ABSTRACTS

Forensic Toxicology – protecting our community

Jason Tran, Senior Scientist

Forensic Toxicology Laboratory, NSW FASS

The role of the Forensic Toxicology laboratory is to use various disciplines of chemistry to assist in explaining the unknown, for both the judicial system and in the interests of public health. Whether it be analytical chemistry, organic chemistry or biochemistry, the use of Forensic Toxicology to provide answers is growing and ever changing. The ever-growing emergence of Novel Psychoactive Substances (NPS) and the continuing evolution of technology means that method development for the detection of NPS is a never-ending crusade. Case studies, advancement in technology and improvement in efficiencies will demonstrate how the Forensic Toxicology Laboratory at NSW Health Pathology Forensic & Analytical Science Service help in providing answers for the Courts, to protect the community and provide closure to those whom have lost loved ones.

Non-targeted analysis approaches for the detection of novel psychoactive substances (NPS)

Professor Shanlin Fu

Centre for Forensic Science, University of Technology Sydney (UTS)

The world is facing a new wave of novel psychoactive substances (NPS). Recreational use of these NPS is an ongoing challenge across a wide range of health, social, legal and law enforcement fields. By the end of 2020, there are 1047 NPS that have been reported to the UNODC Early Warning Advisory on NPS by governments, laboratories and partner organisations. The major challenges of testing NPS include i) the large and ever-increasing number of NPS available in the illicit drug market; ii) the lack of structural knowledge on newer NPS; and iii) the absence of databases and commercial reference materials for compound identification. There is a need for the

development of non-targeted analysis methods to screen these newly emerging substances without reliance on databases and reference standard materials.

Research effort and progress made at the Centre for Forensic Science, UTS in developing non-targeted analysis strategies for detecting NPS will be presented. Our approaches range from the use of high-resolution mass spectrometry and machine learning to the development of the old-school chemical colour reactions. Examples for these various approaches in advancing the field of drugs of abuse testing will be given.

Technical Forensic Support Unit – NSW Police Force

Joshua Stephen Van Vorst, Technical Forensic Analyst

TFSU – Forensic Evidence and Technical Services Command, Forensic Evidence and Technical Services Command, Crime Scene Services Branch, NSW Police Force

The Technical Forensic Support Unit (TFSU) is part of the Crime Scene Services Branch of the NSW Police Force.

Staff in the TFSU predominantly attend clandestine drug laboratories across the state of NSW. They conduct in-field analysis of chemicals using portable instrumentation, including Fourier Transform Infrared (FTIR) Spectroscopy, Raman Spectroscopy, gas detection, Ion Scan Spectroscopy and also perform some wet chemical tests for presumptive identification.

The unit renders chemical processes safe in hazardous, uncontrolled environments and gathers forensic evidence at clandestine drug laboratories. They also provide onsite and formal expert advice and reporting regarding illicit drug manufacture, i.e. chemical processes, methodologies and apparatus being used.

Further to this, the unit provides technical support to the Crime Scene Services Branch in response to other hazardous substance incidents such as CBRN, Post Blast and Home-Made Explosives, often with a counter-terrorism consideration.

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