests should be performed by a laboratory specialising in drugs-of-abuse testing to provide a conclusive test result. Confirmatory tests can also be obtained directly without screening tests being performed first.

**How the Forensic Toxicology Laboratory can help**

The Forensic Toxicology Laboratory is proud to offer a drug-testing procedure that is legally defensible. This procedure falls
in the category of confirmatory tests, which are crucial to confirm the results obtained by in-house preliminary testing kits.

As part of our services we are willing to assist and guide clients through the ethical aspects and legally defensible sampling protocol.

**Voluntary written consent**

The individual undergoing the drug test has to provide written consent. In the case of a minor, the parent needs to give written permission. A copy of the informed consent document is available on request or can be obtained from our website in all official languages (www.be.up.co.za/forensicanalysisforms). This requires punctual completion before the sample is voided.

**Sampling protocol**

The sampling protocol is based on international principles and is designed to ensure that the entire drug-testing process is capable of legal scrutiny. It also provides safeguards to protect specimen donors, and accurate and reliable information about a donor’s legal/illegal drug use. The sampling protocol ensures that the specimen is:

- freshly voided;
- not subjected to contamination during the sampling procedure;
- protected against tampering and adulteration;
- traceable back to the donor.

The donor’s written informed consent and permission that the results may be communicated to a third party is a prerequisite.

Our personnel will happily assist you with sampling in a legally defensible manner at our facilities. However, educators/responsible persons can also perform this task at their own facilities, provided that they take responsibility and are willing to testify to the procedure. The sealed urine sample can then be shipped to our Forensic Toxicology Laboratory at the University of Pretoria.

In cases of a confirmation not for legally defensible purposes but where, say, parents want to confirm their child’s results and do not have any legal action in mind, the legally defensible sampling collection procedure is not required. However, please take note of the pitfalls that can hamper reliable urine collection for drugs-of-abuse analysis.

A copy of the Legally Defensible Sampling Protocol is included in our forensic urine drug sampling kit or can be obtained from www.be.up.co.za/forensicanalysisforms.
BE at UP draws on the expertise of 140 disciplines from nine faculties of the University of Pretoria in offering contract research and consulting services. With this unique blend of practical and academic expertise, BE at UP offers a multidisciplinary range of scientifically informed and evidence-led solutions.

BE at UP has the ability to provide business-to-business solutions across the full life cycle of services from project conceptualisation to delivery and capacity building.

A profile of selective services include:

- advance quantitative analytics;
- agricultural economics;
- asset integrity management;
- bioinformatics;
- client conservation modelling;
- data science;
- energy efficiency management (M&V);
- forensic analysis;
- genomics;
- monitoring and evaluation;
- organisational design;
- sensory food science;
- skills assessment;
- specialised engineering advice;
- structural testing;
- vibration monitoring.