



Doherty
Institute

Indigenous Health activities at the Doherty Institute



THE UNIVERSITY OF
MELBOURNE



**The Royal
Melbourne
Hospital**

A joint venture between The University of Melbourne and The Royal Melbourne Hospital

Acknowledgement of Country

We acknowledge that we are on the lands of the Wurundjeri people who have been custodians of this land for thousands of years, and acknowledge and pay our respects to their Elders past and present.

For more information about the Wurundjeri people please go to <https://www.wurundjeri.com.au/>



About the Doherty Institute

Finding solutions to prevent, treat and cure infectious diseases and understanding the complexities of microbes and the immune system requires innovative approaches and concentrated effort.

This is why the University of Melbourne – a world leader in education, teaching and research excellence – and The Royal Melbourne Hospital – an internationally renowned institution providing outstanding care, research and learning – partnered to create the Peter Doherty Institute for Infection and Immunity (Doherty Institute); a centre of excellence where leading scientists and clinicians collaborate to improve human health globally.

Located in the heart of Melbourne's Biomedical Precinct, the Doherty Institute is named in honour of Patron, Laureate Professor Peter Doherty, winner of the 1996 Nobel Prize in Physiology or Medicine for discovering how the immune system recognises virus-infected cells. The Director of the Doherty Institute is Professor Sharon Lewin, a leader in research and clinical management of HIV and infectious diseases. The Doherty Institute has more than 700 staff who work on infection and immunity through a broad spectrum of activities. This includes discovery research; diagnosis, surveillance and investigation of infectious disease outbreaks; and the development of ways to prevent, treat and eliminate infectious diseases.

The Doherty vision

To improve health globally through discovery research and the prevention, treatment and cure of infectious diseases.

The Doherty mission

The Doherty Institute will be an inspiring, innovative and enabling environment. We are dedicated to identifying and addressing fundamental challenges in all aspects of infection and immunity. Through our leadership, advocacy and education we will shape policy, practice and research both nationally and internationally.

A message from the Director of the Doherty Institute

When we opened the Doherty Institute in 2014, Wurundjeri elder Aunty Joy Murphy Wandin AM issued a challenge to our Patron and namesake, Laureate Professor Peter Doherty AC. She asked him: 'What will this Institute do to improve the health of Aboriginal people?'

Seven years on that powerful challenge continues to help shape our vision, which is to improve human health globally through discovery research and the prevention, treatment and cure of infectious diseases.

In 2017 we held our first Indigenous Health forum at the Doherty Institute and made a commitment to a meaningful and collaborative contribution to reducing the unacceptable burden of infectious disease on Aboriginal and Torres Strait Islander (Indigenous) peoples in Australia.

We don't have all the answers yet – the global pandemic of COVID-19 has taught us that – but what we do know is that the Doherty Institute will keep the spotlight on improving the health of Indigenous people in Australia by raising awareness through community engagement; performing outstanding research on areas of highest priority to Indigenous peoples; through training and capacity building for Indigenous researchers; and through strategic partnerships with other leaders in Indigenous health.

Importantly, we will continue to ensure our research translates into clear and immediate benefits.

This booklet highlights our ongoing work and our commitment to that promise.

Professor Sharon R Lewin AO, FRACP, PhD, FAHMS
Director, Doherty Institute
Melbourne Laureate Professor
Head, Department of Infectious Diseases
The University of Melbourne



A message from Indigenous Health Cross-cutting Discipline lead

Aboriginal and Torres Strait Islander (Indigenous) health is supported across multiple thematic areas within the Doherty Institute. Indigenous peoples are often a priority population in health, social and economic state and federal government strategies, such as hepatitis, HIV, employment, mental health, and most recently COVID-19. Researchers and clinical practitioners at the Doherty Institute are working on projects with Indigenous organisations and peoples. We are committed to improving the health of Indigenous peoples in Australia. This booklet provides a snapshot of the \$7.7 million in research funding the Doherty Institute is conducting with Indigenous communities in 2021.

Dr Simon Graham, PhD, M.Appl.Epid

Indigenous Health Cross-cutting Discipline Lead

Simon Graham is a Narrunga man from South Australia and a National Health & Medical Research Council fellow in the Department of Infectious Diseases, Melbourne Medical School, Peter Doherty Institute for Infection and Immunity, University of Melbourne.



Indigenous Health Cross-cutting Discipline

The Indigenous health cross-cutting discipline has developed this publication which highlights Indigenous health activities at the Doherty Institute.

