NSW GOVERNMENT | Health Pathology

Research Activity Report 2020

for all of us

www.pathology.health.nsw.gov.au

NSW Health Pathology (NSWHP) recognises the rights of Aboriginal and Torres Strait Islander Peoples and other Consumers to be engaged in any processes, projects and activities that may impact them.

NSWHP also acknowledges that Aboriginal and Torres Strait Islander Peoples have the right to control and maintain their culture and heritage, and that means benefiting from research undertaken by, with and about them.

The Lowitja Institute, Australia's national institute for Aboriginal and Torres Strait Islander health research, has developed two guides in response to a growing need for resources in this area.

Supporting Indigenous Researchers: A practical guide for supervisors

A guide to help researchers and research supervisors who are working in Aboriginal and Torres Strait Islander settings.

Researching Indigenous Health: A practical guide for researchers

A guide including the history, context, values and change priorities of Indigenous health research in Australia and the planning and management of Indigenous health research projects.

Contents

The information and data contained in this report was accurate at the time of the reporting period (2020) but might not reflect more recent changes to our organisational structure and priorities since then.

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Tracey McCosker PSM
NSWHP Chief Executive

Maree Gleeson
NSWHP Board Member

Welcome

We are pleased to acknowledge the research efforts of our staff in this fourth Research Activity Report.

The NSWHP Research Activity Report for 2020 is a credit to the talents of our researchers and our research office.

For all researchers, undertaking research in 2020 was a challenge since they had to adjust to both the positive and negative impacts of COVID-19 on research activities. The newly enforced constraints forced them to adapt their research programs, and many clinical trials and public health programmes were cancelled or delayed as a result.

The expertise and agility with which NSWHP developed and adopted rapid testing technology, accommodated innovative reporting and contributed to the timely public health data analysis were all beneficial effects of COVID-19. Future research activity reports will undoubtedly reflect these accomplishments.

The NSWHP Board commenced a review of our research governance and strategy in 2020. The research office worked diligently to ensure that we have strong research governance, and in 2021, we were to commence the implemented governance standards throughout all of our research services. We started a research strategy consultation process to ensure the final plan will deliver synergy between research, clinical and scientific practice.

The research in-focus highlighted in this report indicates the depth of research activity across our clinical disciplines and forensic services. The increase in clinical trials, research programs and technology is reflected in the increased research funding and publications. We congratulate all staff and the students they support for ensuring NSWHP is actively involved in improving health care and protecting public safety.

We encourage you to keep participating in high-quality research. Congratulations to everyone who received a research award in 2020. Be proud of your achievements.

Home

Paul Dunn
Director, Finance and
Corporate Services

Sustainability

In our Strategic Plan, Towards 2025, NSWHP is committed to delivering future-focused infrastructure and strategic commissioning, and leading the implementation of eco-friendly, sustainable services and workplaces.

In line with our sustainability commitments, I'm proud to announce that our 2020 Research Activity Report has gone green.

This impressive report is specifically designed to be viewed online. Throughout its pages, you will find clickable links that will take you straight to the pages you wish to read about or direct you to even more great research achievements, articles and resources.

You can even click the 'home' button at the top of each page to return to the content page.

The health and safety of the people across our state go hand in hand with the health of our planet. Let's work together to create real and lasting change, for all of us.

for all of sustainable

for all of us

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Current research climate

The Australian government funded ~$1.56B towards research and development across the health sector in the 2020-21 financial year. This represents an 11% increase from the 2019-20 budget.

The **Medical Research Future Fund (MRFF)** saw a 47% increase in funding ($579M) and the relatively new **Intergenerational Health and Mental Health Study (IHMHS)** saw a 7-fold increase in funding ($20M). These increases were offset through a decrease in funding across 16 smaller programs (totalling $156M).

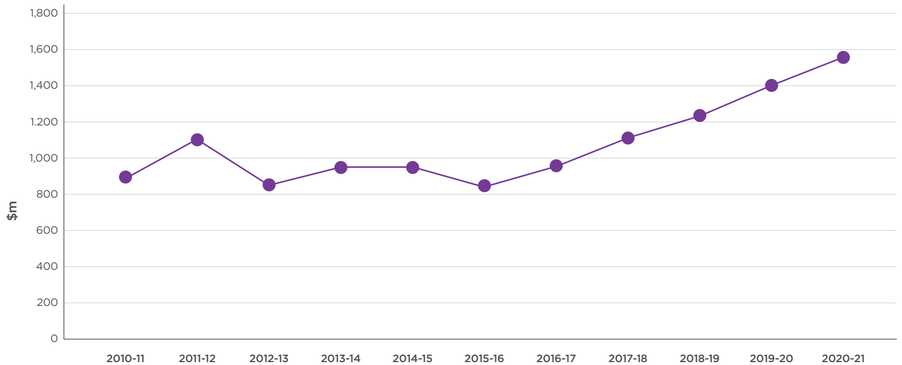
Including MRFF and the IHMHS study, the top 10 funded National research programs* are:

- **National Health and Medical Research** ($891M; 1%▼)
- Cancer Australia ($11.5M; ▲7%) under **Support for Cancer Clinical Trials** ($6.39M) and **Priority-driven Collaborative Cancer Research Scheme** ($5.1M)
- Australian Genomic Cancer Medicine Program ($10M; no change)
- **Drug and Alcohol Research** ($9.6M; ▼33%)
- **National Acoustic Laboratories** ($4.7M; ▼55%)
- **Health Policy Research & Data Program – Blood Borne Viruses and Sexually Transmitted Infections** ($4.38M; no change)
- **Lowitja Institute*** Research Funding ($4M; ▲160%) – Australia's national institute for Aboriginal and Torres Strait Islander health research

*Remaining 25 health programs total $23.6M

NSW GOVERNMENT Health Pathology

Australian Government investment in R&D in the Health Sector



There was also a further >$3.4M (16%▼) in funding towards the Australian Institute of Criminology. This included dedicated programs in the areas of serious and organised crime laboratory research, criminology research, and child exploitation research.

CSIRO also received $960M (15%▲) and Cooperative Research Centres received $234M (80%▲) under the 'industry, innovation and science' sector.

for all of us

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Research program achievements in 2020

Despite a year of the pandemic pausing a lot of research projects, we are proud to say that even in busy times NSWHP excels in research.

Read about some of the 2020 achievements from NSWHP researchers and research programs here;

- Developed and published the **NSWHP** Research Publication Authorship, Affiliation and Acknowledgements Policy
- Launched our first **statewide pricing model** for research
- Developed our first **Research Governance Framework**
- Streamlined our data management process
- Published our **Research Activity Report 2019**
- Established weekly Research Coordinators' huddle meetings to enable oversight of statewide projects to improve Research Services efficiency
- Two researchers successful in **round 2 of the Biospecimen Collection Grant**, through NSW Health Statewide Biobank, Dr Winny Varikatt and Associate Professor Ruta Gupta
- First **NSWHP Awards** saw the Research Excellence Award go to Geoffrey Kershaw, Senior Scientist, Royal Prince Alfred Hospital
- Our experts successfully grew the live coronavirus from several infected NSW patients and developed a serology test for COVID-19
- Research leaders with a pioneering vision, Dr Linda Hueston, Professor William Rawlinson, Professor Andrea Rita Horvath and Professor Vitali Sintchenko, received COVID-19 grants from the **NSW Government COVID-19 Research Grants program: Diagnostics**
- Became founding partner of the **Westmead Research Hub**
- Our medical entomologists, Dr Stephen Doggett and Dr Cameron Webb, were busy with media appearances due to La Niná and the impact on mosquitos
- Two Hargraves Innovator Award Winners – Amanda Phillips and Tom Karagiannis.

