

Message from the Director



Celebrating 30 Years of the National Institute of Forensic Science

For 30 years, NIFS with the support of our key stakeholders has delivered a targeted work program to address the critical issues facing the forensic sciences community. Our unique overview of the national and international landscapes and cross-jurisdictional position has enabled NIFS to drive improvements and innovation in the forensic sciences through projects such as Forensic Fundamentals, our Research and Innovation Roadmaps, and recent focus on Workflow and Capability mapping.

This newsletter contains a brief summary of some of the key achievements and milestones over the last 30 years. I would like to take this opportunity to thank the members of the Australia New Zealand Forensic Executive Committee (ANZFEC) for their ongoing support and investment in NIFS.

I would also like to thank and acknowledge the work and support of all the dedicated and driven NIFS staff who have contributed to the many great achievements and projects that have been delivered for the benefit of the Australia New Zealand forensic community.

Dean, Hannah and I were pleased to attend the recent ANZFSS Symposium

in Brisbane, where Donna and the Queensland team did a fantastic job given the uncertain environment at the start of the year (refer to page 21 for Donna's wrapup). There was fantastic representation from the forensic community nationally and internationally, with excellent plenary speakers, presentations and posters. Dean enjoyed the social activities, getting out of his Melbourne COVID bubble and mixing with his colleagues once again.

Big congratulations to Professor Linzi Wilson-Wilde OAM who was awarded the John Harber Phillips Award for 2022, recognising her outstanding contribution to the field of forensic sciences in Australia and New Zealand. The award was presented at the symposium dinner by Queensland Police Commissioner Katarina Carroll.

PC22

Following on from ANZFSS, ANZPAA hosted the first in-person conference in three years, again with fantastic representation nationally and internationally, including all ANZPAA Commissioners. The conference focused on the theme navigating the next generation of policing, with NIFS members assisting with the delivery of a number of sessions. We were lucky enough to have Dr Joannah Lee (NTPFES) and A/Superintendent Duncan McCarthy (QPS) present from their jurisdictional perspective on how forensics is adapting to the changing policing operating environment. Many of the presentations and panel sessions focused on the importance of partnerships, and the application of technology (AI) to emerging issues.

Welcome and Farewells

I would like to acknowledge the work of Ellen Konza from New South Wales Police Force who recently completed a 12-month secondment at ANZPAA NIFS. Ellen successfully managed the activities associated with delivering the Australasian Forensic Science Assessment Body (AFSAB) program and helped the team deliver a range of work program items.

I would like to welcome Lecinda Collins-Brown and Amy Sutton to the team. Both Lecinda and Amy have joined ANZPAA NIFS on 12-month secondments from

ChemCentre in WA and ACT Government and Analytical Laboratory, respectively. They will be working on Forensic Fundamentals and Workflow Mapping projects and are assets to our small team.

As 2022 draws to a close and travel resumes after a challenging few years with COVID-19, we are looking forward to resuming our face-to-face meetings with our stakeholders and members of the ANZPAA NIFS Specialist Advisory Groups in 2023.

On behalf of ANZPAA NIFS, I would like to wish you all a wonderful festive season. The team and I look forward to working with all of our stakeholders in 2023.



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ANZPAA
Australia New Zealand
Policing Advisory Agency



The Forensic Exhibit.

NIFS Update

Welcome

Please join us in welcoming new members to the ANZPAA NIFS Team – Lecinda Collins-Brown and Amy Sutton.



Lecinda joined us in July coming from her substantive role at the ChemCentre in WA where she leads the Illicit Drug Analysis team and recently led a

critical business improvement project, successfully eliminating casework backlogs.



Amy has recently joined us from ACT Government Analytical Services where she was Assistant Director overseeing the day-to-day operations

of the forensic chemistry unit. She is an experienced drug chemist and was recently involved as a technical expert in ACT Police, AFP and ACT Health working groups related to Drug amendment legislation, pill testing trials and the de-criminalisation of certain drugs.

Both Lecinda and Amy will assist in managing ANZPAA NIFS projects across 2022/2023 including Forensic Fundamentals and Workflow Mapping projects and will also be managing several specialist advisory groups.

Research and Innovation Roadmap

The purpose of the ANZPAA NIFS Research and Innovation Roadmap 2020-2025 is to promote the investment of funding and resources in research that is operationally relevant and of vital importance to forensic science service provision in Australia and New Zealand. ANZPAA NIFS developed the Roadmap through extensive engagement with the forensic community. It defines research areas that are important to strengthening current forensic science processes and building future capability. The figure below summarises the Roadmap research areas aligned to the ANZPAA Strategic Priorities.

Promoting Research in Forensic Science

ANZPAA Strategic Priority		Research Area	
Address Risk	→	Forensic Fundamentals	Strengthening underpinning science
		Human Factors	Improving objectivity & practice
Enhancing Practice	→	Data Sets	Developing activity level reporting
		New Tools	Automating processes & creating new capabilities
Shaping Stronger Connections	→	Forensic Intelligence	Using forensic data for broader purposes

You can find more information on the Roadmap via the following link:

<https://www.anzpaa.org.au/forensic-science/our-work/projects/research-and-innovation-project>.

Season's Greetings

The team at ANZPAA NIFS wish you a wonderful festive season. Thank you for your support in 2022 and we look forward to working with you in the new year.



The office will be closed from Midday Friday 23rd December 2022 and will reopen Tuesday 3rd January 2023.

The Forensic Exhibit. Celebrating 30 Years of NIFS



The National Institute of Forensic Science



The National Institute of Forensic Science Australia (NIFS) was established in 1992 as a National Common Police Service, providing support to the whole forensic science community. Over the coming years, NIFS formed a strategic partnership with the Senior Managers of Australia New Zealand Forensic Laboratories (SMANZFL), with a key focus on facilitating and supporting the work of the Specialist Advisory Groups that contained a range of forensic discipline subject matter experts.

Key Milestones and Projects

- 1974** Committee of Enquiry - National Forensic Institute established to investigate the need for a national forensic institute
- 1992** **Alistair Ross** appointed as inaugural Director (1992 to Aug 2003)
- 1994** Best Paper Awards established ([more information](#))
- 1995** The National Forensic Summit co-convened by NIFS
- 1996** After the Fact Crime Scene proficiency test launched ([more information](#))
- 2002** First Ian Riebeling New Practitioner Workshop delivered
- 2004** **Tony Raymond** appointed Director (Mar 2004 to Sep 2007)

pre
1992



2000



- 1993** Laboratory Accreditation Program - MOU signed with NATA and SMANZFL
- 1995** Crime Scene added to accreditation program
- mid-1990s** National Diploma programs developed
- 2000** Electronic Evidence SAG launches annual Signal Processing Proficiency Tests
- 2000** Development of the Fireball ballistics image capture, storage and retrieval system
- 2002** National Forensic Science Innovation Strategy



1 July 2008 NIFS was incorporated into the Australia New Zealand Policing Advisory Agency (ANZPAA) and became known as ANZPAA NIFS.

- 2008** Australasian Forensic Field Sciences Accreditation Board (AFFSAB) and the ANZPAA Disaster Victim Identification Committee (ADVIC) comes under the governance of NIFS
- 2008** **Alistair Ross** reappointed Director (Nov/Dec 2008 to July 2015)
- 2010** John Harber Phillips Award launched ([more information](#))
- 2011** After the Fact Crime Scene Proficiency Test transitioned to a web-based platform ([more information](#))
- 2012-2013** Finalisation of Australia Standard AS5388 Forensic Analysis series
- 2014** Independent Review of NIFS by The Honourable Frank Vincent AO, QC released ([more information](#))
- 2015** **Linzi Wilson-Wilde** appointed Director (Dec 2015 to Jan 2021)
- 2016** Implementation of New Operating Framework
- 2016** Australia New Zealand Forensic Executive Committee (ANZFEC) established to govern NIFS, and SMANZFL amalgamated into ANZFEC
- 2016** Forensic Science Summit held with SMANZFL to critically evaluate the preparedness of forensic science capability for a dynamic and complex future in 2030
- 2017** Modernisation of the Australasian Forensic Science Assessment Body (AFSAB) (formerly AFFSAB) and alignment to contemporary international standards ([more information](#))
- 2017-2020** ANZPAA NIFS Research and Innovation Roadmap and Strategy
- 2018** Commence development of international standards for forensic science

2008



2012



2014



2017



2020



- 2009** Australia Standards development project
- 2010** A review of contextual bias in forensic science and its potential legal implications
- 2011** The future of forensic science standards
- 2011** Standardisation of DNA interpretation
- 2012** Advancing DNA Analysis – forensic technology for the future
- 2012** End-to-end Forensic Identification Process - Volume Crime
- 2012** Proof-of-Concept Studies for a Field Based DNA Analysis System
- 2013** Predictive DNA Testing Project
- 2013** Guidelines for Digital Imaging Processes
- 2013** Interfaces project
- 2014** Australia & New Zealand Police Recommendations for CCTV Systems
- 2015** The Intelligent Use of Forensic Data
- 2015** A Guideline to Forensic Fundamentals - Identifying the Underpinning Science of Human Based Forensic Science Disciplines
- 2016** End-To-End Forensic Identification Process - Phase 2
- 2016** Current and Emerging Issues for Forensic Science Service Provision
- 2016** Rapid DNA Project - Phase 2
- 2017** An Introductory Guide to Evaluative Reporting
- 2017-current** Forensic Fundamentals Gap Analysis Projects
- 2018** Facial Identification - Considerations for capability development
- 2019** Empirical Study Design in Forensic Science - A Guideline to Forensic Fundamentals
- 2019** Double Blind System Testing Framework
- 2019** Case Record Review in Forensic Biology
- 2019** Transitioning Technology from the Laboratory to the Field – Process and Considerations for the Forensic Sciences
- 2019** A Multi-Disciplinary Approach to Crime Scene Management
- 2019** Application of the Parabon® Snapshot™ In Police Investigations
- 2020** Process Mapping Fingerprint Analysis
- 2020** Forensic Genetic Genealogy Analysis Project
- 2021** Workflow Mapping Drug Analysis
- 2021** Review of Education and Training products
- 2022** Forensic Capability Mapping - Firearm Examination
- 2022** Cross-Jurisdictional Familial DNA Searching for the Investigation of Crime in Australia

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Current Key Work Activities

ANZPAA NIFS Groups



We manage over 30 Groups to provide an essential mechanism to support and promote the continuous improvement of forensic disciplines, encouraging collaboration and innovative thinking.

