



• Virology



• Immunology



• Population Health



• International Health



**Burnet Institute**

Medical Research. Practical Action.

**A YEAR IN REVIEW 2011**



MACFARLANE BURNET INSTITUTE  
FOR MEDICAL RESEARCH AND  
PUBLIC HEALTH LTD  
A.B.N. 49 007 349 984

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**Director and CEO:** Professor Brendan Crabb, BSc(Hons), PhD

**Deputy Directors:** Associate Professor David Anderson, BSc(Hons), PhD; Professor Mike Toole, MBBS, BMedSc

**Company Secretary:** Mr Peter Spiller, BBus, CPA



**Cover:** *Children at play, Raginam Village, Morobe Province, Papua New Guinea: Burnet is helping address a number of major health issues facing communities in PNG such as reducing the maternal and newborn death rate, improving the health of women, children and young people, and helping build capacity of the health system.*

**Editorial Manager:** Gillian Chamberlain

**Design:** Kelly Watson Design

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This publication is a review of the Burnet Institute's activities during 2011, not an annual report. A full copy of the Institute's Financial Report is available on our website, or if you would prefer a hard copy, please call +61 3 9282 2111. Our Financial Report has been prepared in accordance with the requirements set out in the Corporations Act, 2001 and the ACFID Code of Conduct. For further information on the Code please refer to the ACFID Code of Conduct available at [www.acfid.asn.au](http://www.acfid.asn.au).



The Burnet Institute is a member of the Association of Australian Medical Research Institutes (AAMRI) which is the peak body representing Australia's pre-eminent independent medical research institutes. All members of AAMRI are internationally recognised as leaders in health and medical research.

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For more detailed information about our work, please visit our website at [burnet.edu.au](http://burnet.edu.au).



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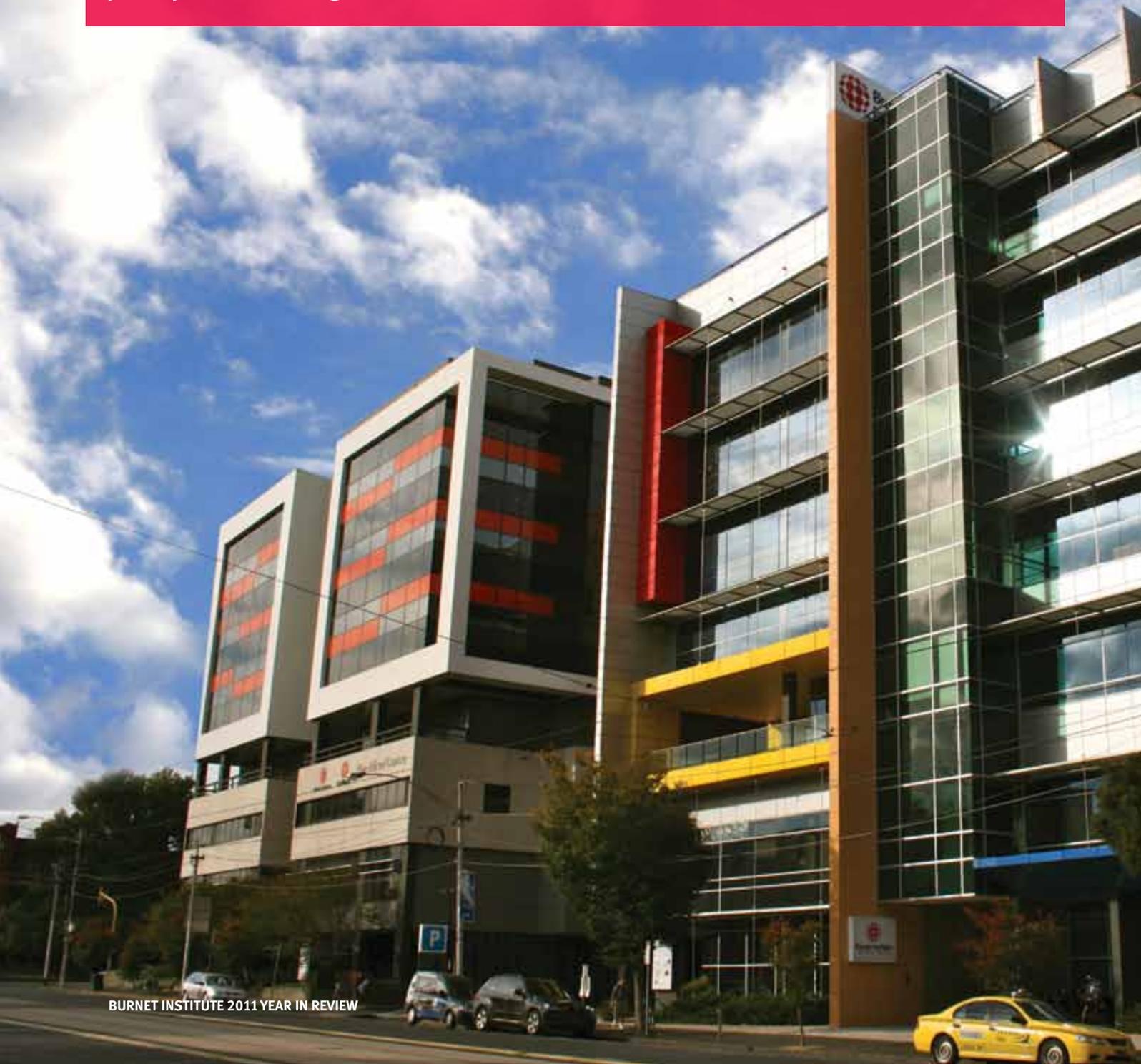
**Our Mission:** *To achieve better health for poor and vulnerable communities in Australia and internationally through research, education and public health.*