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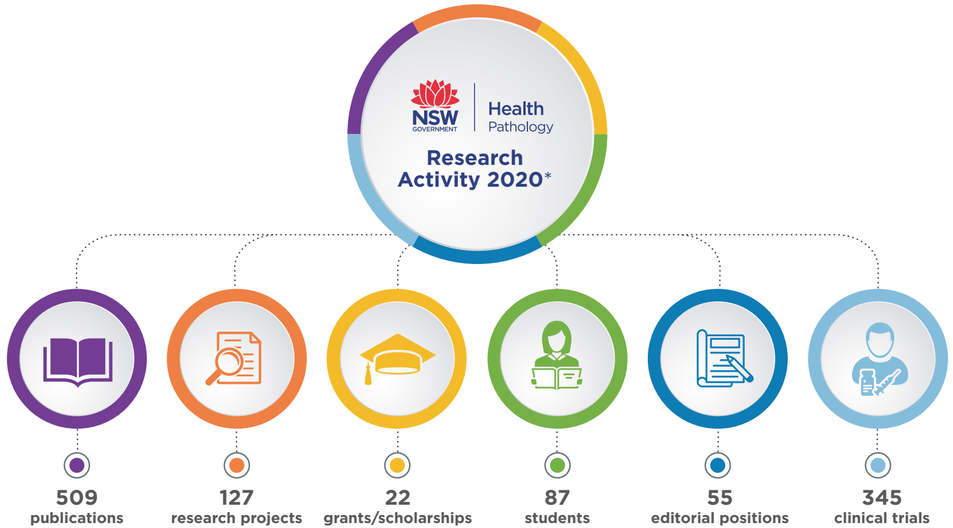

*Plus research not entered in the Research Activity Register.

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Publication overview

Translating research into a publication-worthy manuscript is a skill; one that many NSWHP staff have. In 2020, our staff registered 509 research publications in our Research Activity Register and many unregistered publications are likely to exist.

Publication types range from original peer-reviewed articles, non-peer-reviewed articles, review articles, editorials/commentary, book chapters and reports/guidelines.

Registered in our NSWHP Research Activity Register for 2020:

348 original peer-reviewed articles

49 original non-peer-reviewed articles

48 review articles

3 book chapters

31 reports/ guidelines

30 editorials/ commentary

The major contributors of publications from our clinical streams are:

- Anatomical Pathology
- Microbiology
- Haematology
- Chemistry

Well done!

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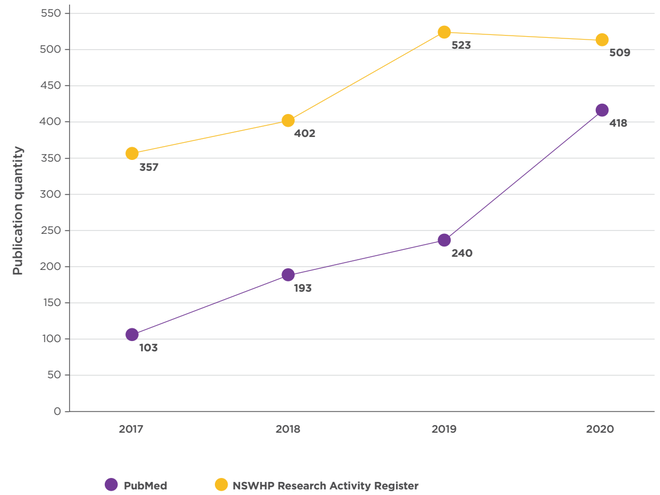
Publication impact

NSWHP's peer-reviewed publication impact has increased progressively since 2011.

This graph displays publication growth for NSWHP from 2017 to 2020 using data from PubMed (purple) through search terms like NSWHP, New South Wales Health Pathology, NSW Pathology and New South Wales Pathology, compared to data in our Research Activity Register.

To make your publication count, please read our Authorship, Affiliation and Acknowledgment Policy.



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NSWHP 2020 Research Excellence Award

Sponsored by **Charles Sturt University** to celebrate those who have the courage and conviction to pursue and break new ground.

In 2020, this award goes to **Geoffrey Kershaw**, Senior Scientist, Royal Prince Alfred Hospital for his work on haemophilia therapies.

In the past decade, new treatments have emerged that can improve the quality of life for patients with this serious bleeding disorder. Gene therapy is here, and extended half-life blood clotting factors can remain in patients' circulatory systems longer, reducing the need for injections from twice weekly to fortnightly. But such advances threaten to outpace traditional assays. New ways to measure and monitor novel therapies are needed for clinicians to treat and dose patients.

Geoffrey's research project: *Field studies with novel haemophilia products to help guide laboratories and clinicians treat patients with haemophilia*. For the first time, Australian labs are working together to study new treatments in the field and create new assays. Previously, assay measurements for new therapies were reported only in clinical trials. Already, our Camperdown lab has the distinction of being the first in Australia to validate the chromogenic FIX assay, which has proven to be more accurate in measuring some novel therapies.

The research is part of a PhD through The University of Sydney under the supervision of Professor Vivien Chen at The ANZAC Research Institute, Concord Hospital.

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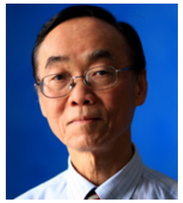
Intellectual Property (IP) and patents



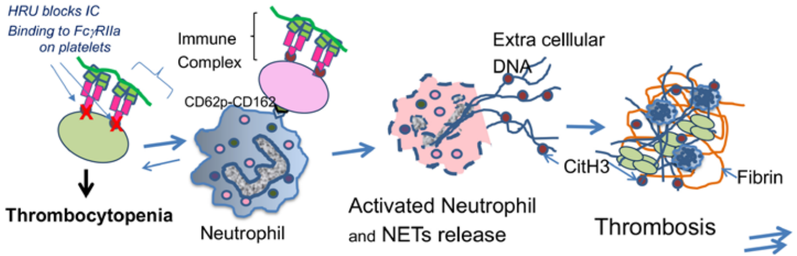
Professor Beng Chong

Invention Title:	Treating immune platelet disorders using antigen-binding fragments (WO 2020/191441 A1)
Inventors:	**Beng Hock Chong**, Halina Hoit Laam Leung and Jose Sail Perdomo

This international Patent Cooperation Treaty (PCT) between NSWHP and NewSouth Innovation Pty Ltd (UNSW) relates to an invention involving the treatment and prevention of thrombogenic related diseases and disorders.

It provides antigen-binding fragments that bind to either the FcRIIa receptor or platelet factor 4 (PF4) to prevent or treat heparin-induced thrombocytopenia (HIT), other immune thrombocytopenic and thrombotic disorders. Find out further information here.

Mechanisms whereby immune complexes induce thromocytopenia and thrombosis in Heparin-induced Thrombocytopenia (HIT) and other immune disorders.



Antigen binding fragment, HRU blocks inhibit platelet and neutrophil activation, NETosis and consequently alleviates thromocytopenia and suppresses thrombosis in heparin-induced thrombocytopenia and other immune thrombocytopenia and thrombosis.

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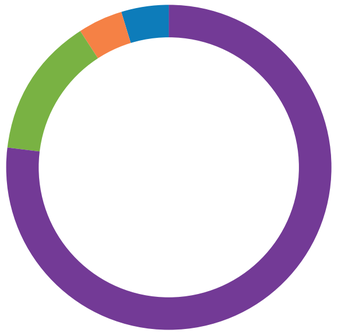
Grants

2020 saw 22 grants registered in our NSWHP Research Activity Register, totalling over $16.8 million.