Australasian Forensic Science Assessment Body (AFSAB)



AFSAB certification increases stakeholder confidence in the competency of Australian Fingerprint, Firearm and Crime Scene practitioners and enables interoperability between jurisdictions.

After the Fact Crime Scene Proficiency Test



This web-based virtual proficiency test tool developed by ANZPAA NIFS for the crime scene environment replaces the costly and time-consuming practice of creating mock crime scenes for the purpose of training and performance assessment.

Proficiency Test Program



We coordinate the annual procurement and distribution of over 400 proficiency tests from national and international suppliers, resulting in significant administrative savings for ANZPAA agencies.

Forensic Fundamentals



Commenced in 2016, the purpose of this project has been to assess the foundational validity of 20 forensic disciplines and to proactively identify areas for further research and empirical testing.

This project supports the continuous improvement of forensic sciences and its application in the criminal justice system.

Forensic Workflow Mapping



A multi-year project to review and compare the different jurisdictional workflows across a range of forensic disciplines to identify opportunities for process improvement, cost savings and reductions in turnaround times.

Fingerprint and Drug Analysis have been completed as part of this project, with the mapping of Forensic Biology underway.

Forensic Capability Mapping



A multi-year project to map capability across a range of forensic disciplines to determine emerging risks, conduct root cause analysis and recommend cross-jurisdictional initiatives to strengthen capability resilience into the future.

Firearm Examination was the pilot discipline for this project.

Forensic Fundamentals Project 2017-current

- A Guideline to Forensic Fundamentals – Identifying the Underpinning Science of Human Based Forensic Science Disciplines
- Empirical Study Design in Forensic Science – A Guideline to Forensic Fundamentals
- Forensic Fundamentals Gap Analysis
 - » 2017-04 PILOT Anthropology, Doc Examination, Shoemark and BPA
 - » 2019-08 Fingerprints, Ballistics and Explosives
 - » 2020-07 Gunshot Residue, BPA and Toxicology
 - » 2021-07 Drug, Toxicology and AV Analysis
 - » 2021-09 Anthropology, Textile Damage and Clan Lab
 - » 2022-07 Biological Screening & Sampling, DNA Profiling, Chemical Trace and Doc Examination

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Celebrating 30 Years of NIFS



The National Institute of Forensic Science 1992-2015



Associate Professor Alastair Ross AM

Inaugural NIFS Director

In February 1992, I walked into a metal demountable in the back corner of the Victoria Police Forensic Services Centre (VPFSC) campus in Macleod, Victoria. The demountable contained only a small reception desk and this was the humble beginnings of the National Institute of Forensic Science (NIFS). I was the inaugural director and at that point, the sole employee. I was soon joined by secretary, Mrs Ann Gidley and Ann provided loyal and valuable service to NIFS until her retirement in 2021.

NIFS began with four significant foundational advantages which were in no particular order:

- a supportive Board consisting of three police commissioners, three forensic laboratory directors and a very influential, encouraging and independent chair, The Hon John Harber Phillips, Chief Justice of Victoria
- the Senior Managers of Australian and New Zealand Forensic Laboratories (SMANZFL), now ANZFEC, who had begun to galvanise the forensic science community and were strong advocates for NIFS
- an understanding forensic science community with a collective will to ensure that NIFS succeeded
- an effective and forward-thinking panel of advisers consisting of senior forensic scientists and representatives of the legal community and academia

One aim was to continue to enhance the galvanisation initiative begun by SMANZFL through a small permanent staff such that the majority of NIFS budget, such as it was, was directly expended within the forensic science community.

Early programs included:

- provision of funding for the existing SMANZFL specialist advisory groups (SAGs) such that one person from each State/Territory was able to attend an annual meeting. This enabled significant standardisation within each of the disciplines represented by the various SAGs
- similar funding for an annual national workshop program (4-6 workshops per year) with the workshop topics nominated by the SAGs. Early on, this included funding to support the attendance of international experts when appropriate
- funding for joint academic/forensic practitioner research projects. Although the funding was modest it encouraged a fledgeling research culture. This was accompanied by a program of 'best paper' awards to encourage research partners to publish their findings in different forms of journals (e.g., peer reviewed) and magazines.
- development and delivery of national diploma training programs for crime scene examination, fingerprints and firearms analysis
- in conjunction with SMANZFL, the National Association of Testing Authorities (NATA) and the American Society of Crime Laboratory Directors' Laboratory Accreditation Board (ASCLD/LAB), development and delivery of a national forensic science laboratory accreditation program. It was the first program in the world to include crime scene examination which after all,

is where forensic science begins.

- funding for a national proficiency testing program as an encouragement for the different facilities to further engage in quality management
- funding for the Michael Duffy Travel Fellowship which enabled one or two practitioners each year to travel overseas and study their field, thereby enhancing their knowledge and, through a national report, the knowledge of their colleagues in Australia and New Zealand
- facilitation of the use of a common DNA profiling system, Australia-wide, to enable a national DNA database.

Time necessitates change and some of the initial programs, having served their purpose were dropped in favour of more contemporary initiatives identified by, or at least in consultation with, the forensic science community. It was vital for NIFS to remain small, nimble, responsive and, therefore, un-bureaucratic and it achieved this for much of the first 20 years of its existence.

The good will of the forensic science community was absolutely unstinting and NIFS gained an enviable international reputation.

Apart from five years absence 'for good behaviour' (2003-2008 as director of VPFSD) I was director of NIFS until semi-retirement in 2015. What a pleasure it was to work in such a professional, encouraging and supportive environment.

Under the subsequent and successful directorships of the late Dr Tony Raymond and Dr Linzi Wilson-Wilde the successes of NIFS have multiplied. The credit lies with these directors and the ongoing support of the forensic science community.



The Forensic Exhibit.

Celebrating 30 Years of NIFS



The National Institute of Forensic Science 2008-2021



Professor Linzi Wilson-Wilde OAM

NIFS Director 2015-2021

I remember receiving a phone call from Alastair Ross in September 2008. I was on extended leave completing the experimental work for my PhD and Ali rang to ask if I would be interested in joining him at NIFS. I remember thinking, what an amazing opportunity! Little did I know what a journey I would go on with NIFS and the whole forensic community.

The strength of NIFS is its relationships and connection to national and international forensic stakeholders. NIFS engages with the community at all levels:

- students through the Ian Riebeling New Practitioner Workshops
- junior scientists through its discipline workshop program and the Australasian Forensic Science Assessment Body program
- senior scientists and managers through the Specialist Advisory Groups and other expert groups
- laboratory directors through the Australia New Zealand Forensic Executive Committee (ANZFEC), and
- through ANZPAA to the Police Commissioners on the ANZPAA Board and even to the Ministers.

The ability of NIFS to make connections at these different levels enables it to identify broader issues and take the community on a journey to facilitate change. NIFS can take advantage of the multi-agency resource collective to deliver timely results that a single agency could not achieve independently.

I joined NIFS as it was transitioning into becoming part of ANZPAA. This did change the way NIFS operated and its accountability but gave NIFS access to higher levels of agency and jurisdictional governance that could assist in driving change. Over the last few years its achievements have included:

- introduction of a framework to assess the validity and reliability (Forensic Fundamentals) of forensic science disciplines and delivery of discipline reviews
- development and implementation of a framework, which includes the Research and Innovation Roadmap, to determine operationally relevant research needs in consultation with government service providers, academia, research agencies and end users
- modernization of AFSAB and alignment to contemporary international standards
- development of national standards (AS 5388 through Standards Australia) and international standards for forensic science (ISO 21043 through the International Organization for Standardization)
- international engagement, particularly

work with the International Forensic Strategic Alliance, and

- development and launch of the Engender Change project to promote diversity and inclusion in the forensic science community.

NIFS works because of the buy-in for the forensic community, in particular the NIFS Groups and ANZFEC members, and the willingness of the community to make NIFS a success. NIFS works because of its team, an amazing group of individuals that each bring their own skills and experience to NIFS and work hard to develop significant outcomes for the community. NIFS has been shaped over the years by its team and past Directors – first Prof Alastair Ross, as the inaugural NIFS Director and then Prof Tony Raymond, who both did an amazing job leading and developing the NIFS team and the forensic community, establishing NIFS as the peak cross jurisdictional forensic body.