This booklet provides an overview of the \$7.7 million in research the Doherty Institute is conducting with Indigenous communities in 2021. The projects focus on hepatitis B, syphilis, Human T-cell lymphotropic virus type 1 (HTLV-1), and nutrition and exercise.

Collaborations

The Doherty Institute collaborates with institutions and communities to achieve common goals and to improve health outcomes. In 2018, the Doherty Institute signed a Memorandum of Understanding (MOU) with the Menzies School of Health Research to collaborate on a range of Indigenous health activities.

Projects at the Doherty Institute involve collaborations with the following institutions and organisations:

- Menzies School of Health Research
- Monash University
- Walter and Eliza Hall Institute of Medical Research
- Miwatj Health Aboriginal Corporation
- Marthakal Homelands Health Service
- Royal Melbourne Hospital
- ASHM
- University of Queensland
- Brisbane and Gallipoli Medical Research Institute
- Greenslopes Private Hospital, Queensland
- Nirrumbuk Environmental and Health Services
- University of New South Wales
- Apunipima Cape York Health Council, Queensland
- Western Sydney University
- Bendigo and District Health Co-operative, Victoria
- University of Adelaide
- St Vincent Hospital, Sydney
- Indigenous Epidemiology and Health Unit, University of Melbourne
- Centre for Indigenous Health Equity, University of Melbourne
- Well Living House, St Michaels Hospital, Toronto, Canada
- First Nations Health Authority, Vancouver, Canada

Current projects



Strengths-based approaches: balancing Indigenous and western research practices for community benefit

Although western medicine has provided benefits for people in Canada and Australia, Indigenous peoples in both countries experience poorer health, social and economic outcomes.

One possible solution could be a shift from a deficit to a strengths-based approach. The poorer health outcomes are already well documented; however an Indigenous strengths-based approach could provide new information that could be used to design interventions that improve community outcomes. This indirectly results in community involvement in the design, implementation and continued long term benefits of the interventions because there is community leadership and involvement.

This fellowship will see Dr Simon Graham:

1. Collaborate with Indigenous researchers and community leaders in Canada in how they designed and trialled strengths-based interventions;
2. Examine how Dr Janet Smylie's team implemented the strengths-based methods with Indigenous communities; and
3. Develop a systematic review about what are the barriers and facilitators of accessing health services in urban areas of Canada for First Nations, Inuit and Métis peoples.

Lead Investigator

Dr Simon Graham, Doherty Institute

Other investigators

Dr Janet Smylie, Well Living House, St Michael Hospital and University of Toronto

Dr Nicole Muir, Well Living House, St Vincent's Hospital

Collaborating organisations

Well Living House, St Michaels Hospital
University of Toronto

Dalla Lana School of Public Health, University of Toronto

Funding

Edward Clarence Dyason Fund

Funding amount: \$4,900

Achievements and outputs

A systematic review examining the barriers and facilitators of accessing health services in urban areas of Canada for First Nations, Inuit and Métis peoples has been drafted.

Lessons from engagement with Indigenous colleagues have been used to assist in the writing of a NHMRC Clinical Trials and Cohort studies application with Indigenous colleagues in Australia which was submitted in September 2021

Benefit to Indigenous community

The review detailed the barriers and facilitators of accessing health services in urban area of Canada for Indigenous peoples.

Link to reports or published protocol or published papers

1. The systematic review will be published by the end of 2021
2. The result of the NHMRC cohort grant round will be released by March 2022

Contact

Dr Simon Graham

grahams1@unimelb.edu.au

Indigenous designed mental health interventions for First Nations, Inuit and Métis peoples in Canada

Indigenous peoples in Canada are estimated to comprise 4.9 per cent of the total population. Indigenous peoples have a strong connection of community and Land and have a holistic view of health that includes the physical, emotional, spiritual wellbeing of a person and their community.

In Canada, Indigenous compared with non-Indigenous people have higher rates of chronic and infectious diseases and lower rates of school completion and life expectancy. To reduce these poor health outcomes the Canadian government has released a number of strategies and acknowledged that culture may play a role to improve wellbeing, including mental health. In 2019/2020, the Government of Canada invested \$425 million to address mental health and well-being of First Nations, Inuit and Métis peoples through culturally grounded prevention services, supports and treatment programs. Considering the increased demand and investment in Indigenous-specific mental health interventions and programming, it is imperative to understand what components of mental health interventions are effective at improving the mental health and well-being of Indigenous peoples. Therefore, this review aimed to summarise mental health interventions that were specifically designed by, or for First Nations, Inuit and Métis peoples in Canada that decreased anxiety, depression or suicidal thoughts.