**Our Values:** *We are passionate in our commitment to working and growing together to create a healthier world. We value excellence, innovation and social justice, and share a desire to extend the boundaries of knowledge and understanding.*

Burnet Institute is named in honour of Sir Frank Macfarlane Burnet, OM, AK, KBE who received the Nobel Prize for Medicine in 1960. To learn more about how we work, visit [burnet.edu.au](http://burnet.edu.au).

## About us

*The Macfarlane Burnet Institute for Medical Research and Public Health (Burnet Institute) is an Australian not-for-profit, unaligned and independent organisation whose purpose is to improve the health of disadvantaged, poor or otherwise vulnerable people throughout the world.*



- We have a combined research and public health approach.

- Our staff comprises medical scientists, clinical researchers, epidemiologists, public health practitioners, educators and administrators.

## Our Approach

The premise of Burnet's unique approach to link medical research with public health action is that solutions to many of the major global health problems require comprehensive and innovative responses ranging from novel discoveries, such as the development of new vaccines and diagnostic tests, to the better deployment of existing best-practice health interventions.

**Our approach to address complex health issues is twofold:**

- 1 to generate new knowledge and health intervention tools,
- 2 to apply the best available evidence to community-level public health programs.

As evidence of our combined research and public health approach, the Burnet Institute is formally accredited with both the Australian National Health and Medical Research Council (NHMRC) and the Australian Agency for International Development (AusAID). We are the only organisation in Australia with this dual accreditation.

### Scope of our work

We have particular expertise in specific infectious diseases of global health significance (especially HIV and AIDS, hepatitis viruses, influenza, malaria and emerging infectious diseases), and in understanding the immune responses and developing therapies to these infections and other human diseases including some cancers.

Burnet also focuses on drug and alcohol use, both in addressing risky behaviours associated with transmission of infectious diseases and as major health problems in their own right.

Translating new knowledge into health practice is also a major focus of our extensive work with affected communities in Australia and many countries in our region and beyond. While based in Melbourne, the Burnet Institute has long-term offices in: China, Indonesia, Lao PDR, Myanmar (Burma) and Papua New Guinea; as well as activities in a number of other Asia and Pacific countries. Approximately a third of our staff are based in these overseas offices.

### Staff expertise and diversity

Our staff comprises medical scientists, clinical researchers, epidemiologists, public health practitioners, educators and administrators. Burnet Institute has many research students studying for their Masters or PhD degrees and numerous postdoctoral graduates in training.

## Leadership

The richness and diversity of experience and skills amongst our outstanding leadership team is matched by their dedication and commitment to lead Burnet's mission.