As a previous director, I cannot express how much pleasure I received from watching forensic scientists come into NIFS, grow and develop by engaging on the national level, and then go on to achieve so much more. It was a pleasure and honour to work with and as a part of the NIFS team.



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NIFS in pictures



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NIFS Awards

John Harber Phillips Award 2022



Professor Linzi Wilson-Wilde OAM was awarded the John Harber Phillips Award for 2022.

The John Harber Phillips Award is the most prestigious honour given to an individual for their outstanding contribution to the field of forensic sciences in Australia and New Zealand. It recognises outstanding excellence in the forensic sciences field.

Linzi is an internationally renowned forensic scientist who has enhanced forensic capability and capacity across jurisdictions and has positioned Australia and New Zealand as global leaders in forensic sciences.

With a career spanning more than two decades, Linzi has achieved numerous accomplishments. She played an instrumental role in the development of seven Australian forensic science Standards. She then went on to chair three ISO International Standards, based on the excellent work previously undertaken by the Australian Standards committees.

Linzi has been involved in numerous projects across the breadth of her career that has improved the knowledge and practice across Australia and New Zealand forensic sciences. Her role leading the victim identification team after the 2002 Bali bombings led to her being honoured with the Medal in the Order of Australia and she was also inducted into the Victorian Honour Roll of Women in 2014.

Linzi initiated the ANZPAA NIFS Forensics Fundamentals Project. This project investigates the empirical evidence underpinning forensic science disciplines, enabling targeted research and improving the validity and reliability of forensic science evidence.

Linzi is highly regarded for her work overseas including advanced legislative reform and policy development where she advocates for forensic sciences globally. Her rigorous campaigning for diversity and inclusion in forensic science continues to inspire and improve culture.

Linzi is the President of the International Forensic Strategic Alliance, the Interpol Forensic Science Managers Symposium Committee and Vice-Chair of the International Criminal Court, Office of the Prosecutor Scientific Advisory Board. Through her position on these committees she provides leadership to enhance operational services for the benefit of the justice system and the communities they serve.

ANZPAA Chief Executive Officer, Dr Tracey Green congratulated Linzi on receiving the award, "Linzi has demonstrated incredible leadership over two decades. She has led new collaborations, pushed for continuous improvement, and helped to inspire the next generation of science leaders."

"As the first female recipient of the award, Linzi has been a strong and generous mentor across her career and has inspired

more women to be involved in STEM." Says Dr Green.

The Director of ANZPAA NIFS, Dr Grant Liddy, said the award is richly deserved. "Linzi exemplifies leadership and collaboration. She continues to advocate for collaborative research and increased support, operationally and financially, to expedite forensic sciences research and improve forensic capabilities. She is an exemplar of what the John Harber Phillips Award is about."

Linzi acknowledges that it was a great honour to receive the Award, "to be able to influence the development of forensic science and the people at a global level for the betterment of the science is very rewarding."

The John Harber Phillips Award and Medal was formally presented to Linzi on 15 September at the 25th International Symposium of the Australian and New Zealand Forensic Science Society (ANZFSS).

Congratulations Linzi.



▲ Commissioner Carroll presenting the John Harber Phillips Award to Professor Linzi Wilson-Wilde during the ANZFSS Symposium Dinner in Brisbane, September 2022.

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NIFS Awards

2022 Best Paper Award Winners



The ANZPAA NIFS Best Paper Awards are presented yearly and recognise the contribution of members of the Australian and New Zealand forensic science community in improving the forensic sciences, and increasing the body of knowledge available to the forensic and wider communities.

NIFS would like to congratulate the following winners:

WINNER: Best Paper - Forensic Fundamentals

Exploring likelihood ratios assigned for siblings of the true mixture contributor as an alternate contributor.

Hannah Kelly, Michael Coble, Maarten Kruijver, Richard Wivell and Jo-Anne Bright

<https://onlinelibrary.wiley.com/doi/10.1111/1556-4029.15020>

WINNER: Best Paper - Capability Enhancement and Innovation (Biology)

Using big data from probabilistic genotyping to solve crime.

Duncan Taylor and Damien Abarno

[https://www.fsigenetics.com/article/S1872-4973\(21\)00167-8/fulltext](https://www.fsigenetics.com/article/S1872-4973(21)00167-8/fulltext)

WINNER: Best Paper - Capability Enhancement and Innovation (Fingerprints)

Automated 'lights-out' searching of all recovered fingerprints: Review of the current workflow for latent fingerprint processing in Queensland, Australia.

Troy O'Malley, Matt Krosch, Paul Peacock, Rechelle Cook and David Neville

<https://www.sciencedirect.com/science/article/pii/S037907382200202X>

WINNER: Best Technical Article, Note or Case Study

Developmental validation of an efficient differential separation method incorporating the i-sep® DL spin column with high sperm DNA recovery for the processing of sexual assault samples.

Tammara White, Marie Rye and Jasmine Tay

<http://dx.doi.org/10.1111/1556-4029.15043>

WINNER: Best Literature Review (Biology/Intelligence)

Privacy implications of the new "omic" technologies in law enforcement.

Paul Roffey and Nathan Scudder

<https://doi.org/10.1002/wfs2.1445>

WINNER: Best Literature Review (Pathology)

The logic of forensic pathology opinion.

Hans de Boer, Judith Fronczek, Charles Berger and Marjan Sjerps

<https://link.springer.com/article/10.1007/s00414-021-02754-1>

WINNER: Best Literature Review (Quality Management)

Toward a common language for quality issues in forensic science.

Anna Heavey, Gavin Turbett, Max Houck and Simon Lewis

<https://doi.org/10.1002/wfs2.1452>

WINNER: Best New Publisher in a Refereed Journal

The alprazolam analogue 4'-chloro deschloroalprazolam identified in seized capsules.

Sheena-Ann Trigg, Jason Wells, Jasmine McGann, Soeren Bock, Adam Holman, Stephen Harrison, Ching Yong Goh, Stephen Moggach and David Brown

<https://doi.org/10.1002/dta.3325>

For more information about the awards please visit our website:

<https://www.anzpaa.org.au/forensic-science/our-work/awards/best-paper/best-paper-award>

The Forensic Exhibit.

News from the forensic community

International Organisation for Standardization (ISO) Technical Committee (TC) 272-Forensic Sciences



The International Organisation for Standardization (ISO) Technical Committee (TC) 272-Forensic Sciences began as a Project Committee in April 2013 and converted to a Technical Committee in 2015. TC272 meets twice per year and has 27 participating countries and 19 observing countries. TC272 has published three ISO standards specific to forensic science and there are a further three standards currently in development as follows:

- ISO/IEC 18385:2016 Minimizing the risk of human DNA contamination in products used to collect, store and analyze biological material for forensic purposes - Requirements (published)
- ISO/IEC 21043.1:2018 Forensic sciences - Part 1: Terms and definitions (published). Further terms and definitions are being developed for parts 3-5 which will be added to this standard.
- ISO/IEC 21043.2:2018 Forensic sciences - Part 2: Recognition, recording, collecting, transport and storage of items (published)
- ISO/CD 21043.3 Forensic Sciences - Analysis (in development)
- ISO/CD 21043.4 Forensic Sciences - Interpretation (in development)
- ISO/CD 21043.5 Forensic Sciences - Reporting (in development).

Ms Kylie Schumacher is the committee secretariat and Prof Linzi Wilson-Wilde is the Chair, both appointed by Standards Australia (SA). The Australian mirror committee to TC272 is SA CH041 - Forensic Analysis and Inspector David Neville, from Queensland Police is the CH041 Australian representative on TC272. CH041 has representatives from government agencies, academia and private agencies from around Australia. New Zealand has its own mirror committee and A/Prof SallyAnn Harbison MNZM is the NZ representative on TC272.

ISO TC272 last met in Denmark in October 2022 and will meet again around May 2023. The committee hopes to publish the final three standards in early 2024.

International Forensic Strategic Alliance (IFSA)



The International Forensic Strategic Alliance (IFSA) is a partnership between regional networks of forensic science providers including:

- Academia Iberoamericana de Criminalística y Estudios Forense (AICEF)
- The American Society of Crime Lab Directors (ASCLD)
- Asian Forensic Sciences Network (AFSN)
- European Network of Forensic Science Institutes (ENFSI)
- National Institute of Forensic Science Australia New Zealand (NIFS ANZ)
- South Africa Regional Forensic Science Network (SARFS)

and Strategic Partners including:

- Leverhulme Research Centre for Forensic Science (LRCFS)
- INTERPOL
- United Nations Office on Drugs and Crimes (UNODC).

These autonomous networks represent forensic science laboratory management for their specific regions. IFSA leverages international collaboration and cooperation on strategic issues to realise quality forensic services worldwide and works with strategic partners to achieve this purpose.

The Vision of IFSA is “*Collaboration in forensic science for a safer world*” and its Mission is “*To provide strategic leadership and create opportunities for collaboration across the global forensic science community*”.

Specifically, the goals and objectives of IFSA are to:

- develop strategies and activities that promote and enhance the use of quality forensic science

- encourage the exchange of forensic science information between the member networks and stakeholders
- promote the establishment and strengthening of regional forensic science networks
- collaborate strategically with other relevant international and regional organisations.