Funding bodies included **Ramaciotti Medical Research Future Fund**, **MRFF**, **American Cancer Society**, IHMRI, **Rotary**, **RCPA**, **Cancer Institute NSW**, **NSW Health (OHMR)** and many more.

This level of achievement would not have been possible without the collaborative partnership between our NSWHP staff and peers in Local Health Districts, universities, research institutes and other external partners.



Proportion of funding type	Total Number	Percentage
Research grants	17	77%
Program grants	3	14%
Infrastructure grants	1	4.5%
Scholarships	1	4.5%

The proportion of funding types registered in the Research Activity Register.

Grants in focus

Dr Robert Rawson

Professor Richard A Scolyer

Grant title	**Predictors of response to neoadjuvant therapy in melanoma**
Investigators	Rodabe N; **Rawson R, Scolyer R**, Menzies A, Long GV from University of Texas MD Anderson Cancer Centre, University of Sydney, NSWHP, Melanoma Institute Australia
Funding body	Rising Tide Foundation for Clinical Cancer Research (RTFCCC) and the Melanoma Research Alliance (MRA)
Funding type	Research grant
Funding amount	$900,000.00
Funding Period	2020-2022

Study outcome and impact

Clinical stage III melanoma patients have poor outcomes when treated with upfront surgery and adjuvant therapy. Neoadjuvant, or pre-operative therapy, can potentially improve outcomes for these patients. Researchers at MD Anderson Cancer Center and the Melanoma Institute of Australia have recently reported that approximately 50% of clinical stage III melanoma patients with a fault in a gene called BRAF (BRAF V600) achieve complete melanoma death after exposure to neoadjuvant dabrafenib and trametinib (DT) treatment.

The proposed research aims to inform mechanisms of treatment response and resistance to targeted therapy and will enhance the field of neoadjuvant therapy, identify the risk of metastasis formation in the central nervous system and ultimately improve melanoma patient outcomes.

It is still early days for this research project but at the end of 2020, Dr Robert Rawson (NSWHP) and colleagues wrote an article related to this research, which has now been published. It shows that a special combination therapy called OpACIN-neo is consistent with other neoadjuvant immunotherapy trials in metastatic melanoma where any pathological response is an excellent predictor for prolonged relapse-free survival. While pathological and radiological responses correlate, in a significant number of cases there is a discordance between the two and our data support pathological assessment as the most robust primary endpoint for neoadjuvant trials. To read the full article, **go here**.

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Covid-19 grants in focus

NSW Health COVID-19 Research Grants were designed to fund research projects in priority areas to directly support the NSW Health response to the pandemic.

NSWHP was granted three of these grants.

SEROLOGY TESTING a scientific picture of virus' spread	PROTEIN MASS SPECTROMETRY just another day at the office	WHOLE GENOME SEQUENCING the missing link to connecting cases
RECIPIENTS		
Dr Linda Hueston	**Professor William Rawlinson**	**Professor Vitali Sintchenko**
PROJECT TITLE		
Development, evaluation and validation of ELISA assays for both the diagnosis of COVID-19 and utility in seroprevalence in communities	Improved confirmatory diagnosis of SARS-CoV-2 infection using protein mass spectrometry	Enhanced genomic tracking of COVID-19 importations and transmissions in NSW
PROJECT SUMMARY		
Received $389,411 to produce assays to improve the diagnosis and treatment of COVID-19 by using ELISA technology and a variety of COVID-19 specific antigens. If successful this will increase testing capacity, reduce turnaround times, reduce costs and improve diagnosis. This research will build on previous serology assay (IgG, IgA and IgM) detection and is a collaboration with Westmead Institute for Medical Research (WIMR).	Received $111,318 in funding to develop a new test to detect viral proteins in patient SARS-CoV-2 samples. The virus will be extracted from nasopharyngeal swabs and processed for analysis via liquid chromatography and mass spectrometry (LC-MS) to measure the viral proteins (to evaluate infection status). This work is being conducted in collaboration with external research partners, with the outcomes to complement current testing being performed in our laboratories.	Received $471,583 in funding to develop and implement whole genome sequencing methodologies that have higher sensitivity, capable of detecting COVID-19 in samples that have lower levels of viral load, supporting how NSW Health track, trace and stop COVID-19 transmission. This work will be conducted in collaboration with the University of Sydney.

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SEROLOGY TESTING a scientific picture of virus' spread	PROTEIN MASS SPECTROMETRY just another day at the office	WHOLE GENOME SEQUENCING the missing link to connecting cases
WHAT IS THE ISSUE FOR NSW?		
NSW needs to be able to diagnose and time infection, estimate prevalence in the population and assess vaccine effectiveness. To achieve these goals antibody tests specific for COVID-19 are critical. Immunofluorescent assays developed by Dr Hueston at NSWHP – Westmead ICPMR have met these goals but given the need to increase testing capacity, developing ELISA tests is the obvious next step.	A significant proportion of patients who have tested positive for SARS-CoV-2 infection using the current testing methodology continue to return positive results well after the typical window of infection has passed and symptoms have cleared, causing social and economic burdens. These patients and their families must isolate and cannot return to work. Continued re-testing of these patients places additional workload on the NSWHP virology department and reduces the capacity of the lab to test new specimens.	This research addresses a major and immediate challenge for genomic surveillance of SARS-CoV-2 in NSW and nationally – a low viral load in many diagnostic samples. It is extremely difficult to generate a full genome sequence from low viral load COVID-19 samples, which are increasingly collected from cases with minimal disease and asymptomatic infection. This in turn limits the tracking of transmission events and linking cases.
OUTCOMES		
Three IgG assays have been developed for Spike 1 IgG, Spike 2 IgG and Nucleoprotein IgG. Proof of concept is complete and currently, the cut-offs for the assays will be determined before validation is undertaken.	The project has achieved several positive outcomes to date: i) determination of the optimum specimen for testing ii) reduced throughput time (from 24 to 4 hours) on currently available methods iii) enhanced specificity and demonstration of this against potential confounding respiratory pathogens iv) enhanced sensitivity using optimised methods, and v) drafted these methods for distribution.	The research team have conducted the initial evaluations on in-vitro cultures of SARS-CoV-2, this important work has been implemented into the COVID-19 genomics workflow to increase sensitivity.

02

Student and supervisor in focus

Department of Anatomical Pathology, NSWHP Royal North Shore Hospital	
PhD student	Dr Talia Fuchs
Supervisors	Professor Anthony Gill
Project title	Investigation and implementation of clinically relevant prognostic biomarkers in human malignancies

Project outcome and impact

The discovery and validation of clinically relevant prognostic biomarkers is a central focus of current medical research that underpins much of modern oncology and personalised medicine. Talia's PhD project addresses the need for more accurate and individualised outcome prediction by exploring the prognostic significance of various histopathological prognostic markers in various malignancies. The project is broadly divided into four sections, each exploring one of the following prognostic biomarkers/tools: (1) tumour infiltrating lymphocytes in colorectal carcinoma, triple-negative breast carcinoma, and mesothelioma; (2) grading of medullary thyroid carcinoma; (3) grading of malignant pleural mesothelioma; and (4) development of a prognostic nomogram for colorectal carcinoma.

The results of these studies have been published in international peer-reviewed journals, with seven publications being included in Talia's PhD thesis, some of which have resulted in changes to routine surgical pathology practice. Talia has also contributed to various other research projects and textbook chapters during her candidature.