**Director and Chief Executive Officer**  
**Professor Brendan Crabb**

**Chairman**  
**Mr Alastair Lucas AM**

**Deputy Directors**  
**Associate Professor David Anderson**  
Head, Office for Business Development, Innovation and Research

**Professor Mike Toole**  
Head, Centre for International Health

**Executive Management**  
**Professor Brendan Crabb**  
Director and CEO

**Associate Professor David Anderson**  
Deputy Director, and  
Head, Business Development

**Mr Geoff Drenkhahn**  
Chief Operating Officer

**Professor Margaret Hellard**  
Head, Centre for Population Health

**Mr Paul Rathbone**  
Executive Officer, and  
Head, Public Affairs and Communications

### Senior Management

**Mr Paul Duffy**  
Head, Human Resources

**Associate Professor Bruce Loveland**  
Head, Research Support and Facilities

**Ms Ruth Rosh**  
Head, Advancement

**Mr Peter Spiller**  
Chief Financial Officer, and  
Company Secretary

**Mr Paul Stephens**  
Head, Information Technology

**Mr Mark Tennent**  
General Manager, Centre for  
International Health

### Centre Heads

**Professor James Beeson**  
Head, Centre for Immunology

**Professor Suzanne Crowe AM**  
Co-Head, Centre for Virology

**Professor Margaret Hellard**  
Head, Centre for Population Health

**Professor Sharon Lewin**  
Co-Head, Centre for Virology

**Professor Mike Toole**  
Head, Centre for International Health

# Our year at a glance

In 2011, more than **4,000** blood samples were collected from participants involved in Centre for Population Health projects both in Australia and overseas.

Nearly **10,700** young people

have participated in Burnet's Sex, Drugs and Rock'n'Roll study conducted at the Big Day Out music festival since 2006.

**79:**

the percentage of pregnant women in our project area in Vilabouly District of Laos who in 2011 received thiamine supplements, which prevent life-threatening beriberi in their babies.

*In 2011, Burnet Institute celebrated its 25-year anniversary with events at Government House, Melbourne and Parliament House, Canberra. This was a great milestone in our history and gave us an opportunity to reflect on our significant achievements over this time and to thank many of those who contributed to this success.*

While the celebrations were an opportunity to reflect, we also launched our five-year strategic plan, which will guide us into the next phase of our development.

This plan recognises six themes that are the strategic focus of our work, which will operate across our four Centres. These themes are: Sexual and Reproductive Health; Maternal and Child Health; Young People's Health; Infectious Diseases; Alcohol, Other Drugs and Harm Reduction; and Immunity, Vaccines and Immunisation. These themes will deliver new cross-centre programs, which address key health issues within each theme.

Key events during the year included the annual Burnet Oration which saw a large crowd hear Nobel Prize winning scientist Laureate Professor Françoise Barré-Sinoussi speak on her identification of HIV and her work since this discovery. Our inaugural Excellence Awards recognised many of Burnet's scientists for their achievements during the year and also gave us an opportunity to recognise and thank the many supporters who provided funds for the Institute's work.

Our strong translational research has seen further development of the Institute's rapid point-of-care tests for CD4 T-cells and for diagnosis of

More than

**1 Billion**  
malaria parasites  
are grown every day at Burnet.

Burnet has **25 different**  
families of patents

and patent applications in the areas of vaccines, diagnostics and therapeutics that are at various stages of development by commercial partners.

Papers by Burnet scientists were cited **2,344 times** by authors of other scientific peer-reviewed publications.

**165**

peer-reviewed scientific papers were published by Burnet researchers.

syphilis, and significant progress in the development of a candidate vaccine for hepatitis C.

Peer-reviewed publications were at an all time high and included papers in the world's highest impact journals as well as many in more discipline-specific publications that have made a major contribution to health knowledge. Also, the Centre for Research Excellence into Injecting Drug Use (CREIDU) was formally launched during the year with the aim of improving the health of people who inject drugs.

Burnet's Board along with its research and public health teams were

strengthened with new appointments during the year. We welcomed new Board Members Professor Pip Pattison, Ms Mary Waldron and Professor Christina Mitchell. We expanded our research and public health teams with the appointments of Professor James Beeson, Dr Jack Richards, Professor Stanley Luchters, Dr Irina Caminschi, Dr Mireille Lahoud and their respective teams.

Members of our staff and Board were recognised in the Queen's Birthday Honours list with Mr Alastair Lucas, Professor Suzanne Crowe and Ms Natasha Stott Despoja each awarded a Member of the Order of Australia.

*Overall 2011 was a year of strong performance across the Institute and we look forward to further successes in 2012.*

# Our year at a glance

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# 299

**subject enrolments** into the Masters of Public Health, and other short courses, offered by Burnet's Centre for International Health.

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The Burnet-managed China Australia Health and HIV Facility forged 26 **China-Australia research institute partnerships**, which led to **130 journal publications**.

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Every year Burnet's laboratories go through more than **70,000 serological pipettes**.