IFSA maintains a website at: <https://www.ifsa-forensics.org/> which publishes its work outputs and news items. To date IFSA members and its networks have developed three minimum requirements documents (MRDs) for emerging nations that have been published into six languages (soon to be seven). There are a number of MRDs in development. Importantly IFSA has developed a Research and Innovation Position Statement to provide leadership and promote research and innovation in areas with operational relevance that are critical to scientific service provision for the justice systems. The Position Statement has been used successfully to attract significant funding and resources to research at National, International and Global levels.

The Forensic Exhibit.

News from the forensic community

AFSAB Firearms Working Group – A review of the AFSAB Firearm Assessment

Matthew Bolton¹ and Sergeant Gerard Dutton²

¹ Australian Federal Police

² Tasmania Police

AFSAB certification is a formal process which ensures the competence and professionalism of forensic examiners in the Firearm, Fingerprint and Crime Scene disciplines. Forensic Firearm examiners have been qualified as AFSAB recognised experts for nearly two decades, which involves an extremely detailed course of study utilising the firearm National Training Curriculum (NTC). The study culminates in an intensive theory and practical assessment as well as a rigorous interview panel/moot court. When completed in its entirety, the certification process ensures confidence in the abilities and competence of firearm examiners employed in all the police agencies throughout Australia.

In 2021, NIFS commenced updates of the theory and practical components of the firearm assessment process, particularly in response to criticisms of the firearm discipline such as indicated in the NAS and PCAST reports. Other contemporary issues were included in the update such as bias mitigation, an understanding of the evaluative reporting format and the advances in comparative microscopy. An AFSAB Firearm Working Group, led by Ellen Konza, then Senior Project Officer at NIFS, was established with participants from the AFP, TASPOL, VICPOL and NSWPF.

As with many projects at that time, the Working Group had to be conducted online, with members meeting every fortnight to discuss the extensive updates required for the AFSAB assessment process, especially as completely new practical exercises needed to be developed. Additionally, a comprehensive update was required of all the current questions, with many new questions also needed for the written component of the assessment.

It was decided that a randomised approach was needed to generate questions that the candidates would face during the theory component of the assessment process. This meant that no two candidates from the same

jurisdiction would receive the same written test, as the examination would be drawn arbitrarily from the large pool of questions. The questions were divided into shorter style 1 or 2 points, longer 5 points and complex 10 point groups with the detailed questions requiring the candidate to be aware of several interrelated aspects from the firearm discipline. These detailed questions sought to simulate those issues which may be encountered at scenes or whilst undertaking microscopic casework and tested the student's ability to critically think through the requirements of any given scenario, again these were simulated from casework.

Each member of the Working Group was given a specific module from the NTC and tasked with developing a range of questions that would satisfy the number required for the larger pool, along with the number needed for each level of complexity, to meet the agreed scoring format. As these questions were created/modified and presented to the Working Group, interesting discussions ensued between the group's members with the aim of developing fair, yet challenging questions whilst also including the answers expected from the candidates.

In conjunction with the theory component, the Working Group also developed the practical phase of the assessment. This practical assessment involved creating a suitable number of Fired Bullets (FB) and Fired Cartridge Cases (FCC) and corresponding practical scenarios, which could be expected in casework. In order to validate the FB/FCC, a number of other qualified firearms experts, not involved in the Working Group, were asked to complete the practical component and report back to the group on the suitability of the FB/FCC for use in the assessments. As with the theoretical questions, a pool of FB/FCC were created, such that trainees, even within the same jurisdiction, cannot expect to see the same make-up of items that form the practical assessments. In short, the practical assessment is designed to test the candidate's ability to accurately attribute same or different source conclusions of a pool of 'Known' and 'Unknown' fired bullets and cartridge cases.

Shortly before Ellen's tenure at NIFS expired and her return to NSWPF, assessor instructions, candidate workbooks and the theory assessment were finalised, with all the updated and new questions added to the database, to be maintained by NIFS. At the time of writing, the practical assessment validation (confirming the suitability and quality of the items for examination) is being finalised, with assistance from the AFP, NSWPF and WAPF.

In recognition of Ellen's drive and determination to see this project completed in a relatively short time frame, Ellen was awarded an AFSAB certificate by the Working Group, in recognition of her newfound Honorary Firearms Expert status.



The members of the AFSAB Firearms Working Group were:

NIFS: Ellen Konza (project lead) and Vicki Muir

AFP: Matthew Bolton and Daniel Paine

TASPOL: Sergeant Gerard Dutton

VICPOL: Leading Senior Constable Darren Watson, Dr Kaye Ballantyne

NSWPF: Lucas van der Walt

The Forensic Exhibit.

News from the forensic community

ANZPAA Disaster Victim Identification Committee Exercise

Senior Sergeant Ritchie Callaghan

State DVI and Forensic Search Coordinator,
Forensic Services Group, Queensland Police
Service

The scenario. On 15 November 2022, an Australian Army Sikorsky UH-60 Black Hawk helicopter disappeared from radar on approach to Tarin Kot Airfield, Afghanistan. The weather was poor and there was low level cloud. The helicopter, with four passengers and one pilot on board, was on a security flight between Kandahar airfield and Tarin Kot, Afghanistan. On the loss of contact, search and rescue teams were deployed, with the helicopter wreckage being located shortly after.

This is the scene that confronted a multiagency training exercise during Exercise Zeus held at the Australian Facility for Taphonomic Experimental Research (AFTER), Sydney, NSW, between 20-25 November 2022.

The fourth Disaster Victim Identification (DVI) exercise held at AFTER was led and funded by the Australian Defence Force's Joint Military Police Unit (JMPU), testing the joint military and civilian command, control and coordination of a mass fatality event, with members participating from the JMPU and policing agencies.

Members worked in five teams of four members rotating through command roles, DVI scene activities, human remains handling, post-mortem activities and mortuary management to positively identify the deceased's fictitious alias.

Squadron Leader Ritchie Callaghan, the JMPU DVI advisor (and the State DVI and Forensic Search Coordinator in the Queensland Police Service), commented on the distinctiveness of the exercise. "We believe this exercise is unique around the globe. This facility allows our members to train in close to real world conditions ensuring members are prepared as well as possible" he said.

Field teams were confronted with remains in various states of decomposition, some buried under heavy rubble, with one deceased person being heavily fragmented when they were 'ejected' from the crashed helicopter. Scene and



Postmortem operations were supported by medical specialists including Pathologists, Odontologists and Anthropologists attending the exercise in their capacity as military reservists.

Field activities took place over three days during which teams worked together to locate and remove all deceased persons from the scene following INTERPOL DVI guidelines and ANZPAA DVI Committee (ADVIC) forms and processes.

A field mortuary was set up on site with noninvasive postmortem examinations occurring including the use of deployable handheld dental x-rays. Preliminary identifications were obtained using dental comparisons for all five deceased persons.

Lead researcher at AFTER, Dr Maiken Ueland commented on the exercise and value in bringing together different teams across respective areas. "This joint exercise is invaluable. It allows us to test research alongside the end users and give us a much better understanding of how the research can have a real life impact, while ensuring new tools and techniques are fit for purpose. This exercise is one of the best examples



how AFTER can be used to bring together researchers, industry and end users" she said.

Inspector Rod Anderson, the ADVIC Chair, also had the following to say. "Over a number of years ADVIC and jurisdictional police agencies have supported the ADF in developing their DVI capabilities. Exercise Zeus allowed the ADF to consolidate this development and take a leading role in planning and executing the exercise.

"The success of this relationship and skills gained by the ADF has increased Australia's preparedness to respond to an offshore DVI incident" said Inspector Anderson.

ANZPAA
Australia New Zealand
Policing Advisory Agency



The Forensic Exhibit.

News from the forensic community

The Creating Perceptual Experts Summit

**Chloe Smith¹, Dr Matthew Thompson¹,
Dr Rachel Searston² and Professor
Jason Tangen³**

¹ Murdoch University

² University of Adelaide

³ University of Queensland

Police, forensic organisations, and cognitive scientists are all interested in how to best train people to become experts in forensic fingerprint examination. At the Annual Creating Perceptual Experts Summit, fingerprint experts from Queensland, Victoria, NSW, and WA police agencies, as well as ANZPAA NIFS, collaborated with cognitive scientists from The University of Queensland, The University of Adelaide, and Murdoch University.

Researchers working on the Creating Perceptual Experts project shared their latest study results and gained valuable insight from fingerprint experts. Research studies investigated how specific elements of training impact on the development of perceptual ability, and whether there are individual differences that can predict

expertise in fingerprints. Implications of the research findings for personnel selection and training practices in the field were discussed. Representatives from police and forensic agencies shared operational and research updates from their respective organisations.

Several years of collaboration between researchers, police and forensic agencies on the Creating Perceptual Experts initiative has resulted in the creation of a training tool to aid in the development, maintenance, and enhancement of perceptual expertise in fingerprints. PrintGym, a web-based training environment that includes a variety of visual exercises that tap into different parts of fingerprint analysis, was presented at this year's summit.

PrintGym is built on scientific knowledge of competence, perceptual learning, and deliberate practise. The exercises provide examiners with exposure to many and varied instances of fingerprints. It allows examiners to exercise their visual abilities while also providing rapid, corrective

feedback. PrintGym is designed to augment existing training and professional practises.

Because PrintGym is nearing completion, summit attendees discussed:

1. how PrintGym could be used by trainers and trainees
2. how fingerprint experts at various career stages could use it
3. how it could be useful to other forensic departments, and
4. the potential for the training platform to be adapted to support perceptual expertise development in other forensic pattern-matching disciplines.