Dr Talia Fuchs

Student comment

Completing my PhD while working full-time as a registrar, and then as a newly appointed specialist Anatomical Pathologist has been a challenging but very rewarding experience. I have been extremely fortunate to have ready access to the vast biospecimen resources and established research pipelines provided by the Cancer Diagnosis and Pathology Research Group at the Kolling Institute. Working closely with my supervisor and various other clinical colleagues, both within the Department of Anatomical Pathology, and in other departments at Royal North Shore Hospital, has allowed me to simultaneously develop my skills in both translational cancer research and diagnostic surgical pathology. I have also had the opportunity to collaborate with colleagues from other institutions, both within Australia and on an international scale, including my recent participation in authoring the World Health Organization fifth edition classification of tumours, which will incorporate findings from some of my research projects.

Professor Anthony Gill

Supervisor comment

Docendo discimus is a Latin phrase that is usually translated as "by teaching, we learn". There is no doubt that, by supervising a PhD student as motivated and outstandingly successful as Dr Fuchs, not only have I learnt from her more than she has from me, but our whole research team has been motivated and invigorated. Talia has the clear potential to be a thought leader in surgical pathology and, even at this relatively early stage of her research career, her work has already been internationally recognised, and more importantly, adopted into practice in ways that meaningfully improve patient care.

02

Student and supervisors in focus

Department of Medical Entomology, CIDMLS, NSWHP Westmead-ICPMR

PhD student	Chutipong Sukkanon
Supervisors	Dr Stephen Doggett (Medical Entomology) and Prof Theeraphap Chareonviriyaphap (Kasetsart University, Thailand)
Project title	Topical and spatial repellent bioassays against the Australian paralysis tick, Ixodes holocyclus (Acari: Ixodidae)

Project outcome and impact

The Australian paralysis tick, Ixodes holocyclus, is one of the most common arthropods that bites humans along the eastern coast of Australia. In fact, it is the most frequent specimen submitted to our pathology service. As the name implies, the tick can cause paralysis, and in the past before the development of an effective antivenene, there were a number of deaths. However, allergic reactions are now the greater problem with this tick, and anaphylactic reactions are common in patients, with a number sadly succumbing to the effects of the bite. More recently, a condition known as 'Mammalian Meat Allergy' has been described, whereby some patients, after being bitten by the tick, develop an allergy to the consumption of mammalian meats and meat by-products. Already more than 1,000 sufferers of this condition have been diagnosed in the Sydney region alone. The tick also transmits the rickettsia, Queensland tick typhus, which has also proved fatal in untreated patients. In recent years, the Paralysis tick has also become more common due to fox control measures. This has allowed the population of the tick's host animals to grow in number. Despite the ill effects this tick causes, surprisingly there had been no research on tick bite prevention. Chutipong examined a range of topical and spatial repellents. The former is applied directly to the skin, while the latter works on a vapour action and are placed nearby to humans. Chutipong was only in the lab for three months, yet he managed to produce an excellent paper that was published in Australia's premier entomology journal, Austral Entomology, and he also wrote a much-read article for the global pest management periodical, the Federation of Asian & Oceania Pest Managers Association Magazine.

Home

Chutipong Sukkanon

Student comment

As a PhD student, a chance to work with one of the world experts is like a dream come true. My project in Thailand was the study of mosquito repellents, but while in Australia, I have managed to expand my knowledge on pest management, not only on bed bugs but also on mosquito surveillance and ticks, while working with Dr Stephen Doggett. We went into the field for tick collections, and of course, enjoyed the beautiful landscape of Sydney coast. I was able to apply my skill in repellent testing to our tick project and contributed to the identification of personal protection measures against the Australian Paralysis tick, and hopefully this will lead to reduced tick bite incidences. Thanks to my supervisors from Kasetsart University (Thailand) and NSWHP Westmead-ICPMR for allowing me to have a wonderful experience in Australia, sharing and creating this great collaboration.

Dr Stephen Doggett

Supervisor comment

I have been very privileged to have two wonderful students from Thailand who both undertook tick-related research in my laboratory. Not only were both extremely intelligent, but each had the most beautiful nature and I am proud to say our friendship and professional collaboration continues to this day. The first of the students was Chutipong Sukkanon, who I am pleased to say has completed his doctorate and now has a prestigious position at Walailak University (Thailand). The outcome of his research at our NSWHP Westmead-ICMPR Laboratory has directed policy on how best to avoid tick bites, through the use of the most appropriate repellents. Such work will play a crucial role in reducing human tick-related morbidities.

03

NSW GOVERNMENT Health Pathology

Our clinical streams and services

Clinical streams

Scott Jansson
Clinical Streams Coordinator

NSWHP has six **clinical streams**.

- Anatomical pathology
- Chemical pathology
- Haematology
- Immunology
- Microbiology
- Transfusion

The clinical streams were established to improve the quality, safety and efficiency of public pathology services, and promote collaboration among clinicians, scientists and other staff across pathology disciplines. They are charged with developing strategies that will improve the outcome and value for patients, clinicians, customers and stakeholders through the equitable, safe and efficient delivery of pathology services across NSW and to all patients.

They provide expert advice and undertake tasks to achieve NSWHP's strategic initiatives.

The purpose of our clinical streams is to:

- provide leadership in shaping the statewide direction for clinical services
- develop recommendations for innovative models of service delivery to patients and customers
- set best practice clinical standards and policy for services at a statewide level, and
- provide clinical advice on emerging issues and areas of risk to help ensure NSWHP provides high quality, safe clinical services to the NSW Health system.

> ***"The clinical streams actively support research in medical and scientific areas relevant to public pathology through their respective clinical disciplines."***
> ***Scott Jansson, Clinical Streams Coordinator***

Clinical services

Dr Stephen Braye
Chief Medical Information Officer, Director of Clinical Services

NSWHP has four statewide clinical services.

Point of Care Testing (PoCT)
NSWHP has the world's largest managed PoCT network delivering diagnostic services to NSW, with more than 680 devices and over 26,000 users.

Genomics
NSWHP has three streams consisting of pathogen genomics, cancer genomics, and rare disease genomics. We are developing a genomics cloud reporting framework through the Privacy and Security Accreditation Framework of eHealth NSW.

Public Health Pathology
NSWHP is actively participating in the establishment of the expanded pathogen genomics service. We are undertaking a comprehensive review of testing for notifiable diseases in the NSWHP laboratory network, identifying what, where and how testing is undertaken for organisms of public health significance.

Perinatal Postmortem Service
NSWHP provides compassionate and dignified care, consulting with relevant healthcare professionals to help families find the answers they need. We manage all non-coronial perinatal postmortem needs, providing timely, reliable results with expert examination using the highest ethical standards of care.

The clinical services were established to provide leadership, develop innovative models of care, set best practice and provide clinical advice. In some cases, the clinical services also provide operational oversight. They work closely with clinical streams, operations groups and local health district partners to develop effective services for patients and NSWHP clients.

The statewide clinical services also participate in service development and instrument design across national and international realms. They are exploring relationships with tertiary institutions for scientific research, higher degree opportunities, as well as engaging with ICT faculties to develop artificial intelligence in clinical systems.

04

NSW GOVERNMENT Health Pathology

Our research streams and services

Anatomical Pathology

deals with the tissue diagnosis of disease using a broad-based knowledge and understanding of the pathological and clinical aspects of many diseases (using tissue from living patients).

Chemical Pathology

encompasses detecting changes in a wide range of substances in blood and body fluids (electrolytes, enzymes, proteins, tumour markers, hormones, poisons and both therapeutic and illicit drugs).

Haematology

is a rapidly developing discipline which deals with many aspects of those diseases which affect the blood such as anaemia, leukemia, lymphoma, and clotting or bleeding disorders.

Immunology

involves both laboratory medicine (the testing of specimens collected from patients related to the immune system) and clinical practice (interviewing, examining and advising patients about clinical problems).