Lead Investigator

Dr Simon Graham, Doherty Institute

Other investigators

Dr Krista Stelkia, Simon Fraser University
Dr Cornelia Wieman, First Nations Health Authority
Dr Evan Adams, First Nations Health Authority

Collaborating organisation

First Nations Health Authority, Vancouver, British Columbia, Canada.

Funding

The Endeavour Leadership Program,
Australian Department of Education and Training.
Funding amount: \$42,000.

Achievements and outputs

Graham S, Stelka K, Wieman C, Adams E. Mental health interventions for First Nation, Inuit and Metis peoples' in Canada: a systematic review. *Int Indigenous Policy Journal*. 2021; 12(2): 10829

[Research Snapshot: Three key intervention components that improve mental health outcomes of First Nations, Inuit, and Métis peoples in Canada](#)

Benefit to Indigenous community

This review summarised mental health interventions that were specifically designed by or for First Nations, Inuit and Métis peoples in Canada that decreased anxiety, depression or suicidal thoughts.

The three components that seemed to make a difference were:

1. Culturally grounded indoor and outdoor activities
2. Elder and peer mentorship
3. participating in collective activities with other Indigenous peers and an Elder, including ceremony, being on land, engaging in traditional food gathering.

Link to reports or published protocol or published papers

Graham S, Stelka K, Wieman C, Adams E. Mental health interventions for First Nation, Inuit and Metis peoples' in Canada: a systematic review. *Int Indigenous Policy Journal*. 2021; 12(2): 10829

Contact

Dr Simon Graham
grahams1@unimelb.edu.au

Developing a community-led coordination and response guide for a syphilis outbreak in Aboriginal communities

For the last ten-years (2011-2020) a syphilis outbreak among young Aboriginal people has been ongoing.

In January 2011, the Queensland (QLD) governments public health unit was notified of a few infectious syphilis cases among young Aboriginal people in a remote Aboriginal community. Two years later it spread to the Northern Territory (NT), then one year later it spread to Western Australia (WA) and then two years later it spread to South Australia (SA). This outbreak has caused the deaths of four babies due to congenital syphilis. The outbreak is still ongoing in 2021. This five-year grant has two phases, phase 1 will focus on evaluating the sexually transmitted infection (STI) surveillance system at the World Health Organization (WHO) with a focus on what events trigger an outbreak investigation and how to coordinate investigations across multiple jurisdictions. This component also taps into the existing Global Outbreak Alert and Response Network (GOARN) at the WHO and the various Field Epidemiology Training Program (FETP) graduates in Asia, who have the technical skills to investigate local outbreaks in local languages and are aware of the local cultural context. Phase 2 is in two parts: 1) evaluating Australia National Notifiable Diseases Surveillance System with a focus on Aboriginal people and which events trigger an investigation; and 2) developing an outbreak guide with Aboriginal communities who already participate in a youth survey in WA, Central Australia and NSW.

Overall aim:

1. To develop a community-based syphilis outbreak coordination and response guide

Lead Investigator

Dr Simon Graham, Doherty Institute

Collaborating organisation

World Health Organization, Geneva

Funding

National Health & Medical Research Council – Investigator grant, emerging leadership 2 (2022–2026).
Funding amount: \$1,581,120.

Achievements and outputs

The project starts in 2022 and goes until 2026.

Benefit to Indigenous community

1. A guide for Aboriginal communities to lead the syphilis outbreak
2. This project changes the focus of historical investigations from investigations in Aboriginal communities to investigations with, and led by Aboriginal communities
3. Aboriginal people and communities in positions of power and leading contact tracing, funding and resource allocations, data design and collection, specimen collection and interpretation of the data, and the public health messages

Link to reports or published protocol or published papers

Graham S, et al. Prevalence of chlamydia, gonorrhoea, syphilis and trichomonas in Aboriginal and Torres Strait Islander Australians: a systematic review & meta-analysis. Sex Health.2016.13(2):99-113

Information about the syphilis outbreak can be found at www.youngdeadlyfree.org.au/young-deadly-syphilis-free/

Contact

Dr Simon Graham
grahams1@unimelb.edu.au

APPRISE targeted responses to empower First Nations-led research on COVID-19



This program was facilitated through a \$2 million donation from the Paul Ramsay Foundation to the Australian Partnership for Preparedness Research on Infectious Disease Emergencies (APPRISE) in 2020 for COVID-19 research with First Nations communities.

Eleven projects from around the country were funded, addressing community-identified needs for addressing COVID-19 in diverse contexts. The APPRISE Centre for Research Excellence is an Australia-wide network of experts involved in medical, scientific, public health and ethics research. APPRISE is funded by the National Health and Medical Research Council.