▲ Brooklyn Corbett from UQ presents research investigating whether fingerprint experts show a particular profile of general cognitive abilities and/or personality traits. Fingerprint experts tested so far performed above average on some standardised tests of visual ability; this knowledge could be used to help select and recruit individuals to become fingerprint experts.



▲ Lachlan Brown from UQ proposes a research study to investigate whether the level of variability in image sets used in training impacts on perceptual skill development. Theoretical predictions are that training on an image set with high variability will result in better perceptual skill than training on an image set with low variability. This knowledge can inform approaches to training and developing perceptual expertise.



▲ Dr Matthew Thompson describes the PrintGym tool. PrintGym is a science-based visual training tool intended to support training, development, and maintenance of perceptual expertise in fingerprints. PrintGym offers a range of fingerprint expertise training exercises with corrective feedback, a diverse pool of fingerprint images, and the capability to practice visual skills on fingerprints anywhere, anytime.

The Forensic Exhibit.

News from the forensic community

Validation of the Manchester Method for Craniofacial Reconstruction within an Australian context

Desiree Davis¹ and Associate Professor Jodie Ward^{1,2}

¹ Australian Federal Police

² University of Technology Sydney

In collaboration with the University of Technology Sydney (UTS) led Australian Facility for Taphonomic Experimental Research (AFTER), the Australian Federal Police (AFP) Facial Identification Team has developed their Craniofacial Reconstruction (CFR) capability to assist forensic investigations with unidentified human remains. A CFR is an estimation of a deceased individual's appearance in life from their skeletal remains (skull). The best-practice Manchester Method was selected, which relies on knowledge of facial anatomy and the relationships between the hard and soft tissue of the skull. CFRs are produced for cases where primary identifiers have been unable to determine the identity of the individual. On completion, the CFRs are disseminated to the public with the intention to reach those familiar with the individual and generate investigative leads. This technique is complemented by anthropological assessments and specialist DNA analysis which provide information on biographical and biological details.

To complete the validation, databases of facial features were collected from volunteer participants (UTS HREC ETH20-5443), using a laser-less 3D scanner. To preserve the volunteer's privacy, only one primary feature (eyes, nose or mouth) was extracted and the features de-identified. Skulls of AFTER donors, recovered from simulated casework conditions, were examined, photographed and scanned

using the same laser-less scanner to produce a 3D model (UTS HREC ETH18-2999).

A modification was made to the Manchester Method to remove any ancestry and sex specific elements as this technique was pioneered using archaeological remains. The Australian population is highly diverse, consisting of numerous mixed-ancestry individuals including ancestries wherein both sexes exhibit more robust skeletal structures than others. Instead, average tissue depths as determined by *Stephan and Simpson* (2008) have been utilised alongside known correlations between features and increased tissue depths. This removes any soft tissue bias towards sex and ancestry and intends to improve likeness by focusing on the individual's skeletal morphology.

A CFR was produced by firstly examining the 3D skull and photographs to estimate age-range, ancestry, sex and facial features. Average tissue depths were applied and facial muscles sculpted to provide the underlying structure of the face. Facial features were then selected from the database and tailored to the skull. The final model was then captured in frontal view, the skin painted and photo textures applied to produce a portrait. As certain features (i.e., hair) and lifestyle factors (i.e., build) are not visible from the skull alone, AFP CFRs are produced as a blended composite portrait exhibiting multiple factors. Additionally, the default portrait is produced in grayscale with external features blurred and shoulders removed. This ensures that the portrait does not inhibit recognition due to

cognitive bias or hyper-realism as shown in previous research. In cases where information regarding biographical or biological details is available through anthropological assessment, specialist DNA analysis or additional recovered items (i.e., clothing), an enhanced portrait is produced.

To minimise examiner bias and more closely simulate casework, the Forensic Artist producing the CFRs was not provided with any donor information, until the final 3D model was rendered. The self-declared donor details subsequently made available included hair colour, eye colour and ancestry, simulating the forensic DNA phenotyping results received in casework. This information was then applied to produce the portrait in colour.

Due to the uncontrolled capture conditions of donor imagery (i.e., non-frontal, distortion) a morphological analysis of individualising features, similar to Forensic Facial Image Comparison techniques, was selected as it is not reliant on measurements. Two independent examiners compared a list of characteristics derived from the *ASTM International Standard E3149-18 Standard Guide for Facial Image Comparison Feature List for Morphological Analysis*. The analysis showed sufficient similarities between both the CFR and donor image, particularly regarding observed asymmetries in the facial morphology.

The Facial Identification Team's CFR capability is featured as part of the AFP National DNA Program for Unidentified and Missing Persons which seeks to provide a coordinated, multidisciplinary approach to identification, providing answers to families affected by ambiguous loss.

The researchers would like to thank the volunteers who provided their facial features to establish the databases and, the AFTER donors and their families. Without their generosity, this validation would not have been possible.



▲ An example of the CFR process from 3D model to final rendered portrait. ©AFP

The Forensic Exhibit.

News from the forensic community

Australian Federal Police offers leading forensic anthropology and archaeology capability

**Terina Bruhn, Amy van Bilsen,
Jessica Bertrand-Bruce, Karina Craig
and Renee Wilson**

Australian Federal Police

The Forensic Anthropology and Archaeology (FAA) cohort comprises a group of multi-disciplined forensic scientists of the Australian Federal Police (AFP) within the Operational Science and Technology (OS&T) portfolio, based throughout AFP offices nationally. The inception of the FAA cohort followed the identification of a capability gap that could be addressed by leveraging off the existing knowledge and experience of OS&T members. The FAA cohort comprises of multi-disciplined scientists with various tertiary qualifications and/or experience in associated fields of anthropology and archaeology including forensic osteology, cranio-facial reconstruction, burial archaeology and crime scene investigation.

The FAA cohort comprises of two professional streams: Anthropology and Archaeology. Within each stream there are three authorisation levels; each level with specific training requirements, operational skill assessments and maintenance obligations in the form of competencies and proficiency tests. Due to the complimentary nature of the professional streams, members within the FAA often obtain authorisations in both disciplines. Field experience of the FAA cohort is developed by undertaking practical based archaeological training exercises, and assisting in examinations such as war



▲ An example Forensic Anthropology and Archaeology Cohort members and Coordinator Rachael Kennedy, excavation exercise 2022

crime investigations, Disaster Victim Identification (DVI), as well as undertaking a variety of scene work involving buried evidence and through observing/assisting Forensic Anthropologists with anthropological assessments. Striving to become law enforcement leaders in this area, FAA cohort members participate in continual professional development including anthropological short courses facilitated by industry experts, annual proficiency testing and representation on advisory bodies such as the Forensic Anthropological Technical Advisory Group (FA-TAG).

The FAA cohort now provides specialist assistance to a variety of investigations by offering the following services; human vs non-human origin determination; burial excavations and anthropological assessments (in consultation with anthropological experts where necessary). The FAA maintains a response capacity to assist state policing jurisdictions and international partners, when requested.

The Forensic Exhibit.

News from the forensic community

Protecting Australia by monitoring the illicit drug market in real time using portable near infrared technology (AFP)

Natasha Stojanovska¹, Harrison Fursman², Marie Morelato², Scott Chadwick², Claude Roux², Florentin Coppey³, and Pierre Esseiva³

¹ Australian Federal Police

² University of Technology Sydney

³ University of Lausanne

The AFP Innovation Fund complements the AFP's Ministerial Direction in promoting a high-performing, innovative and values-driven policing agency. As part of the AFP Innovation Fund 2022-23, the AFP have embarked on a research project in collaboration with the University of Technology Sydney (UTS) and the University of Lausanne (UNIL) into developing the MicroNIR technology and chemometrics modelling for Australian based seizure data initially focusing on methamphetamine seizures. The MicroNIR technology will also be utilised to evaluate cocaine and heroin specimens to check the validity of the models developed in Switzerland and their applicability in an Australian context. The original models were built in the European drug context which is different to the Australian drug landscape.

This research will support the frontline and enhance partnerships by developing a modern technique capable of qualitative, quantitative and geographically mapping seizure data. This technique has the potential to improve work health and safety of personnel, and bring a nationally consistent approach to modern frontline detection techniques in Australia across multiple jurisdictions in support of investigative and intelligence led policing. The technique has the potential to be expanded and include other substances including steroids and explosives.

The added value of the methodology is summarized in Figure 1. In short, the MicroNIR acquires the NIR signal in a few seconds and the spectrum is directly sent to a client application (run on mobile phone or a tablet). The client application then sends the spectrum to a dedicated server in order to be processed with chemometrics models that generate a prediction of the nature of the product analysed (i.e methamphetamine) and its purity. This information is then sent back to the client application in quasi real-time.



▲ Figure 1: NIRLab infrastructure¹

In addition, the results are characterized by geolocation, date and time of acquisition (provided by the client application, i.e., the mobile phone), type of illicit drugs and quantification. Therefore, this information can be automatically and instantly visualised on a map in order to detect new trends (e.g., the appearance of a new product in a specific area or to detect an increase in the purity of methamphetamine seizures) as an intelligence tool to guide investigations and the broader security context.

Spectra collected across a variety of seizures will be used for chemometrics models, which will statistically assess the similarity between different seizures in order to identify qualitative and quantitative information. Similarly, the qualitative and quantitative information obtained from the NIR spectra analysis will also be compared to regular laboratory methods employed by the AFP (Gas chromatograph – mass spectrometry; GC-MS) to evaluate the performance and accuracy of the chemometric models. Further validation will be provided by the analysis of blind samples.