Microbiology

deals with diseases caused by infectious agents such as bacteria, viruses, fungi and parasites. Clinical aspects involve control of outbreaks of infectious disease and dealing with the problems of infections caused by antibiotic-resistant bacteria.

Pre and Post Analytical

is a multi-faceted service providing specimen collection, transport, specimen processing for testing and the correct specimen storage to ensure the viability of testing in the areas of research and diagnostics.

Genomics

we have created a statewide genomics service which pools the expertise that exists across our laboratories into a coordinated service dedicated to delivering state-of-the-art diagnostics and care for patients with cancer, heart disease, developmental delay in children and other diseases.

Public Health

is a key part of the value we bring to the health system and includes experts across a range of areas including; disease outbreaks, laboratory investigations for notifiable diseases, responses to emerging diseases, monitoring public health trends, public health research and education, and supporting emergency preparedness.

Forensic & Analytical Science Service

provides expert scientific and forensic pathology services to the NSW criminal and coronial justice system, NSW Police, NSW Health and other key partner agencies to find answers for grieving families and the community throughout NSW.

NSW Health Statewide Biobank

exists to support and enable world-class health and medical research in NSW and is providing a pathway to better research that leads to better treatment for patients.

04

Anatomical Pathology

Research activity summary

216 Publications
- 177 Original Peer Reviewed
- 20 Review Articles
- 7 Reports/Guidelines
- 3 Books/Book Chapters
- 9 Editorials/Commentary

14 Grants

36 Research projects

29 Students

23 Editorial positions

Publications

Other Research Activity

Publication in focus

Journal citation	Lancet Oncology 2020 Feb; 21(2): 222-232 https://pubmed.ncbi.nlm.nih.gov/31926806/
Title	**Artificial intelligence for diagnosis and grading of prostate cancer in biopsies: a population-based, diagnostic study**
Authors	Peter Ström, Kimmo Kartasalo, Henrik Olsson, Leslie Solorzano, Brett Delahunt, Daniel M Berney, David G Bostwick, Andrew J Evans, David J Grignon, Peter A Humphrey, Kenneth A Iczkowski, **James G Kench**, Glen Kristiansen, Theodorus H van der Kwast, Katia R M Leite, Jesse K McKenney, Jon Oxley, Chin-Chen Pan, Hemamali Samaratunga, John R Srigley, Hiroyuki Takahashi, Toyonori Tsuzuki, Murali Varma, Ming Zhou, Johan Lindberg, Cecilia Lindskog, Pekka Ruusuvuori, Carolina Wählby, Henrik Grönberg, Mattias Rantalainen, Lars Egevad and Martin Eklund.
Partnership with	Karolinska Institute (Sweden), Tampere University (Finland), Uppsala University (Sweden), University of Otago (New Zealand), University of London (UK), Bostwick Laboratories (FL, USA), Toronto General Hospital (Canada), Indiana University (USA) Yale University (USA), Medical College of Wisconsin (USA), University Hospital Bonn (Germany), University of São Paulo Medical school (Brazil), Cleveland Clinic (USA), Southmead Hospital (UK), Taipei Veterans General Hospital (Taiwan), University of Queensland (Australia), University of Toronto (Canada), Jikei University School of Medicine (Japan), Aichi Medical University (Japan), University Hospital of Wales (UK) and UT Southwestern Medical Center (USA).

Professor James Kench

Study outcome and impact

An increasing volume of prostate biopsies, a worldwide shortage of urological pathologists and variability in grading puts a strain on pathology departments and results of treatment. This study aimed to develop an Artificial Intelligence (AI) system with clinically acceptable accuracy for prostate cancer detection, localisation, and grading.

The study initially used 6682 tissue slides from needle biopsies from Swedish patients to train deep neural networks for the assessment of prostate biopsies, before evaluating the grading performance of 87 biopsies individually graded by 23 experienced urological pathologists.

An AI system can be trained to detect and grade cancer in prostate needle biopsy samples at a ranking comparable to that of international experts in prostate pathology. A clinical application could reduce pathology workload by reducing the assessment of benign biopsies and by automating the task of measuring cancer length in positive biopsy cores. An AI system with expert-level grading performance might contribute a second opinion, aid in standardising grading, and provide pathology expertise in parts of the world where it does not exist.

04

Chemical Pathology

Research activity summary

36 Publications
- 28 Original peer-reviewed articles
- 8 Original non-peer reviewed articles

1 Grant

Publications

Other Research Activity

Publication in focus

Journal citation	Heart Lung Circ. 2020 Apr; 29(4):619-633 https://pubmed.ncbi.nlm.nih.gov/31974028/
Title	**Familial hypercholestrerolaemia in 2020: A leading tier 1 genomic application**
Authors	Jing Pang, **David R Sullivan**, Tom Brett, Karam M Kostner, David L Hare and Gerald F Watts
Partnership with	University of Western Australia, University of Sydney, The University of Notre Dame Australia, University of Queensland, and Austin Health Melbourne.

Associate Professor David Sullivan

Study outcome and impact

Familial Hypercholesterolaemia (FH) is caused by genetic variants affecting the Low-Density Lipoprotein (LDL) receptor clearance pathway. One in 250 people in Australia are born with this condition, but the prevalence is even higher (1 in 60) in some communities with a "founder gene effect". In this condition, LDL accumulation from birth accelerates the onset of heart attack and stroke by 20 to 40 years, making it the most prevalent potentially fatal genetic disorder. Lowering LDL-cholesterol with lifestyle (diet and smoking avoidance) and routine lipid-lowering therapy can reduce the risk of atherosclerotic cardiovascular disease (CVD). Unfortunately, most patients with this disorder remain undiagnosed until after the onset of preventable CVD. A national model of care has been developed and this article summarises new data for developing models of care, including new therapies.

In many cases, the associated increase in LDL is an incidental finding in routine lipid analysis. Multiple strategies are required for screening, diagnosing, and treating the disease. The model of care includes suggestions for the inclusion of alerts on laboratory blood test results, particularly when LDL cholesterol > 6.5 mmol/l. Other features allow recognition of the condition via a clinical score (the Dutch Lipid Clinics Score). Until recently, most individuals with FH struggled to reach guideline recommended LDL-cholesterol targets. A particular variant of FH led to Mendelian randomisation studies which identified a new target for therapy known as PCSK-9. Inhibition of PCSK-9 by antibodies or small interfering mRNA has safely reduced LDL cholesterol by a further 50%.

The review concludes that future care of FH in Australia should be developed within the context of the National Health Genomics Policy Framework. The second author, Assoc Professor David Sullivan, along with Dr Stephen Li and Prof Ron Trent from NSWHP, continue to provide clinical and laboratory services to treat FH. The service, which attained the Premier's Gold Award in 2006, is now supported by Medicare Benefits Schedule reimbursement for high-risk diagnostic and predictive testing."

04

Haematology

Research activity summary

76 Publications
- 34 Original peer-reviewed articles
- 21 Review articles
- 5 Reports and guidelines
- 15 Editorials and commentary
- 1 Original non-peer reviewed articles

1 Grants/scholarships

11 Research projects

9 Students

10 Editorial positions

Publications

Other Research Activity

Publication in focus

Journal citation	Int J Lab Hematol. 2021 Jul; 43 Suppl 1:129-136 (Epub 2020 Dec 3) https://pubmed.ncbi.nlm.nih.gov/33270980/
Title	**ADAMTS13 activity to von Willebrand factor antigen ratio predicts acute kidney injury in patients with COVID-19: Evidence of SARS-CoV-2 induced secondary thrombotic microangiopathy**
Authors	Brandon Michael Henry, Stefanie W Benoit, Maria Helena Santos de Oliveira, Giuseppe Lippi, **Emmanuel J Favaloro** and Justin L Benoit
Partnership with	Cincinnati Children's Hospital Medical Center and University of Cincinnati (USA), Federal University of Parana (Brazil) and University of Verona (Italy).