Lead Investigators

Chief Investigative Officer:

Professor Sharon Lewin, Doherty Institute, University of Melbourne (administering institution)

APPRISE-Ramsay grant co-leads:

Professor Adrian Miller, Central Queensland University
Ms Kristy Crooks, Hunter New England Public Health Unit

Other investigators

Lead grantees:

Professor Catherine Chamberlain, University of Melbourne (prev. Latrobe University)

Associate Professor Jaquelyne Hughes, Menzies School of Health Research

Professor Bronwyn Fredericks, University of Queensland

Mr Ray Christophers, Nirrumbuk Environmental and Health Services

Dr Margaret Raven, University of New South Wales

Professor Yvonne Cadet-James, Apunipima Cape York Health Council

Professor James Ward, University of Queensland

Mr Shea Spierings, University of Queensland

Professor Noel Hayman, University of Queensland

Dr Paul Saunders, Western Sydney University

Mr Dallas Widdicombe, Bendigo and District Health Co-operative

Funding

The Paul Ramsay Foundation

Funding amount: \$2 million

Collaborating organisations

Menzies School of Health Research

University of Queensland

Nirrumbuk Environmental and Health Services

University of New South Wales

Apunipima Cape York Health Council

Western Sydney University

Bendigo and District Health Co-operative

Achievements and outputs

For a comprehensive breakdown, please see the [APPRISE website](#).

A formative evaluation of the grant program was conducted by the consultancy ARTD in early 2021 and completed in August, highlighting features of the program that were well received and those that could be amended for future similar programs.

Benefit to Indigenous community

This program has implemented a First Nations-led governance model that has been widely supported and endorsed by First Nations researchers as the preferred model for grants of this sort.

While the full benefits and outcomes of the grants are yet to be finalised, the grants have already supported the employment of First Nations researchers and engagement between communities and researchers. Links have also been made between research groups.

Link to reports or published protocol or published papers

[First nations led research projects awarded to address COVID-19 community needs](#)

[Live Strong. COVID-Safe and frailty free after starting dialysis](#)

Contact

Dr Miranda Smith

miranda.smith@unimelb.edu.au

Elcho Island child nutrition project

A health survey of children aged two and under on Elcho Island with a focus on nutrition and gut health.

Lead Investigators

Professor Beverley-Ann Biggs, Doherty Institute
Sarah Hanieh, Doherty Institute

Other investigators

Mr George Gurruwiwi, Charles Darwin University
Associate Professor Julie Brimblecombe, Monash University
Emma Tonkin, Monash University
Professor Len Harrison, Walter and Eliza Hall Institute of Medical Research
Theresa Kearns, Menzies School of Health Research
Dr Jenny Shield, La Trobe University
Professor Siddhartha Mahanty, Doherty Institute

Collaborating organisations

Monash University
Walter and Eliza Hall Institute of Medical Research
Victorian Infectious Diseases Reference Laboratory at the Doherty Institute
Miwatj and Marthakal Health
Royal Melbourne Hospital

Funding

Hallmark Indigenous Seed Initiative grant
Funding amount: \$50,000

Achievements and outputs

This project raised awareness amongst community regarding the importance of gut health and the results were disseminated. The research also resulted in several publications some of which are still in progress.

Benefit to Indigenous community

Employed and trained local researcher team who have mostly gone on to other jobs.
Most of the funds were spent in community as the project teams' salaries were supported from other funds.

Link to reports or published protocol or published papers

Hanieh S, Mahanty S, Gurruwiwi G, Kearns T, Dhurrkay R, Gondarra V, Shield J, Ryan N, Azzato F, Ballard S, Orlando N, et al. Enteric pathogen infection and consequences for child growth in young Aboriginal Australian children: a cross-sectional study. *BMC Infectious Diseases*. 2021; 21(1): 9-. doi:10.1186/s12879-020-05685-1

Tonkin E, Kennedy D, Hanieh S, Biggs B, Kearns T, Gondarra V, Dhurrkay R, Brimblecombe J Dietary intake of Aboriginal Australian children aged 6-36 months in a remote community: a cross-sectional study. *NUTRITION JOURNAL*. 2020; 19(1): 12-. doi:10.1186/s12937-020-00550-y

Tonkin E, Kennedy D, Golley R, Byrne R, Rohit A, Kearns T, Hanieh S, Biggs BA, Brimblecombe J. The Relative Validity of the Menzies Remote Short-Item Dietary Assessment Tool (MRSDAT) in Aboriginal Australian Children Aged 6-36 Months. *Nutrients*. 2018 May 10;10(5):590. doi: 10.3390/nu10050590. PMID: 29748493; PMCID: PMC5986470.