Pending successful completion of these trials and building of the models, the AFP should be in a position to roll out this technique for a nationally consistent approach to frontline drug detection to compliment other well established detection tools. It is hoped that this technique will deliver real-time detection and purity information for seizures within seconds, a significant capability gain in forensics within the AFP.

References

1. Coppey F., et al. (2020), Providing illicit drugs results in five seconds using ultra-portable NIR technology: An opportunity for forensic laboratories to cope with the trend toward the decentralization of forensic capabilities, *Forensic Science International*, 317, 110498.

The Forensic Exhibit.

News from the forensic community

New, Rapid GCMS Addition to the NZ Customs/ESR Border Screening Laboratory at Auckland Airport

Chrissy Black and Matthew Russell

Institute of Environmental Science and Research

New Zealand Customs (Customs) and The Institute of Environmental Science and Research (ESR) Ltd work together screening consignments entering New Zealand through the international mail stream at Auckland Airport. The Customs/ESR Screening Laboratory, "CESL," began as a Proceeds of Crime-funded project in 2014, to address the time-consuming and costly process of screening suspicious items seized at the border, along with the growing incidences of novel psychoactive substances (NPS). The success of this project has resulted in ESR maintaining its presence at the border with staff from ESR's Forensic Chemistry teams working alongside Customs for over eight years, ultimately assisting in the identification of thousands of illicit substances.

However, in addressing the threat of a global opioid crisis, the limitations in detection capability, regarding the equipment deployed at the border, was assessed. The equipment mostly comprised point-of-care (POC) Raman-based devices and FTIR. Along with the associated false positives and negatives, this technology has struggled to sufficiently address mixture resolution and identify minor, potentially harmful, components.

The maturation of the border workflow has coincided with equipment libraries being updated and a reduction in the number of NPS occurrences, following the overall global trend. The change in submissions have challenged the laboratory's relevance by inadvertently reducing the value of the information being provided. Instead of identifying potential new NPS, the laboratory is frequently given the more difficult task of identifying concealments and minor components in all manner of matrices. As a result, the CESL laboratory was establishing the content of only 24% of samples (down from 42% in 2015) with the rest being returned as either 'negative' or 'unknown'.

A project to research new equipment coincided with Agilent's press release on its new QuickProbe™ for GCMS

(QP-GCMS). The application of chromatography to rapidly resolve drug mixtures was intriguing and the QP-GCMS was considered as a potential solution with the overall benefits being:

- Ability to rapidly analyse and potentially identify the presence of drugs in complex mixtures including paper tabs, tablets, vape liquids, plant materials, cosmetics, beverages, and foodstuffs.
- Minimal sample preparation – use of a probe to take a sample.
- More confidence in the identification of minor components and dangerous drugs in mixtures, that frequently by-pass screening e.g., fentanyl.
- Improved sample throughput and productivity – reduced sample preparation and quicker results (a few minutes compared to >30 minutes using conventional GCMS methods).

On this basis, a demo-mode of the QP-GCMS was acquired, on loan from Agilent. The ESR-funded project involved the analysis of approximately 700 samples, obtained from border intercepts, that were either mixtures of unidentified components or drug types that often produce weak or spurious results. Many of these included organic, plant-based materials, cosmetics, oils, aqueous liquids, gels, paper tabs and tablets. Upon identification of a drug component, using conventional GCMS procedures, the sample was subsequently analysed by QP-GCMS which, on virtually every occasion, re-confirmed the drug's presence. From this project, it was predicted that QP-GCMS would increase border detection capability by 15%.



▲ The Agilent QuickProbe GCMS in action at the Customs/ESR Screening Laboratory at Auckland Airport.

Since being implemented, the QP-GCMS has been working as predicted, identifying drugs that were "missed", using POC devices, including synthetic cannabinoids, tryptamines, steroids, the components of vaping liquids and counterfeit pharmaceuticals. As well as identifying 'hidden' components, the QP-GCMS, with no less importance, helps to confirm the authenticity of licit consignments before their release. Below is a list of the drugs the QP has identified during the first 6 months of operation.

DRUG	FREQUENCY	DRUG	FREQUENCY
2CB	1	Metandienone	1
4F-MPH	1	Metenolone	1
Amethocaine (tetracaine)	2	Methamphetamine	15
Amphetamine	2	Methasterone	1
Amynin	1	Methyl salicylate	2
Bromazepam	2	Metoprolol	1
CBD	1	Miltargyline	1
Chloromethathione (CMC)	2	MMMP	1
Cocaine	1	MPPP	1
Codeine	3	Nandrolone	1
Cyproheptadine	1	Nicotine (tobacco)	5
Dimethylpentylone	2	O-PCE	1
DMT	2	Opium	2
Eugenol	4	Oxandrolone	3
Flubromazepam	1	Oxymetholone	2
Flumazenil	2	P2P	1
Flunitrazepam	1	Pseudoephedrine	1
Heroin	1	Psilocine	1
Ibogaine	4	Pyrazolam	1
Ketamine	3	Sibutramine	2
MDMA	6	Stanozolol	3
Melatonin	1	Tamoxifen	3
Mestanolone	1	Testosterone	2
Mesterolone	4	Viaburnine	1

In summary, the QP-GCMS has been successfully integrated into the border workflow, screening seizures that have not been identified using POC devices. In the months since operation began in June 2022, approximately 650 samples have been analysed with an additional 48 compounds in 102 samples identified (approximately 15%).

The Forensic Exhibit.

News from the forensic community

Exploring efficiency gains in saliva screening

Dr Felicia Bardan

Laboratory/Research Scientist, Forensic Science SA

Crime scene exhibits are frequently screened for the presence of saliva at Forensic Science SA (FSSA), including swabs, bedding, masks or balaclavas, and clothing. One method employed at FSSA is the immunochromatographic Rapid Stain Identification™ – Saliva (RSID™-Saliva) test from Independent Forensics, specific for human α -amylase.

Independent Forensics' original protocol recommended a sample extraction time of one to two hours. Our laboratory validated and had used an extraction time of one hour to conduct the RSID™-Saliva test. This extraction time created delays in the submission of samples for DNA analysis in urgent or priority work. However in 2016, an updated technical information sheet from Independent Forensics reported that an extraction time between 10 seconds and one minute, with agitation, produced comparable results to a one hour extraction for cotton swabs. This study did not test other substrate types.

In 2021, the Forensic Science SA Research and Development Committee, in accordance with the NH&MRC National Statement of Ethical Conduct in Human Research¹, approved a study to verify whether an extraction time of one minute, with agitation, gave equivalent performance of the RSID™-Saliva test in comparison to a one hour extraction protocol, on a range of substrate types and saliva dilutions². This was intended to create a more efficient workflow for saliva screening in our Evidence Recovery laboratory, and allow for the faster return of results to stakeholders in urgent or priority work. This work has been recently published in the *Australian Journal of Forensic Sciences*: <https://doi.org/10.1080/00450618.2022.2127894>.

We obtained saliva samples from consenting donors and prepared them to a range of dilutions before depositing them on various substrate types (viscose swab, cotton, fleece denim, acrylic, cotton polyester, bamboo and nylon). Five replicates of each dilution/substrate



▲ Laboratory Scientist performing an RSID-Saliva test using a one minute extraction time.

combination were subjected to RSID™-Saliva testing according to our standard protocol (sample extraction for one hour), and for one minute with agitation via a vortex.

Statistical analyses showed no significant difference in the time it took for a positive band to develop between the one minute and one hour extraction times across all substrate and saliva dilution combinations. We also did not observe any difference in the category of result (positive or negative). This demonstrated that reducing the extraction time from one hour to one minute had no detrimental effect on the sensitivity and reliability of the RSID™-Saliva test. However, the time taken to observe a positive result was dependent upon both the substrate type and the concentration of saliva, which is not unexpected.

The one minute extraction time has since been implemented by us into operational casework and has provided valuable efficiency gains in our workflow by reducing the turn-around time for saliva screening and subsequent DNA analysis on case exhibits. The effect of a reduced sample extraction time on the reactivity of the RSID™-Saliva test to body fluids and substances other than saliva should be (and are in the process of being) investigated. It would also be beneficial to explore a reduction in sample extraction time for other immunological tests used in our laboratory, in our quest to enhance efficiency in our workflows for faster turn-around times to our stakeholders and the community.

Further Reading:

1. The National Health and Medical Research Council, Australian Research Council, Universities Australia. National Statement of Ethical Conduct in Human Research 2007 (Updated in 2018). 2018. Canberra, Australia: National Health and Medical Research Council; Available from: www.nhmrc.gov.au/guidelines/publications/e72.
2. Bardan F., Pham-Nguyen V., Absolom J., Bellis M., Mitchell N., Henry J. 2022. Verification of a reduced sample extraction time for the RSID™-Saliva test. *Aust J Forensic Sci.*, (<https://doi.org/10.1080/00450618.2022.2127894>)

The Forensic Exhibit.