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## Research Leadership

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*Whilst many of Burnet's research and public health activities involve collaborations with partners such as universities, other institutes or other NGOs, our researchers are also taking the lead on several innovative partnerships, such as CREIDU and COMPASS. In 2011, these partnerships involved complex multi-Centre activities that further illustrated the strong reputation and expertise of our staff.*

The Burnet ImmunoMonitoring Facility was involved in **five major human cohort studies and three clinical trials** in 2011, which resulted in **over 1,000 blood samples and immunoassays** measuring key biomarkers of immunity.

Our Burnet team in Lhasa, Tibet distributed **44,000** HIV prevention education kits.

**ZERO:**

the number of measles cases reported since 2007 in Papua New Guinea, where Burnet has supported the Responding to Measles and other Vaccine Preventable Illnesses Project since 2004 (in 2002, there were 17,620 cases reported).

#### **Centre for Research Excellence in Injecting Drug Use (CREIDU)**

CREIDU is a \$2.5 million NHMRC-funded Centre of Excellence headed by Professor Margaret Hellard from Burnet's Centre for Population Health. CREIDU is a collaboration between the Burnet Institute, the National Drug and Alcohol Research Centre, the Kirby Institute, Turning Point Alcohol and Drug Centre, the National Drug Research Institute, the University of Queensland, the ACT Corrections Health Program, Anex, Harm Reduction Victoria and Hepatitis Victoria, and its key aims are to build capacity in the sector and effectively communicate and translate research into policy and practice.

#### **Compass Women's and Children's Health Knowledge Hub**

Compass is an AusAID-funded program jointly led by the Burnet Institute, the Menzies School of Health Research and the University of Melbourne's Centre for International Child Health, and it synthesises research to strengthen the evidence for effective health interventions for adolescent girls, pregnant women and children.

#### **Australian Association of Medical Research Institutes (AAMRI)**

This body represents the 41 independent medical research institutes in Australia and their 8,000 staff and students.

Burnet Director and CEO, Professor Brendan Crabb will take up the role of President of AAMRI in late 2012. This coincides with a particularly important time from a national policy perspective with the release of the McKeon Review of health and medical research to be released in the closing months of 2012. This review will provide a blueprint for the Federal Government's next 5-10 year plan with respect to health and medical research, and AAMRI is one of the key advocacy and advisory bodies involved in contributing to this review and its outcomes.

# Our year in review



## Our Accomplishments

*On many fronts, 2011 was an extraordinary year of success. Key amongst these is our performance in peer-reviewed publications and technical reports, grants, fellowships and prizes won in a highly competitive environment by our staff and students and the accomplishments of those in our international offices making an extraordinary contribution in difficult settings.*

The key measure by which we quantify our performance in research is the number and quality of peer-reviewed publications. In this regard, 2011 was an extraordinary year, **publishing more than 150 papers**, almost 20 per cent more than in any other calendar year. Many of these papers were in the **world's leading scientific research journals** and can be expected to make a major impact in the health area in which they are focused. For example, in 2011 the Institute published a paper on the recorded decline of HIV in our nearest neighbour, Papua New Guinea (PNG), a finding that has important implications for future control of this devastating disease. We published papers on other infectious diseases such as malaria, hepatitis viruses and influenza, and on harms associated

with community health risks such as alcohol and injecting and non-injecting drug use. We've published papers that address maternal and child health, sexual and reproductive health and prison health, as well as young people's health, all of which make a significant contribution to knowledge in a way that helps **direct better interventions and prevention** programs.

In addition to research publications, we publish a number of technical reports often commissioned by major United Nations (UN) agencies and government bodies that also have a strong research component and **contribute directly to new policies**. For instance, together with World Vision, the Burnet Institute released a policy report on improving maternal,



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**Professor Brendan Crabb,**  
Director and CEO

newborn and child health in PNG through family and community health care. This document, like many others we have produced, makes a **profoundly important contribution** to identifying ways to improve health systems in poor and remote settings.

The two examples given above are important illustrations of the sort of work we do but there are many others that could just have easily been chosen to discuss.

All of our staff have contributed to publicly available knowledge through these publications. **This collective effort is our greatest achievement** in 2011.

Our staff continue to be recognised for their achievements by the awarding

of highly competitive grants and fellowships and by the winning of prizes of many sorts. Especially gratifying are the **many students who have won awards** to present their work at national and international meetings. Congratulations to all of those who **graduated from their PhDs, Honours and Masters degrees** for work performed at Burnet. Special mention should go to our Gust-McKenzie medallist and Fenner Award winners, Associate Professor Paul Gorry and Professor Sharon Lewin, these are the most prestigious prizes on offer in the Institute.