Home

Dr Emmanueal Favaloro

Study outcome and impact

Severe COVID-19 is often compounded by blood clotting (prothrombotic state) that is associated with poor outcomes. In this investigation, we aimed to evaluate ADAMTS13 activity and Von Willebrand Factor (VWF) level in patients with COVID-19 to see if there is a link between disease progression and acute kidney injury.

Patients presenting to the emergency department with COVID-19 were enrolled in this prospective, observational study. ADAMTS13 activity and VWF level were measured.

A total of 52 adult COVID-19 patients were enrolled. Overall, we observed that 23.1% of the cohort had a relative deficiency in ADAMTS13 activity, while 80.8% had elevated VWF levels. The ADAMTS13 activity/VWF level ratio was significantly lower in patients with severe acute kidney injury and those who developed the severe form of COVID-19.

A low ADAMTS13 activity/VWF level ratio at emergency department presentation is associated with progression to severe COVID-19 disease and severe acute kidney injury, with a pattern suggestive of secondary microangiopathy. Further interventional studies should be conducted to assess the restoration of ADAMTS13 activity/VWF level ratio in hospitalized patients with COVID-19.

04

Immunology

Research activity summary

- **5 Publications**
  - 5 Original peer-reviewed articles
- **1 Grant**
- **6 Research projects**
- **3 Students**
- **2 Editorial positions**

Publications

Other Research Activity

Publication in focus

Journal citation	Pharmacogenomics. 2020 Sep; 21(14):985-994 (Epub 2020 Sep 8) https://pubmed.ncbi.nlm.nih.gov/32896208/
Title	**Gene expression profiling in allopurinol-induced severe cutaneous adverse reactions in Vietnamese**
Authors	**Dinh van Nguyen**, Hieu Chi Chu, Christopher Vidal, Janet Anderson, Nguyet Nhu Nguyen, Nga Thi Quynh Do, Tu Linh Tran, Thuy Ninh Nguyen, Ha Thi Thu Nguyen, Richard B Fulton, Sheryl van Nunen and Suran Fernando
Partnership with	Vinmec Healthcare System, VinUniversity, Bach Mai Hospital, National Institute of Hygiene & Epidemiology, Hanoi Heart Hospital and Hanoi Medical University (Vietnam), the University of Sydney and Royal North Shore Hospital.

Home

Professor Suran Fernando

Study outcome and impact

Allopurinol is a medication used to decrease high blood uric acid levels and specifically used to prevent gout, specific types of kidney stones and to treat the high uric acid levels that can occur with chemotherapy.

Allopurinol can induce Severe Cutaneous Adverse Reactions (SCARs), including Drug Rash reactions with Eosinophilia and Systemic Symptoms (DRESS), Stevens-Johnson Syndrome (SJS) and Toxic Epidermal Necrolysis (TEN).

This study aimed to examine gene expression (the process by which the information encoded in a gene is used to direct the assembly of a protein molecule) in different clinical phenotypes of allopurinol-induced SCARs.

Gene expression profiling was performed using microarray on 11 SCARs patients and 11 controls.

The biological pathways which were significantly enriched in differentially expressed genes in SJS/TEN compared to DRESS patients included: cell surface interactions at the vascular wall, immunoregulatory interactions at the immunological synapse and MyD88 signalling pathways. Overexpression of miR146a occurred in allopurinol-tolerant HLA-B*58:01 carriers.

The study identified biological pathways which appear to be implicated in determining clinical phenotypes in allopurinol-induced SCARs. Overexpression of miR146a was noted to be potentially important for allopurinol tolerance in HLA-B*58:01 carriers.

04

Microbiology

Research activity summary

129 Publications
- 66 Original peer-reviewed articles
- 4 Review articles
- 17 Reports and guidelines
- 2 Editorials and commentary
- 40 Original non-peer reviewed articles

31 Research projects

19 Students

12 Editorial positions

Publications

Other Research Activity

Publication in focus

Journal citation	Pathology 2020 Dec; 52(7): 821-823 **https://pubmed.ncbi.nlm.nih.gov/32798071/**
Title	**Rapid deployment of pathology services to a remote Australian quarantine setting during the COVID-19 pandemic**
Authors	**James Branley**, **Matthew O'Sullivan**, **Adam Polkinghorne**, Marin Poljak, Dianne Stephens
Partnership with	AusDiagnostics Pty Ltd and National Critical Care and Trauma Response Centre, Darwin.

NSW GOVERNMENT Health Pathology

Study outcome and impact

In early February 2020, like other nations, the Australian Government launched a mission to retrieve Australian citizens from Wuhan, China, caught up in the travel restrictions imposed in the Hubei province. The mission retrieved 278 Australian citizens to Christmas Island, Australia, to undergo quarantine for 14 days. An Australian Medical Assistance Team (AUSMAT), consisting of doctors, nurses, paramedics and logisticians with expertise in public health, primary health care, acute care, infectious diseases and microbiology, was deployed to Christmas Island to provide medical support to the quarantined individuals. The AUSMAT mobile laboratory capability for diagnosing conventional respiratory pathogens was supplemented with the deployment by the Australian Defence Force (Royal Australian Air Force) of a complete laboratory-based Polymerase Chain Reaction (PCR) set-up.

As per the case definitions at the time of quarantine, individuals with clinical evidence of fever or acute respiratory infection were PCR tested. Negative samples from patients with ongoing symptoms were then subject to further testing. Subsequently, all samples initially collected were screened with this latter assay. Twelve patients were defined as suspected cases, three with persistent or severe symptoms were tested using the AusDiagnostics assay and were negative for all coronaviruses including SARS-CoV-2. These results were subsequently confirmed by reference laboratory testing.

This publication highlights the ability to implement advanced testing in a remote environment. The deployment of a commercial nucleic acid detection test for a novel pathogen in a location thousands of kilometres from a reference laboratory illustrates the unprecedented speed and accuracy required of public health response to a new infectious threat. Although no cases of COVID-19 were diagnosed, the AusDiagnostics assay was validated using SARS-CoV-2 positive samples from patients diagnosed at NSWHP Westmead-ICPMR. As a proof of concept, we have shown the successful rapid mobile deployment of conventional laboratory equipment to an extreme location for the detection of an emerging respiratory pathogen with the first AUSMAT team on the ground on Christmas Island 21 days after the SARS-CoV2 sequence was released on 11 January 2020. Similar actions may be required in other settings as public health agencies attempt to perform mass screening of individuals for SARS-CoV-2 and other emerging pathogens, where access to traditional reference laboratories is logistically challenging.

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04

Pre and Post Analytical

Research activity summary

1 Publications
1 Original peer-reviewed articles

Publications

Publication in focus

Journal citation	Australas Emerg Care 2020, 24; S2588-994X (20)30084-1 https://pubmed.ncbi.nlm.nih.gov/32981863/
Title	**Implementation evaluation of pre-hospital blood collection in regional Australia; a mixed methods study**
Authors	Kate Curtis, Jack Ellwood, Adam Walker, Siyu Qian, Paul Delamont, Ping Yu, **Jelena Stojic** and Soo Ming Phang.
Partnership with	Illawarra Shoalhaven LHD, University of Wollongong and NSW Ambulance

Study outcome and impact

In response to increasing emergency department presentations and wait times in Australia, multiple strategies and models of care have been implemented with varying results. One effective strategy has been the implementation of pre-hospital blood collection by paramedics when they insert an intravenous cannula. This study intended to determine the efficiency of, and barriers to, wider implementation of pre-hospital blood collection trials in a regional context. Particularly, the impact on time to pathology results and error rates over a 12-month period, in addition to analysing the opinions of 48 paramedics.