News from the forensic community

Evaluative Reporting Systems Using Bayesian Networks for Biological Fluid Identification

Angela Stroud¹, Stephanie Opperman² and Sally-Ann Harbison²

¹ University of Auckland

² Institute of Environmental Science and Research

The identification of biological fluids in forensic casework samples is a key requirement that often relies on chemical and biological tests. Most of these are presumptive in nature and exhibit some degree of false positivity. However, in reviewing the literature, it became apparent that there was a notable lack of research into cross reactions of biological fluids in stains commonly found at crime scenes. The Institute of Environmental Science and Research (ESR) in conjunction with Angela Stroud, an MSc student from the University of Auckland, set out to address some of these gaps in the pre-existing literature, which would then allow the data to be reliably used in the construction of Bayesian Networks for the identification of the most likely biological source.

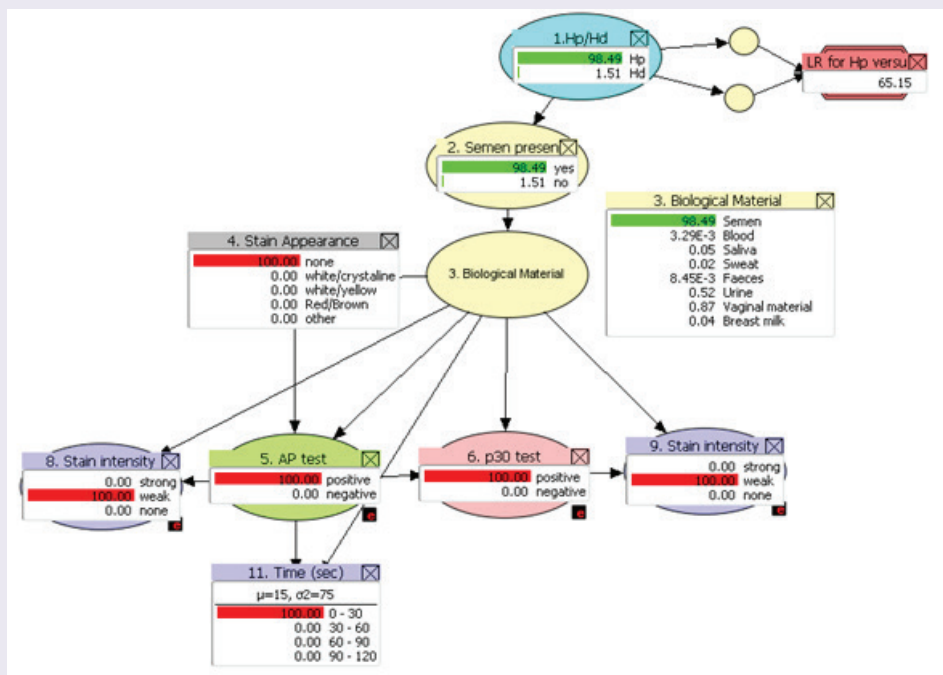
Our research focused on blood, semen, and saliva as possible sources of the analysed stains. Currently, forensic scientists rely on describing results using words such as probable, possible, and likely without always being able to provide robust statistical support for these conclusions. In this research we developed multiple Bayesian Networks to assist in creating an evaluative reporting framework that can address most instances, questions related to blood, semen, and saliva at the source level.

Additionally, a study screening underwear from a number of individuals was included, to substantiate the belief that vaginal material present in female underwear can give false positive reactions for saliva presumptive tests. This claim was validated through the data we collected, but by informing the saliva Bayesian network with data we obtained, promising results for distinguishing between saliva and vaginal material were found.

This research has shown how the use of Bayesian Networks can properly weight results with the separate factors such as appearance, strength, and time of reaction involved in biological fluid identification to provide support for sources other than the target.

Although it is likely that most cases where an opinion is sought for the source of the biological sample will likely benefit from an activity level evaluation, we are of the opinion that the source level networks we have constructed can also be useful. We envisage them being used to assist in the cases where previously the presumptive testing data would only allow for the sample to be described as 'probable' or 'possible'. We also believe the Bayesian networks we have constructed to assist with source level propositions can be incorporated into future Bayesian networks constructed to assist with activity level propositions, along with DNA results and Transfer, Persistence, Prevalence and Recovery (TPPR) data.

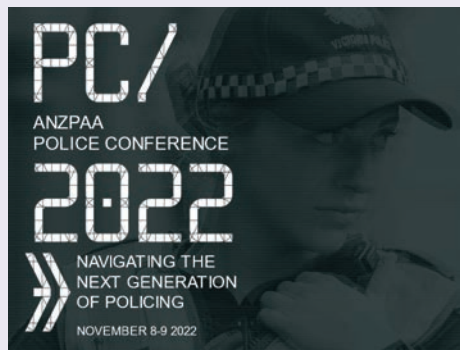
We are currently in the process of submitting the results of our research for publication to enable other laboratories to use the data we have gathered. One paper focuses on filling the gaps in relation to how eight different biological samples (blood, semen, saliva, urine, sweat, faeces, vaginal material and breast milk) react when tested with some of the more commonly used presumptive tests for blood, semen and saliva. We will also review the false positive data for the presumptive tests used in our study. Further publications will address the use of the data in Bayesian networks and the results of the underwear study.



▲ Example showing one of the Source Level Bayesian Networks Constructed for Semen.

The Forensic Exhibit. Conferences

ANZPAA National Police Conference 2022



Having successfully presented the Australia New Zealand Policing Advisory Agency's (ANZPAA) first in-person conference in three years, Police Commissioners from across Australia and New Zealand are reflecting on the importance of being together in-person once again to address common policing challenges.

The two-day event brought together more than 500 delegates from eighteen countries across policing, government, academia and industry. For the first time, delegates were also able to join the ANZPAA Police Conference (PC22) online, allowing inclusive access to the program for those who were unable to travel.

The thought-provoking topical sessions were focused on the theme navigating the next generation of policing.

PC22 included global experts on recruitment, future technologies, organised crime, police health and wellbeing, resilience and change and policing in the Indo-Pacific.

A highlight of the conference was the keynote address from Jürgen Stock, Secretary General of INTERPOL on the power of a global platform and the value in sharing intelligence across regions to boost police capacity and technical capabilities.

Speaking at PC22, Secretary General Stock shared some of the initiatives INTERPOL have deployed in Australia and New Zealand, noting that the "advantage of these operations is the permanent benefit they build among police officers."

PC22 dealt largely with emerging technologies and both the challenges and opportunities they present for law enforcement.

Speakers from academia, industry, policing and ANZPAA grappled with such themes as future workforces, digitisation of policing, the metaverse, and artificial intelligence.

Speakers included ANZFEC members, Dr Joannah Lee (NTPFES) and A/Superintendent Duncan McCarthy (QPS), who presented on how forensics is

adapting to the changing policing operating environment.

ANZPAA Chief Executive Officer, Dr Tracey Green said she was pleased with event feedback. "The ANZPAA Police Conference couldn't happen without the support and co-operation of the Commissioners and their jurisdictions across Australia and New Zealand, who are committed to focusing on working together to navigate emerging challenges. The event has been a great success, in terms of support from delegates and sponsors."

"In addition to being adaptable and resilient, the police of the future need to focus on partnerships with industry, academia and other police jurisdictions to navigate new and emerging types of crime, particularly tech crime, and other types of criminal activity," said Dr Green.

The Australia New Zealand Policing Advisory Agency is the policy and research agency for policing. They provide strategic foresight, research and policy advice directly to Police Commissioners across Australia and New Zealand. To register your interest in next year's event, express your interest to events@anzpaa.org.au



The Forensic Exhibit. Conferences

ANZFSS Brisbane 2022 wrapup

Donna MacGregor

*Forensic Services Group, Queensland Police Service
Chair of Organising Committee for ANZFSS 2022*

Greetings from Brisbane. It has been a couple of months since ANZFSS 2022, and this edition is the perfect opportunity for the final wrap up of the symposium before the year concludes.

But before I do, I would like to thank ANZPAA NIFS for their continued support towards promoting opportunities for the policing and forensic communities to meet and stay updated about emerging issues, research highlights etc. The promotion of ANZFSS 2022 through *The Forensic Exhibit* is just one example of their commitment to keeping us all connected, and we have appreciated their ongoing support.

Now to ANZFSS 2022. After years of lockdowns, border closures and global uncertainty, we on the organising committee were not sure at the start of this year, that the 25th International ANZFSS Symposium would even go ahead. But the forensic community rallied and submitted abstracts, the discipline chairs and their subcommittees volunteered their time, the plenary speakers all agreed to participate, the sponsors and exhibitors got behind us and the Brisbane Hilton provided us the perfect venue. The result: a fabulous event that exceeded all expectations. The success of the event would not have been possible without the support of so many. So a large debt of gratitude goes out to all of you that supported the symposium in some way.

A special thanks must go to Renee, Priscilla, Kate and the rest of the Encanta team. They delivered ANZFSS 2018 in Perth and now ANZFSS 2022 (<https://encanta.com.au/>). We could not have done this without them.

A special thanks also goes out to Bruce and Denise Morcombe for opening the symposium talking about their 'lived experience' and their ongoing legacy to Daniel through their work on the Daniel Morcombe Foundation



(<https://danielmorcombe.com.au/>). The talk was moving and reminded us that our work is important and has significant effects on real people within the community.

The social events were well attended and hearing all the chatter at the Sunday night welcome drinks after four years apart made all our efforts worthwhile. The 80's themed 'Back to the Future' dress up night at the QLD Museum saw many creative costume efforts. Then the formal dinner at the Brisbane Town Hall closed the symposium. QLD Police Commissioner Katarina Carroll attended and presented the John Harber Phillips Award to Dr Linzi Wilson-Wilde OAM. Congratulations Linzi! We were honoured to be part of your award celebration, that recognised your significant contribution to our forensic community. And we thank Commissioner Carroll for supporting our event in her very busy schedule.