Finally, recognition is due to **the more than 100 staff who work overseas** in our country programs for their extraordinary achievements.

The impact of the work of these individuals is often profound and much more far-reaching than the numbers of staff would suggest possible and the Institute is fortunate to have such passionate and technically expert people working in often challenging settings.

*You will find more comprehensive information about our peer-reviewed journals and other achievements at **burnet.edu.au**.*



## A few words from the Chair

*Notwithstanding the excellence of Australia's contribution to medical research and global aid, Australia's spending in these areas must increase if we wish to stay amongst the world's best.*

While we all understand governments' budgetary constraints, Australia's financial commitment to medical research and global aid is critical to a contribution to world development commensurate with our undoubted capacity.

Australian per capita expenditure on medical research is significantly lower than that of the US and Great Britain. While our medical research sector is undoubtedly excellent, if we do not increase our expenditure in this area over time we run a significant risk of becoming non-competitive in a global market,

and losing our talented scientists overseas. Medical researchers and the broader community will be watching with interest the outcomes of the McKeon Review into medical research funding. I would call on all Australians to support a commitment to invest strongly in this sector and thus reap the benefits of a knowledge economy and the savings associated with improved health outcomes for all Australians.

The Government's intention to increase its foreign aid budget to 0.5% of Gross National Income (GNI) should be applauded. However, the announcement in the recent budget to delay the timetable to achieve this target was a significant disappointment. Australia is ranked 13th of the 23 OECD countries in aid as a % of Gross National Income. As a wealthy country – one whose economy has performed more strongly than many of the countries who are more generous than we in global aid expenditure – Australia has a responsibility to less fortunate countries and I would urge the Government to commit to achieving the global target of 0.7% of GNI as quickly as possible.

It is essential for us to develop a greater community and political profile around medical research and foreign aid and to continue to emphasise the significant

contribution these sectors make.

We must become greater advocates of our successes in research and public health, all of which result in reduced expenditure of the health budget and a healthier and safer world.

The tangible benefits medical research and public health can make, especially to poor and vulnerable communities, is the very reason I and many others support the work of the Burnet Institute and I would ask that you too become an advocate of our work and the amazing contributions we make to global health.

This annual review highlights some of the Institute's achievements during 2011 and provides me with an opportunity to also thank those who have helped in ensuring yet another productive and successful year.

I would like to acknowledge and thank the Victorian Government for its support of the Burnet Institute through the Department of Business and Innovation and its Operational Infrastructure Support (OIS) Scheme. The general costs of operating the Institute have increased substantially over the past few years and the impact of difficult economic times has meant the OIS Scheme is even more important in providing some of the funds we need to operate. I also acknowledge

and thank the NHMRC for its support of our researchers and AusAID for its support of many of our international health activities.

Thank you to the many Trusts and Foundations who have funded specific programs and equipment, especially The Ian Potter Foundation for its wonderful generosity in funding the fit-out of our new malaria laboratory.

I am privileged to work alongside a group of hardworking and dedicated Board members who donate their time to the Institute. Much of the work of the non-executive directors goes unseen, but I can assure you that their contribution and level of commitment to the work of the Institute is tremendous. Long-standing Board Member, Mrs Maria Myers AO, left the Board at the end of 2011 to pursue other commitments.

Maria made a huge contribution to the Institute not only with her input into the discussions and decisions of the Board, but also in her commitment to developing the Institute's fundraising strategy and relationships with the philanthropic sector.

We welcomed three new Board Members to the Institute: Professor Philippa (Pip) Pattison, University of Melbourne's Deputy Vice-Chancellor (Academic); Ms Mary Waldron, Managing Partner: Networks, Strategic Marketing and Communications PwC; and Professor Christina Mitchell, Dean, Faculty of Medicine, Nursing and Health Sciences, Monash University. These appointments bring a significant level of expertise and skill to the Board and I look forward to working with Pip, Mary and Christina.

Strong leadership is an essential component of successful organisations and the Institute is fortunate to have Professor Brendan Crabb as Director and CEO. Brendan's strategic thinking and scientific talent, together with his capacity to motivate and enthuse his staff, has resulted in increased productivity and overall improvement in excellence in our research and public health activity.

Our increased productivity and success is only possible as a result of those in the community who support the Institute through their financial contributions and in-kind support. There are many people who are very passionate about the work of the Institute and I want to thank you for your continued support.