Contact

Professor Beverley-Ann Biggs
babiggs@unimelb.edu.au

Evaluation of a community-led nutrition and lifestyle program for weight loss and metabolic health: a randomised controlled trial

This project will evaluate a community-led nutrition and lifestyle program in a remote Indigenous community.

This is a randomised control trial designed to develop an evidence base for an innovative community-developed and controlled, experiential learning program (Hope for Health (HfH)) that is based on the premise that traditional values and kinship are fundamental to physical health for Aboriginal people in Australia.

All adults aged 18-65 years with a body mass index (BMI) \geq 25 kg/m² living in remote Elcho Island, North East Arnhem Land will be invited to the study.

The primary objective is to evaluate the impact of the 4-month nutrition and lifestyle program on weight loss at the end of the program compared to usual care.

Secondary objectives are a) to determine the effects of the program on other key metabolic health indicators including, waist circumference, BMI, blood pressure and clinical biomarkers (fasting glucose, insulin, HbA1c, cholesterol, lipid profile and markers of inflammation), diet, physical activity and quality of life at program end.

Exploratory objectives are to understand Yolngu perspectives on the benefits and challenges of HfH, and its interface with Yolngu life and ways of experiencing health using 'ground up' participatory research.

Lead Investigator

Professor Beverley-Ann Biggs, Doherty Institute

Other investigators

Associate Professor Julie Brimblecombe, Monash University

Professor Michael Christie, Charles Darwin University

Dr John Wentworth, Walter and Eliza Hall Institute of Medical Research

Joanne Garngulkpuy

George Gurruwiwi, Charles Darwin University

Sabine Braat, Doherty Institute,

Dr Bronwyn Clark, University of Queensland

Dr Sarah Hanieh, University of Melbourne

Professor Len Harrison, Walter and Eliza Hall Institute of Medical Research

Collaborating organisations

Monash University

Charles Darwin University

The Walter and Eliza Hall Institute of Medical Research

University of Queensland

Funding

National Health and Medical Research Council

Funding amount: \$1,508,143

Achievements and outputs

This study has been Delayed by Covid. However we have:

- Received conditional ethics approval from the Human Research Ethics Committee of the Northern Territory Department of Health and Menzies School of Health Research.
- Approval and support from the Hope for Health Yolngu Steering Committee to undertake the study.
- Presented the study to the Galiwin'ku Local Authority and awaiting approval from the Local Authority.
- Support from Miwatj Health Aboriginal Corporation (Miwatj) to undertake the study.

Benefit to Indigenous community

This project will benefit the health and well-being of Yolngu people living on Elcho Island in remote North East Arnhem Land by:

- Generating evidence so that the program will continue in the community for a long time.
- The new story will bring together Miwatj and Marthakal health services, researchers, Elders and the community to talk about healthy living. It will also help health services understand Aboriginal knowledge of health and well-being so that people can work together to tackle chronic disease.
- More people will know that eating good food, exercise and work and telling/singing their traditional stories are good for their health and well-being.
- The project will provide employment and build skills in health research for local people.

Contact

Professor Beverley-Ann Biggs
babiggs@unimelb.edu.au

National Hepatitis B Mapping Project



The Viral Hepatitis Mapping Project aims to facilitate a comprehensive understanding of chronic hepatitis B (CHB) and chronic hepatitis C (CHC) in Australia by assessing variation in prevalence and care uptake according to geographic region.

Localised priority-setting is a key objective of recent healthcare reform in Australia, and enhancing access to treatment and care is a priority action in both the National Hepatitis B Strategy 2018-22 and the National Hepatitis C Strategy 2018-22. Identifying areas where prevalence is high and/or care or treatment uptake is low provides the opportunity to engage with affected communities, prioritise interventions and improve local service delivery in areas of greatest need.

The Viral Hepatitis Mapping Project's National Report and interactive Online Portal will be updated annually, to reflect both the shifting epidemiology of CHB and CHC in Australia and evaluate the impact of public health and clinical service interventions on increasing access to diagnosis and treatment at a population level over time.

Lead Investigator

Dr Jennifer MacLachlan, Doherty Institute

Other investigator

Professor Benjamin Cowie, Doherty Institute

Collaborating organisation

ASHM

Funding

Australian Government Department of Health

Funding amount: Part of the broader Doherty Institute Viral Hepatitis Surveillance Program (\$1.66 million, 2020–2023)

Achievements and outputs

Annual development of estimates of geographic diversity in chronic hepatitis B and C prevalence, management and treatment for Australia

Benefit to Indigenous community

Specific estimates by jurisdiction and by Primary Health Network of Aboriginal and Torres Strait Islander people living with chronic hepatitis B, and estimating uptake of treatment and care nationwide including in areas with a higher representation of Aboriginal and Torres Strait Islander people among those living with chronic hepatitis B.