At the conclusion of the presentations, and after handing the baton over to Claude Roux and Jen Raymond for IAFS 2023, there was dancing – a lot of dancing! Did we break the 'Nutmash' record? And every ANZFSS symposium needs Stewart Walker and his violin. Stewart did not disappoint, joining the Red Tie band on stage for a couple of songs! Thanks Stewart.

Overall our final delegate number was 650 registrations including day and student registrations. There were 399 presentations in total across 15 discipline streams delivered in 57 sessions across 4 days. The presentation breakdown was 257 oral presentations (with four delivered virtually) and 142 posters. Congratulations to all the

poster and oral presentation award winners. A full list of the award winners is available on the ANZFSS website (<https://anzfss.org.au/>).

The professional photos taken by Yme Tulleners of Kirkland Photography during the symposium (photographer@kirklandphotography.com.au) are available until the end of 2022 via the dropbox account below: <https://www.dropbox.com/sh/vc6ihf2h5zuo-dek/AABdEDnXwUD-YeEU0eY1Q6qra?dl=0>

A full list of plenary speakers, discipline chairs, exhibitors, sponsors, organising committee members can be found on the ANZFSS 2022 website (<https://www.anzfss2022.com/>). For those that may still want a challenge coin and missed out, please contact me via email. There are a handful of these left.

Finally, on behalf of the ANZFSS 2022 organising committee, thank you for your support in 2022 and we wish you all the best for the festive season and the new year. We hope to see many of you again at IAFS 2023. Until then, stay safe and stay well.

www.anzfss2022.com

 www.facebook.com/ANZFSS2022/

 [@anzfss2022](https://twitter.com/anzfss2022)

 [@anzfss_2022](https://www.instagram.com/anzfss_2022)

The Forensic Exhibit. Conferences

ANZFSS Brisbane 2022 in images



The Forensic Exhibit. Conferences

IAFS 2023 - Submit your abstract now!

Distinguished Professor Claude Roux

President, International Association of Forensic Sciences, University of Technology Sydney

The countdown is on – IAFS 2023 is only one year away! We are entering a critical phase for the organisation that includes the call for abstracts, peer reviews, construction of the Scientific Program and an increase in promotion. Are you ready for the ride?

In 2022, there has been a growing wave of enthusiasm for in-person conferences. In June, the European Academy of Forensic Science (EAFS) meeting attracted over 1,200 delegates from 42 countries in Stockholm. On a local front, the Australian and Zealand Forensic Science Society (ANZFSS) symposium in Brisbane in September was also a resounding success, with some 700 delegates thrilled to meet, share information and knowledge, and network with each other. Along with many other meetings returning to an in-person format globally, IAFS 2023 will provide a unique opportunity to showcase Australian and New Zealand forensic sciences to the world whilst providing delegates with

fantastic networking experiences. Our objective is to ensure that IAFS 2023 is the focal point for anyone involved or interested in making the world safer and fairer with science and medicine.

The Organising Committee, in collaboration with the Advisory Committee, sponsors and stakeholders, are excited to work towards delivering a memorable event in Sydney, Australia, from 20-24 November 2023. The Scientific Program is being constructed with the support of 92 convenors across 22 disciplines, and we are very grateful for their efforts. The social program will showcase all Sydney has to offer – with fantastic food, wine and entertainment for our international and local guests. Stay tuned for more information very soon.

Do you want to be part of the ultimate Forensic Science Meeting? Abstract submission is now open until 8 February 2023. This includes a multitude of presentation formats including oral talks, digital posters and workshops. Don't miss out, start preparing your abstract today!

Save up to A\$200 on your registration before 14 December 2022 by taking advantage of our Super Early Bird rate – places are strictly limited. [Register now](#) before they sell out!

As usual, we thank all our sponsors, exhibitors, speakers, delegates, suppliers and the Australian Government for their unwavering support. The IAFS Meeting in Australia will be bigger and better than ever.

Our (in)famous koalas are back travelling and have already visited Sweden, Belgium, Switzerland, France, Korea and the USA. Please take a look back at their adventures [here](#). You may wish to contribute to their stories by sending a photo to iafs2023@arinex.com.au.



We look forward to welcoming you to IAFS 2023. In the meantime, please join our mailing list by visiting www.iafs2023.com.au and keep up with the latest news on Twitter and Facebook.

 www.facebook.com/IAFS2023/

 [@iafs2023](https://twitter.com/iafs2023)

For any queries, don't hesitate to get in touch with the IAFS 2023 Meeting Managers, Arinex, via www.iafs2023.com.au or email iafs2023@arinex.com.au.



The banner features the IAFS 2023 logo at the top, which includes a fingerprint icon and a kangaroo silhouette. Below the logo, the text 'CALL FOR ABSTRACTS NOW OPEN' is prominently displayed in white on a dark background. The background of the banner shows a night view of the Sydney Opera House and the Sydney Harbour Bridge. At the bottom, there are logos for ANZFSS (Australian & New Zealand Forensic Science Society) and UTS (University of Technology Sydney), along with the dates '20 - 24 November 2023', the website 'www.iafs2023.com.au', and the hashtag '#iafs2023'.

The Forensic Exhibit.

News from the forensic community

Australian Academy of Forensic Sciences (AAFS)



Australian Academy
of Forensic Sciences

Dr Yvonne Skinner

President, Australian Academy of Forensic Sciences

What is forensic science? This question arose recently when I was examining proposed research projects with a group of forensic scientists. Comments included: "That's about crime prevention—nothing to do with forensic science!" and "Statistical analysis of information gathered by a survey—that's not forensic science." Similar comments about projects looking at maltreatment of children, and education about drug use. The ANZPAA website gives the definition of 'forensic science' as the application of science to assist in the judicial process. Other definitions mention application of the forensic scientific process to civil law in cases such as identification of deceased or missing persons.

The Academy was founded in 1967 by a psychiatrist. AAFS is unique in bringing together members from the disciplines of law, medicine and science who have contributed to the development of forensic science. AAFS also promotes research by encouragement and by providing research scholarships.

The AAFS journal, *Australian Journal of Forensic Sciences* (AJFS) publishes six issues per year. The objects of AAFS include encouraging the study, improving the practice and advancing knowledge of the forensic sciences. At the time of its foundation and for years afterwards, issues addressed covered a wide range of interests across disciplines, examining moral and philosophical issues of the day.

Gradually over time the topics covered by our guest speakers and articles in AJFS have moved to include more bench science, with an emphasis on the scientific procedures with application to criminal investigation. This shift in emphasis has occurred in conjunction with the expansion

of laboratory bench science and use of DNA sequencing in criminal investigations. As the field expands, forensic scientists are working to improve standards so that investigations will not be compromised.

Forensic science does not work in isolation. Perhaps more than many branches of science, the discipline depends on a system that is dominated by law and involves other professions. AAFS has members from a number of professions. Topics covered in meetings and presentations include issues in forensic science, law and psychology.

If you are perplexed and wondering what is forensic science, or are interested in forensic science and in the system in which the discipline operates, you can find information on AAFS at our website: www.forensicacademy.com.au

If you are interested in nominating to become a member of the Academy, you are welcome to contact a member or enquire via the website.

With best wishes for the holiday season and a happy and successful year in 2023.

The Forensic Exhibit.

Events Calendar

2023

AUGUST

60th International Congress of Forensic Toxicologists

27 – 31 August 2023

Rome, Italy

► <http://www.tiaft2023.org>

NOVEMBER

Asia Pacific Coroners Society Conference

13 - 15 November 2023

Sydney, Australia

► <http://www.dccconferences.com.au/apcsc2023>
apcsc2023@dccconferences.com.au

IX International Conference on Novel Psychoactive Substances

November 2023

Abu Dhabi, UAE

► <http://www.novelpsychoactivesubstances.org>

NOVEMBER cont.

23rd Triennial Meeting of the International Association of Forensic Sciences (IAFS) in conjunction with the 26th Symposium of the Australian and New Zealand Forensic Science Society (ANZFSS)

20 - 24 November 2023

Sydney, Australia

► <http://iafs2023.com.au>

#IAFS2023

ANZPAA National Police Conference 2023 (PC23)

28 - 29 November 2023

Melbourne, Australia

► <http://www.anzpaa.org.au>

The Forensic Exhibit.

More information

Acknowledgement of Country

ANZPAA NIFS acknowledges Aboriginal and Torres Strait Islanders are Australia's first peoples and the traditional owners and custodians of the land on which we work. ANZPAA NIFS is committed to fulfilling the principles of New Zealand's founding document The Treaty of Waitangi (Te Tiriti o Waitangi). Central to the principles is a common understanding that all parties will relate and participate with each other in good faith with mutual respect, co-operation and trust.

The Forensic Exhibit is committed to fulfilling the intent of international treaties and human rights legislation applicable to the various jurisdictions in which we operate, our obligations to Aboriginal and Torres Strait Islander peoples, and the principles of the New Zealand (Aotearoa) Treaty of Waitangi (Te Tiriti o Waitangi).

Newsletter contributions

If you would like any further information on ANZPAA NIFS or would like to contribute to the next edition of *The Forensic Exhibit* please contact ANZPAA NIFS Secretariat: secretariat.nifs@anzpaa.org.au

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