I do want to acknowledge the wonderful support provided to the Institute by Sir Zelman Cowen who passed away recently. Sir Zelman showed enormous passion for the work of the Institute, especially our work with poor and vulnerable populations. As a Patron of the Institute, he was instrumental in the formation of the Sir Zelman Cowen Fellowship Fund to fund the work of young scientists. Sir Zelman's advocacy and enthusiasm will be missed by us all.

I was delighted to be a part of the Institute's 25th Anniversary celebrations, which were held during the year. Key events at Parliament House in Canberra and at Government House in Melbourne gave me the opportunity to meet many supporters of the Institute including donors, alumni, political leaders and peers. It was very pleasing to hear how proud they were of our achievements and the high level of satisfaction many felt at being able to play a part in this.

I look forward to another year of research and public health achievements and to sharing these with you in the future.

Lastly, and most importantly, I thank the Burnet staff. Their talent and commitment to Burnet's mission is truly inspirational and I thank them all for their contributions during the year.



“We must become greater advocates of our successes and breakthroughs in research, our public health disease prevention strategies and education.”



**Mr Alastair Lucas AM**  
Chair,  
Burnet Institute

## A few words from the Director

*I am pleased to report on another year of strong achievement and productivity. We have established and are now implementing our five-year strategic plan that centres around our mission of improving the health of the poor and vulnerable using an approach that closely links research to public health practice.*

Our publications are at an all time high, we continued to **translate our research findings**, such as the candidate hepatitis C vaccine and the CD4 point-of-care diagnostic test, towards commercial development, and we maintained strong international and public health output. These, together with other key performance markers, are **strong indicators that the Institute is on track**. Importantly, we also bedded down some new initiatives such as our cross-Institute health themes and Principals that will help us achieve our goals.

Financially, it was a tougher year for the Institute with income from State Government and international health donors down on the previous year. This followed a reasonably strong financial performance the previous year. So while things go up and down in the not-for-profit sector, like everywhere perhaps, we are **charting a cautious approach** ensuring we remain strong in the face of a potentially tough external funding environment on some fronts into the immediate future. Having said that, there is real optimism that with the clear plan we have for the next five years, **our strong property performance** and donors actually increasing their contributions in some sectors, **most notably in AusAID**, we will continue

the sense of forward momentum the Institute has established.

As mentioned earlier, we commenced implementation of our strategic plan in 2011. One of the key features of this plan is the development of a newly articulated thematic approach to our work.

These six themes are:

- *Sexual and Reproductive Health*
- *Maternal and Child Health*
- *Young People's Health*
- *Infectious Diseases*
- *Alcohol, Other Drugs and Harm Reduction*
- *Immunity, Vaccines and Immunisation.*

The purpose of these themes is to develop new research initiatives that have a **strong translational focus** that cuts across our existing Centres.

We have been steadily building our scientific and public health research and development capacity and expertise in key areas, **attracting a number of highly credentialed staff** to the Institute. To our Centre for Immunology we welcomed new laboratory heads, Professor Ken Shortman, Dr Irene Caminschi and Dr Mireille Lahoud from the Walter and Eliza Hall Institute, **boosting our area of expertise** in dendritic cell research.

These cells are centrally involved in immunity and give us a better understanding of how they operate and offer us new approaches to vaccination. We also welcomed Dr Stanley Luchters, a highly experienced international health researcher and physician to strengthen our capacity in women's and children's health and sexual and reproductive health.

The Institute was privileged to be able to host a visit from **Laureate Professor Françoise Barré-Sinoussi** who presented the 2011 Burnet Oration to a public audience of more than 400 people. Professor Barré-Sinoussi was recognised with the Nobel Prize for Medicine and Physiology in 2008 for her work in identifying the virus responsible for HIV and AIDS. Subsequent to her visit, **Melbourne was given the honour of hosting the 2014 International AIDS Congress**, with our Co-head of the Centre for Virology, Professor Sharon Lewin, named as the Australian Conference Chair. As the largest biomedical conference ever held in Australia, this will be an unparalleled opportunity for us to showcase Burnet's work and highlight important health themes to the wider community.

Our new website was launched during the year, providing us with a **new user-focused communications tool** that has already more than doubled the numbers of people visiting the site. I would like to thank our team that project managed this important and difficult project, and importantly our major donor, who wishes to remain anonymous, for providing the funding for the development of the new site.

I would like to sincerely thank the Board of Directors for their support and generous contributions during the year. A special thank you to our Chair, Mr Alastair Lucas AM, who has provided valuable counsel and has an amazing level of enthusiasm for our work. I also thank the members of various board committees that provide input to and oversight of the Institute's activities. In addition to the Board, I also thank the executive management team for

their commitment, input and support throughout the year.