We saw no labelling errors in the pre-hospital blood collection group, a 65% reduction in time taken for samples to be received at pathology and a 38% improvement in the time taken for results to return from pathology for patients arriving by ambulance.

Of the interviewed paramedics, 79% were optimistic about the protocol improving patient outcomes, and 89% regarded the change in practice as acceptable. Integration of quantitative and qualitative data resulted in ten key influencers of behaviour that need to be addressed in any future implementation. These are: skills; beliefs about capabilities; social/professional role and identity; optimism; beliefs about consequences; memory; attention and decision processes; environmental context resources; social influences; behavioural regulation and goals. Wider implementation is supported by paramedics, but more training is required.

04

Genomics

Research activity summary

29 Publications
- 27 Original peer-reviewed articles
- 2 Review articles

1 Grant

8 Students

6 Editorial positions

Publications

Other Research Activity

Publication in focus

Journal citation	Lancet 2020 June 13; 395 (10240): 1855-1863 https://pubmed.ncbi.nlm.nih.gov/32534647/
Title	**Cancer prevention with aspirin in hereditary colorectal cancer (Lynch Syndrome), 10-year follow-up and registry-based 20-year data in the CAPP2 study: a double-blind, randomized, placebo-controlled trial**
Authors	John Burn, Harsh Sheth, Faye Elliott, Lynn Reed, Finlay Macrae, Jukka-Pekka Mecklin, Gabriela Möslein, Fiona E McRonald, Lucio Bertario, D Gareth Evans, Anne-Marie Gerdes, Judy W C Ho, Annika Lindblom, Patrick J Morrison, Jem Rashbass, Raj Ramesar, Toni Seppälä, Huw J W Thomas, Kirsi Pylvänäinen, Gillian M Borthwick, John C Mathers, D Timothy Bishop and CAPP2 Investigators (NSWHP; **Rodney Scott**).
Partnership with	Newcastle University (UK), University of Leeds (UK), Royal Melbourne Hospital (Australia), University of Jyväskylä (Finland), St Josefs-Hospital (Germany), Public Health England (UK), Instituto Nazionale per lo Studio e, la Cura dei Tumori (Italy), University of Manchester (UK), Rigshospital (Denmark), Queen Mary Hospital (Hong Kong, China), Karolinska Institute (Sweden), Queens University Belfast (UK), University of Cape Town (South Africa), Helsinki University Hospital (Finland), St Mark's Hospital (UK), Jyväskylä Central Hospital (Finland) and CAPP2 investigators affiliations.

Study outcome and impact

Lynch syndrome, an inherited form of colorectal cancer, is associated with an increased risk of colorectal cancer and a broader spectrum of cancers, especially endometrial cancer. Between 1999 and 2005, 937 eligible patients with Lynch syndrome, mean age 45 years, commenced treatment of daily aspirin for cancer prevention; 427 (50%) participants received aspirin and 434 (50%) placebo. Participants were followed for a mean of 10 years, and 9% of participants who received aspirin developed colorectal cancer compared with 13% of participants who received placebo. Non-colorectal Lynch syndrome cancers were reported in 36 participants who received aspirin and 36 participants who received a placebo. The case for prevention of colorectal cancer with aspirin in Lynch syndrome is supported by these results.

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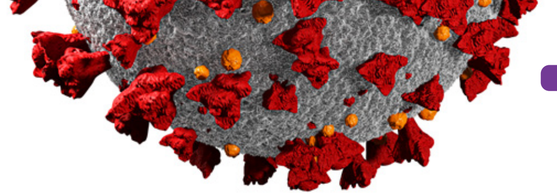

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NSW GOVERNMENT Health Pathology

04

Public Health

Research activity summary

See infographic opposite

Publications

Other Research Activity

COVID-19 2020 response and activity

On 04 February 2020 NSWHP's expert researchers grew the novel coronavirus from patient samples and it did not stop there. NSWHP researchers published or co-authored 48 peer-reviewed publications. NSWHP researchers are expected to disseminate their research and publish in the best possible outlets and in a busy year, it is remarkable to see that 75% of the COVID/SARS-CoV-2 publications are published in a first quartile (Q1) journals according to Scimago Journal & Country Rank (SJR), which means the journal is in the top 25% of journals for at least one of its classified subdisciplines.

COVID-19 research projects conducted in 2020

- Single target LOW Positive for SARS-CoV-2 diagnosis (LOW-POS) led by NSWHP Principal Investigator (PI) James Newcombe.
- Defining the immune parameters that underlie different clinical outcomes in COVID-19, a collaboration with Centenary Institute, under NSWHP PI Alice Gray.
- The effect of SARS Coronavirus type 2 on the function of human blood and respiratory tract macrophages and dendritic cells a collaboration with Westmead Institute for Medical Research, under NSWHP PI Jen Kok.
- Validation of saliva samples as an alternative to the use of Throat and Nose swabs as a method for testing for COVID-19 led by NSWHP investigators Raymond Chan and Sebastiaan van Hal.
- Awareness and Preparedness of Hospital Staff against Novel Coronavirus. A Global Survey led by NSWHP PI Dominic Dwyer.
- Collection of Coronavirus COVID-19 Outbreak Samples in NSW (COSIN), a collaboration with The Kirby Institute, led by NSWHP PI William Rawlinson.
- SARS-CoV-2 (COVID-19) Biobank led by NSWHP PIs Robert Lindeman and Stephen Braye.
- A serosurvey of healthcare workers caring for, or handling specimens from, individuals exposed to, or diagnosed with, SARS-CoV-2 infection, a collaboration with WSLHD, led by NSWHP PI Dominic Dwyer.
- Building a picture of an outbreak of COVID-19 in Ryde Hospital and community, integrating molecular characterisation and clinical data, a collaboration with NSLHD, led by NSWHP PI Bernard Hudson.

Categories of the COVID-19 publications according to Scimago Journal & Country Rank (SJR)

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NSW GOVERNMENT Health Pathology

04

Forensic & Analytical Science Service (FASS)

Research activity summary

10 Publications
- 8 Original peer-reviewed articles
- 2 Reports and guidelines

16 Students

37 Research projects

Publications

Other Research Activity

Publication in focus

Journal citation	Drug Alcohol Depend. 2020 May 28;213: 108070 https://pubmed.ncbi.nlm.nih.gov/32554172/
Title	**Toxicological analysis of serious drug-related harm among electronic dance music festival attendees in New South Wales, Australia: A consecutive case series**
Authors	Eleanor Black, Laksmi Govindasamy, Robin Auld, Kylie McArdle, Caroline Sharpe, Andrew Dawson, **Santiago Vazquez**, Jonathan Brett, Caren Friend, **Vanessa Shaw**, Sophie Tyner, **Catherine McDonald**, David Koop, Gary Tall, Deb Welsby, Karel Habig, Daniel Madeddu and Michelle Cretikos.
Partnership with	NSW Ministry of Health, The Children's Hospital at Westmead, WSLHD and NSW Ambulance

Study outcome and impact

A substantial increase in drug-related harm was observed during the 2018-2019 music festival season in New South Wales, Australia, including the deaths of five young people. As part of a rapid public health response, the NSW Ministry of Health referred samples from patients with suspected severe drug-related illness for forensic toxicological testing to identify the type and concentration of substances associated with the presentations.