Link to reports or published protocol or published papers

[Viral hepatitis mapping project, ASHM](#)

[Australian viral hepatitis mapping project, Doherty Institute](#)

Contact

Dr Jennifer MacLachlan
jennifer.maclachlan@vidrl.org.au

Surveillance for Hepatitis B indicators



Mathematical modeling is a valuable tool to use available data to simulate complex systems and population-wide health impacts of communicable and noncommunicable diseases.

Mathematical modeling can inform health policy in a range of ways, including establishing an evidence base for strategic service delivery targets to achieve desired population health impacts, and for tracking progress toward these targets at the subnational, national, and global level. Mathematical models can also explore the impact of uncertainty in data inputs, helping to direct research efforts toward obtaining stronger data to inform these influential parameters.

This project aims to present a mathematical model simulating chronic hepatitis B (CHB) in the Australian population for the period 1970-2030, accounting for diversity in prevalence and impact of overseas migration, incorporating detailed disease phase dynamics, and examining the impact of domestic and overseas vaccination programs, together with the impact of antiviral treatment on mortality attributable to CHB at a population level.

Lead Investigator

Professor Benjamin Cowie, Doherty Institute

Other investigators

Nicole Romero, Doherty Institute

Dr Nicole Allard, Doherty Institute

Dr Jennifer MacLachlan, Doherty Institute

Funding

Australian Government Department of Health

Funding amount: Part of the broader Doherty Institute Viral Hepatitis Surveillance Program (\$1.66 million, 2020–2023)

Achievements and outputs

Modelling of hepatitis B prevalence, attributable mortality, uptake of care and impact of treatment for Australia and by jurisdiction.

Benefit to Indigenous community

Ongoing development of specific model of hepatitis B in Aboriginal and Torres Strait Islander people to reflect prevalence, uptake of treatment, and inequities in care delivery and projected impact of improved treatment in the coming decade.

Link to reports or published protocol or published papers

[Modeling Progress Toward Elimination of Hepatitis B in Australia](#)

[Blood borne viruses and sexually transmitted infections surveillance and research program](#)

Contact

Professor Benjamin Cowie
benjamin.cowie@mh.org.au

Molecular epidemiology of hepatitis B among Indigenous people in Queensland and the Torres Strait Islands

Chronic hepatitis B virus (HBV) infection is a major health problem for Indigenous peoples in Australia.

The HBV in Indigenous populations in the Northern Territory has now been well characterised, however little is known about the HBV affecting Indigenous populations throughout the rest of Australia. This study aimed to characterise the HBV from Indigenous populations in Queensland and the Torres Strait Islands.

This project examined serum samples that were collected, with consent, from people within Queensland Indigenous communities prior to 1990 as part of the Queensland Health vaccination program. Ethics approval was subsequently obtained from the Torres Strait Island Regional Council, Torres Strait Council, Kawanyama and Woorabinda communities to further characterise the HBV from these stored samples. HBV genotype was obtained from 82 samples.

The HBV genotype strains identified were most closely related to sequences isolated from Papua New Guinea and Indonesia (Papua Province). No clear geographical distribution was obvious, possibly reflecting population movement between islands. The HBV isolated from Torres Strait Islanders was notably different to the HBV/C4 strain isolated from Indigenous people of mainland northern Australia, with no evidence of recombination. This reflects the differences in culture and origin between Torres Strait Islanders, and mainland Indigenous people.

Lead Investigator

Dr Margaret Littlejohn, Doherty Institute

Other investigators

Lesley-Anne Jaskowski, University of Queensland
Professor Graham Cooksley, University of Queensland
Professor Stephen Locarnini, Doherty Institute
Professor Darrell Crawford, University of Queensland
Rosalind Edwards, Doherty Institute
Dr Kathy Jackson, Doherty Institute
Dr Lilly Yuen, Doherty Institute

Collaborating organisations

University of Queensland
Brisbane and Gallipoli Medical Research Institute
Greenslopes Private Hospital, Queensland

Achievements and outputs

Manuscript submitted

Benefit to Indigenous community

This study has highlighted the need for additional studies with Indigenous communities in this region to further characterise both the burden of disease and document the circulating HBV strains. These studies will enable improved patient management for CHB within the Australian Indigenous communities where it continues to be a major public health burden.