It was especially pleasing to have our Chair, Mr Alastair Lucas, Board member, Ms Natasha Stott Despoja, and Co-head of our Centre for Virology, Professor Suzanne Crowe recognised in the Queen's Birthday Honours list. Each was **awarded an Order of Australia** for their contributions not only to Burnet but also to the wider community. I would like to congratulate our **major award recipients** for 2011: Professor Sharon Lewin was awarded the Frank Fenner award, Associate Professor Paul Gorry, the Gust-McKenzie Medal, and Dr Paul Ramsland, the inaugural Robert Blain Fellowship.

The Institute has an **amazing group of talented** laboratory researchers, public health professionals and corporate support staff, some of whom work overseas often in very difficult and challenging political environments. **Thank you for your contributions** during the year and your commitment to the Institute.

I would like to **acknowledge and thank** all those who left the Institute during 2011 to pursue new opportunities and wish you every success in your future endeavours. I also **welcome new staff** and students who joined the Institute in 2011. I know your time at the Institute will be a rewarding and productive time in your career.

Finally, I would also like to thank our donors for their wonderful support of the Institute. Our capacity to develop and implement new programs is only possible with **this support and it is very much appreciated and valued.**

I have been privileged to meet many of our donors and they all share a similar passion for our work in helping to achieve better health for the poor and vulnerable communities we serve.



“I would like to thank our donors for their wonderful support of the Institute. Our capacity to develop and implement new programs is only possible with this support and it is very much appreciated and valued.”



**Professor Brendan Crabb**  
Director and CEO,  
Burnet Institute

# Community Engagement

## Sex, Drugs & Rock 'n' Roll

Burnet attends the Big Day Out music festival in Melbourne to study sexual health and drug risk behaviours in young people. This serves also as a forum for raising awareness of Burnet's research in these areas and elicits strong support amongst festival attendees.



Young people attend Burnet's tent at the Big Day Out for sexual health and drug risk behaviour research.

## Burnet celebrates 25 years

Some of Victoria's most senior officials were present at a special garden party at Government House to celebrate the Institute's 25th Anniversary. The function was hosted by the then Governor of Victoria, Professor David de Kretser AC and Mrs de Kretser. Minister for Health and Ageing, the Hon David Davis MLC, the Rt Hon Sir Zelman Cowen AK and Lady Cowen, were among more than 500 guests. Guests celebrated the contributions Burnet has made to global health and the role the many supporters of the Institute had played.



We celebrated our 25th Anniversary at Government House in Melbourne.

## NHMRC Budget Cuts rally

Burnet staff joined thousands of their peers on the steps outside Victoria's State Library to protest against a proposed cut of \$400 million to National Health and Medical Research Council funding. The rally was an opportunity to raise awareness of the importance of medical research and received wide media coverage. It was confirmed in the Budget weeks later that the funding would not be cut and would be retained at the same level as the previous year.



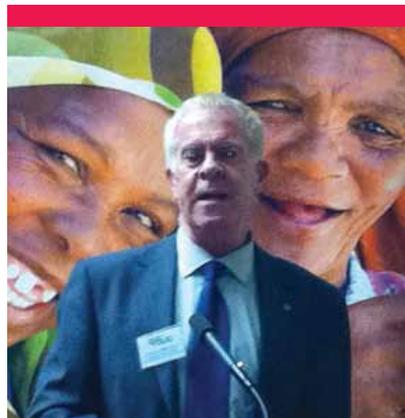
Burnet staff joined thousands of their peers to protest against proposed cuts to medical research funding.

## Student Information Evening

The Institute's leading researchers mingled with future science stars at the annual Student Information Evening. More than 30 keen students took advantage of the access to Burnet's facilities and staff, giving them a rare glimpse of life studying at the Institute. The event attracted students from the University of Melbourne, Monash University, La Trobe University and RMIT, eager to hear about the wide range of study options and projects Burnet has to offer.



Students assessing their study options at the Institute's Student Information Evening.



We joined forces with the Global Poverty Project in Canberra to leverage the Federal Government to support global efforts to eradicate polio.