Forty cases from eleven different music festivals were screened and 80.0% were aged 25 years and under. There were five fatalities, and 62.5% of cases were admitted to intensive care units. No novel psychoactive substances were detected.

3,4-Methylenedioxymethamphetamine (MDMA), commonly known as ecstasy (E) or molly, is the most frequent substance found in 87.5% of cases and concentrations were above thresholds that have been associated with toxicity in 82.9% of these. Multiple substances were detected in 60.0% of cases. Our findings strongly suggest that MDMA-related toxicity was a major factor in the severity of the clinical presentations among these cases. Other substances may have enhanced MDMA toxicity but appear unlikely to have caused severe toxicity in isolation. These findings have important implications for harm reduction strategies targeted at music festival settings.

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NSW GOVERNMENT Health Pathology

04

NSW Health Statewide Biobank

Research activity summary

- **7 Publications**
  - 2 Original peer-reviewed articles
  - 1 Review articles
  - 4 Editorials and commentary
- **1 Grant**
- **1 Research project**
- **1 Student**
- **2 Editorial positions**

Publications

Other Research Activity

Publication in focus

Journal citation	Biopreserv Biobank 2020 Feb;18(1): 14-17 **https://pubmed.ncbi.nlm.nih.gov/32069096/**
Title	**The Experts Speak on Biobank Education**
Authors	Sheila O'Donoghue, **Jennifer A Byrne**, Clive Green, Kristina Hill, Zisis Kozlakidis, Annemieke De Wilde, Piper Mullins, Kerry R Wiles
Partnership with	Experts from around the world

Study outcome and impact

Due to the many different types and models of biobanks, multiple stakeholders (researchers, funders, and participants), and the range of skill sets required to conduct the activity of biobanking, designing future biobank education is a challenge. You need to be up to date on new knowledge in science and any changes to biobanking standards, ethical guidelines and best practices.

Experts from industry and academic human biobanks from Australia, Europe, and North America shared their thoughts on the development of a new educational course on biobanking.

NSW Health Statewide Biobank's expert, Professor Jennifer Byrne, said this (and more):

"Biobanks exist to support research and provide a vital link between patients and researchers. Regular training allows biobank staff to maintain, and ultimately improve, biobanking standards so that the results of supported research are more likely to be robust and reproducible.

I found it difficult to choose between the listed training priorities, as all nominated areas are important. However, if obliged to choose, I would prioritise safety, ethical legal, and quality management."

05

NSWHP

Our structure and research committee

Our organisation is led by a Strategic Leadership Team that is responsible for setting and driving the direction of NSWHP and monitoring performance.

NSWHP's structure is focused on:

- building closer, more responsive relationships with our customers
- ensuring statewide strategies are more quickly and effectively implemented through a new operations model and stronger governance
- putting a stronger focus on the needs of regional and rural services
- a statewide service with a clear purpose of creating better health and justice systems.

The NSWHP's Research Advisory Committee provides:

- **Leadership:** monitor the Research Strategy implementation plan, identify gaps in activity and report back to the NSWHP Strategic Leadership Team
- **Advocacy:** facilitate research collaboration, promote partnering opportunities and advocate for the use of NSWHP research policies and procedures
- **Culture:** encourage a culture of sharing research activity
- **Advice:** on issues that may impact NSWHP researchers
- **Support:** grant applications, business cases and research governance
- **Promotion:** gather research material required for annual reports.

NSW GOVERNMENT Health Pathology

Our values

We always walk our talk by committing to our RITE values and behaviours.

respect
We all deserve it

We treat our patients, partners, customers and each other with respect and dignity – always. We embrace what makes us unique as individuals and communities.

r

integrity
We are trusted partners

We are honest, reliable and accountable. We care about protecting the health, safety and wellbeing of all people who rely on and deliver our services.

i

We work together connecting our partners, customers and communities to meaningful answers regardless of who they are or where they live, at every stage of life.

t

teamwork
We are one team

e

We are curious and passionate about making a difference through innovation and excellence. We push boundaries and go above and beyond to strive for the best, every time.

excellence
We lead the way

for all of us

06

Our research services

NSWHP provides a wide range of research services.

More information to be found on our **website**, including our **statwide pricing model** for research services.

Therese Atkins
Hunter New England Central Coast
Mid North Coast
Northern Sydney
Northern NSW

Toby Baldwin
NSW Health Statewide Biobank

Stephanie Hales
Forensic & Analytical Science Service

Karla Jerez
Sydney

Tony Kay
Hunter New England Central Coast
Mid North Coast
Northern Sydney
Northern NSW

Naheela Lalee
Western Sydney
Nepean
Blue Mountains

Vidiya Ramachandran
Illawarra
Shoalhaven

Andrew Sargeant
Point of Care Testing (PoCT)

Michelle Spiers
Hunter New England Central Coast
Mid North Coast
Northern Sydney
Northern NSW

Zarah Timbol
Rural and Regional NSW

Rina Upadhyay
South Western Sydney

Hayter Wong
South Eastern Sydney

If you would like to request NSWHP clinical, forensic or statewide services to support your research project, our Research Coordinators can guide you (**contact details here**).

NSW GOVERNMENT Health Pathology

Clinical trials and research projects

Data from our Research Activity Register shows that NSWHP provided research services to an additional 334 clinical trials registered to commence in 2020. There are a further 815 clinical trials that have been registered as ongoing, completed or archived, showing the extensive involvement of our research services to the wider research community.

Research services provided range from sample collection and processing, archival Formalin-Fixed Paraffin-Embedded (FFPE) tissue block and slide retrieval, tissue assessment of adequacy and processing, data entry, clinical testing, and drug toxicology testing.

Clinical trial sponsor type	Number of Trials	Percentage
Commercial	190	55%
Cooperative	60	17%
Investigator initiated	95	28%

for all of us

05

Contacts

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- Research Activity Register: Jessica Shephard (ICT Support Officer) and Dr Bente Talseth-Palmer (Research Strategy Lead)
- Strategic Communications: Sally Topp (Communications Officer)
- Clinical Stream (Research) Leads: Stephen Adelstein (Immunology), David Sullivan (Clinical Chemistry), Catherine Hitchcock (FASS), James Kench (Anatomical Pathology), Sharon Chen (Microbiology), Emmanuel Favaloro/Leonardo Pasalic (Haematology), Dominic Dwyer (Public Health Pathology)
- Clinical Services Leads: Kristen Palmer (Genomics Project Officer)
- 2020 Clinical Trials (Services data): Tony Kay, Karla Jerez, Hayter Wong, Naheela Lalee, Zarah Timbol, Marette Dean, Vidiya Ramachandran and Rina Upadhyay.

Finally, a huge thank you to all the researchers across NSWHP who have taken the time to enter data into the Research Activity Register.

Your ongoing involvement in leading and supporting research underpins our purpose to ‘create better health and justice systems’ and is a true reflection of our vision to connect, pioneer and, most importantly, care.

06

Donate

Research is an investment in the future health of our NSW community. No matter how big or small, a donation to NSWHP's Research Fund will help us create a better health and justice system.

Donations to the NSWHP Research fund are greatly appreciated and all donations go directly to funding vital research into the causes, prevention or cure of diseases.

Donations over $2 are tax deductible and you will be provided with a receipt that can be used for taxation purposes.

Donate to our research

https://www.pathology.health.nsw.gov.au/research-and-innovation/donate-to-our-research

The information and data contained in this report was accurate at the time of the reporting period (2020) but might not reflect more recent changes to our organisational structure and priorities since then.

Leading through research and collaboration to deliver excellence in service and outcomes

NSW GOVERNMENT Health Pathology

www.pathology.health.nsw.gov.au

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for all of us