Contact

Dr Margaret Littlejohn
Margaret.Littlejohn@vidrl.org.au

Investigation of hepatitis B virus (HBV) splice variants in HBV from Indigenous people in Australia

Hepatitis B virus (HBV) is a major global public health threat with over 257 million people worldwide chronically infected and over 887,000 deaths per year.

HBV causes almost 40 per cent of hepatocellular carcinoma, which is the second leading cause of cancer-related mortality worldwide. The mechanisms by which HBV causes liver cancer are not fully understood, however we have recently shown that secreted splice HBV variants are strongly associated with and indeed predictive of liver cancer in a pilot study of Australian persons living with chronic hepatitis B (CHB). Splice variants are smaller versions of the HBV genome that are incapable of replication by themselves, but replicate using proteins supplied by the wild-type (unspliced) virus.

In the Northern Territory, CHB is up to 10 times more prevalent in Indigenous peoples than non-Indigenous Australians, with associated increases in HBV liver disease, including liver cancer. In turn, CHB in the Northern Territory is characterised by presence of a unique C4 genotype, which is present in every person living with CHB investigated thus far.

As part of the CHARM study, we have received serum samples for Indigenous peoples from across the Top End of the Northern Territory. However, the association of HBV splice variants with liver disease in this setting is yet to be investigated. This project aims to investigate the type and proportion of splice variants present in the serum of individuals enrolled in the CHARM study, and determine if there are any associations with viral parameters (DNA levels, protein expression) and disease progression.

Lead Investigator

Professor Peter Revill, Doherty Institute

Other investigators

Dr Lilly Yuen, Doherty Institute

Dr Margaret Littlejohn, Doherty Institute

Hugh Mason, Doherty Institute

Funding agency

Royal Melbourne Hospital Grant in Aid

Funding amount: \$25,000

Collaborating organisation

Menzies School of Health Research

Achievements and outputs

Work in progress

Benefit to Indigenous community

Increased levels of splice variants have been linked to severe disease and we have shown an increased proportion of splice variants preceding diagnosis of HCC in a non-Indigenous Australian cohort. This study will allow us to investigate HBV splice variants in Indigenous peoples in Australia, and potentially link to clinical outcomes.

Contact

Dr Margaret Littlejohn

Margaret.Littlejohn@vidrl.org.au

Establishing the interplay between hepatitis B virus vaccination and genotype

Aboriginal Australians are disproportionately affected by viral hepatitis B (HBV) infection, with an estimated 3.7 per cent affected compared to 1 per cent for the total Australian population.

A novel subgenotype of HBV, HBV/C4, has been found in Aboriginal peoples in northern Australia with HBV. C4 has been associated with suboptimal vaccine efficacy (3) and is thought to be a more aggressive form of HBV as it is associated with more rapid liver disease progression and a higher risk of hepatocellular carcinoma. The current HBV vaccine is based on the hepatitis B surface antigen (HBsAg) of serotype *adw*-2, whilst the envelope of HBV/C4 is serotype *ayw*-3, thereby resulting in a serotype mismatch. This mismatch could possibly account for the reason why the current HBV vaccine may be less effective at preventing the spread of HBV in Aboriginal communities.

This project aims to test the hypothesis that the HBV C4 will not be neutralised or only partially neutralised by current vaccine associated anti-HBs antibody, using a mouse model for HBV infection.

Lead Investigator

Professor Stephen Locarnini, Doherty Institute

Other investigators

Ashleigh Qama, Doherty Institute

Dr Margaret Littlejohn, Doherty Institute

Professor Peter Revill, Doherty Institute

Professor Hans Netter, Doherty Institute

Collaborating organisations

University of Queensland

Brisbane and Gallipoli Medical Research Institute

Greenslopes Private Hospital, Queensland

Funding agency

Royal College of Pathologists of Australasia scholarship

Achievements and outputs

Work in progress

Benefit to Indigenous community

Published studies suggest suboptimal responses to the current HBV vaccine in Indigenous Australian populations. This suboptimal vaccine efficacy may be related to the poor match between the current Australian vaccines and the unique HBV genotype (HBV-C4) which is the predominant strain of HBV in Indigenous Australians in the NT. This work will provide an evidence base for evaluating this possibility, and lead to improved health outcomes.

Link to reports or published protocol or published papers

Manuscript in preparation

Contact

Dr Margaret Littlejohn

Margaret.Littlejohn@vidrl.org.au

Human T-cell Lymphotropic virus type 1 (HTLV-1)

Globally, an estimated 20 million people are living with HTLV-1. Infection is most common in parts of southern Japan, the Caribbean, sub-Saharan Africa, South America, and central Australia.

HTLV-1 is a virus that infects T-cells, a type of white blood cell that forms part of the immune system.

Lead Investigator

Professor Damian Purcell, Doherty Institute

Other investigators

Dr Lloyd Einsiedel, Alice Springs Hospital

Dr Paula Ellenberg, University of Melbourne

Funding agency

National Health & Medical Research Council

Funding amount: AUD \$695,000

Collaborating organisations

University of Adelaide

St Vincent Hospital-Sydney

Link to reports or published protocol or published papers

Schierhout G, McGregor S, Gessain A, Einsiedel L, Martinello M, Kaldor J. Association between HTLV-1 infection and adverse health outcomes: a systematic review and meta-analysis of epidemiological studies. *Lancet Infect Dis.* 2020;20:133-43.

Einsiedel L, Pham H, Wilson K, et al. Human T-Lymphotropic Virus type 1c subtype proviral loads, chronic lung disease and survival in a prospective cohort of Indigenous Australians. *PLOS Negl Trop Dis.* 2018

Yurick D, Khoury G, Clemens B, Loh L, Pham H, Kedzierska K, Einsiedel L, Purcell DF. A Multiplex Droplet Digital PCR Assay for Quantification of HTLV-1c DNA Proviral Load and T-Cells from Blood and Respiratory Exudates Sampled in a Remote Setting. *Journal of clinical microbiology.* 2018 Dec 5;JCM-01063

Moles R, Sarkis S, Galli V, Omsland M, Purcell DFJ, Yurick D, Khoury G, Pise-Masison CA, Franchini G. p30 protein: a critical regulator of HTLV-1 viral latency and host immunity *Retrovirology.* 2019 Dec 18;16(1):42.

Sarkis S, Galli V, Moles R, Yurick D, Khoury G, Purcell DFJ, Franchini G, Pise-Masison CA. Role of HTLV-1 orf-I encoded proteins in viral transmission and persistence. *Retrovirology.* 2019 Dec 18;16(1):43.

Omsland M, Sirtic-Benussi M, Moles R, Sarkis S, Purcell DFJ, Yurick D, Khoury G, D'Agostino DM, Ciminale V, Franchini G. Functional properties and sequence variation of HTLV-1 p13. *Retrovirology.* 2020 May 12;17(1):11.

Einsiedel L, Pham H, Au V, Hatami S, Wilson K, Spelman T, Jersmann H. Predictors of non-cystic fibrosis bronchiectasis in Indigenous adult residents of central Australia: results of a case-control study. *ERJ Open Res.* 2019 Dec 2;5(4):00001-2019.

Benefit to Indigenous community

The development of research projects with community partners forms the basis of our research practice and is essential for our success. HTLV-1 infection is highly prevalent in remote Aboriginal communities and is associated with life-threatening conditions including chronic lung disease. During the past ten years Dr Einsiedel has collaborated with a team of local Aboriginal researchers and together they have worked closely with five remote communities and four town camps in central Australia. Information from our studies is provided to participants and their communities at community meetings. Communities are understandably concerned by the impact of HTLV-1 on their communities and by the absence of treatment for HTLV-1 associated diseases. The proposed project is our response to these concerns to better understand the ongoing activity and immunopathogenic impact of virus during a lifetime.

We also have strong community links in central Australia more generally. Professor Purcell has a long standing connection to Red Dust, an Indigenous health promotion charity started by his brother in law, and Dr Einsiedel is a member of the Central Australian Academic Health Science Network (CA AHSN) that includes the Central Australian Aboriginal Congress, the Aboriginal Medical Services Association of the NT and Ngaanyatjarra Health Service. HTLV-1 is a priority area of research for the CA AHSN, and Dr Einsiedel makes regular presentations to CA AHSN and affiliated ACCHOs to keep them informed of our progress. Professor Purcell also advocates for research into HTLV-1 that will bring treatment and prevention for indigenous communities impacted by HTLV-1.


Contact


Professor Damian Purcell
dfjp@unimelb.edu.au

doherty.edu.au

 [/DohertyInstitute](https://www.facebook.com/DohertyInstitute)

 [/the-peter-doherty-institute-for-infection-and-immunity](https://www.linkedin.com/company/the-peter-doherty-institute-for-infection-and-immunity)

 [@TheDohertyInst](https://twitter.com/TheDohertyInst) [#DohertyInstitute](https://twitter.com/TheDohertyInst)

 [/dohertyinstitute](https://www.instagram.com/dohertyinstitute)