## Polio Eradication program involvement

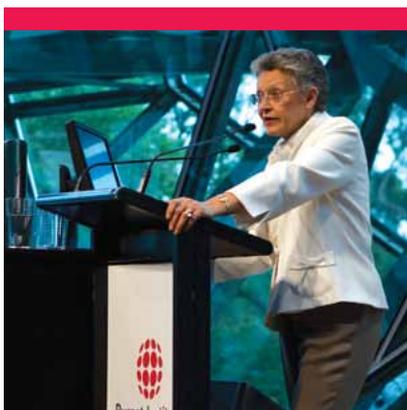
The Burnet Institute joined forces with the Global Poverty Project in Canberra to leverage the Federal Government to support global efforts to eradicate polio. The Institute's Deputy Director and Head of the Centre for International Health, Professor Mike Toole, said at the event that eradication of polio would remove a significant threat to the future of vulnerable children.

Prime Minister Julia Gillard announced at the Commonwealth Heads of Government Meeting \$50 million to be put towards the Global Polio Eradication Initiative, to help purchase vaccines, monitor outbreaks and respond when and where needed.

## Global Education Project

Burnet is committed to engaging with the Australian public to raise awareness about global health and development. This year, Burnet's Centre for International Health worked with the Global Education Project (GEP), an AusAID-funded organisation that works with teachers to integrate global education, including health and development issues, into secondary schools in Australia. Burnet staff facilitated and presented sessions on

HIV and AIDS, adolescent health, and women's and children's health at various GEP conferences and teacher training events for secondary school teachers. To engage with young Australians, Burnet also delivered a series of in-school presentations, including facilitated interactive discussions, in four secondary schools in the inner Melbourne area. These presentations focused on building understanding of development work and the role of non-government organisations, using case studies of Burnet's work to provide practical examples to explain approaches to development in the field.



*Nobel Laureate Professor Françoise Barré-Sinoussi presents the 2011 Burnet Oration.*

### Burnet Oration

The Burnet Oration is an annual keynote lecture aimed at a wide community audience addressing topical health and research issues. A capacity crowd filled BMW Edge in Melbourne's Federation Square to hear Nobel Laureate Professor Françoise Barré-Sinoussi present the 2011 Burnet Oration. Professor Barré-Sinoussi reflected on the fight against HIV and AIDS, 30 years on, and while she highlighted the significant achievements by the scientific community during those years, her clear message was that 'there is still a long way to go'.



*Burnet's Excellence Awards provided an opportunity to recognise talent and dedication.*

### Excellence Awards

Staff, supporters and friends of the Institute attended the inaugural Burnet Excellence Awards which celebrates medical research and public health achievements as well as contributions of staff and students while acknowledging the support by the philanthropic sector. The awards provided an opportunity to recognise the talent and dedication of those who are committed to furthering the vision and mission of the Institute.



*The winners of the International Day of Immunology primary schools competition.*

### Day of Immunology

Primary school children across Melbourne put their thinking caps on to produce a short video or collage to celebrate the International Day of Immunology. Run by the Australasian Society for Immunology with support from the Burnet Institute and Monash University, the competition 'The Body at War' was broken into two categories, Years one to three and Years four to six. The competition attracted more than 30 entries and engaged children in thinking about the immune system and how the body works.

## Visitors

*During the year the Institute was fortunate to host many esteemed visitors.*

**Dr Esther Aspinall**, Visiting Research Fellow, University of Strathclyde, Glasgow.

### **Professor Brigitte Autran**

Leading HIV researcher Professor Brigitte Autran from the Hôpital Pitié-Salpêtrière and the Université Marie et Pierre Curie in Paris, delivered a presentation about some exciting work investigating a unique group of patients called long-term non-progressors and elite controllers – patients who are able to control HIV and in general don't become sick. Burnet's Co-head of the Centre for Virology, Professor Sharon Lewin facilitated the visit.



*Professor Sharon Lewin with Professor Brigitte Autran (centre) and Professor Brendan Crabb.*

**Dr Monsef Benkirane**, Institut de Génétique Humaine, France.

### **Professor Zulfiqar Bhutta**

Professor Zulfiqar Bhutta came to Burnet for a special maternal and child health seminar hosted by Compass: Women's and Children's Knowledge Hub. Professor Bhutta is a maternal and child health expert as well as the Founding Chair of the Division of Women and Child Health, Aga Khan University, Karachi, Pakistan.



*Professor Zulfiqar Bhutta came to Burnet for a special maternal and child health seminar hosted by the Compass Women's and Children's Health Knowledge Hub.*

### **Canadian Government Officials**

Leading health experts from the Canadian Government took the opportunity while in Melbourne attending a conference to tour Burnet's facilities. Dr David Butler-Jones and Dr Rainer Engelhardt met with Burnet staff to discuss disease prevention and public health; as well as Burnet's perspective on the management of infectious disease outbreaks such as influenza.



*Canadian Government health experts toured Burnet's facilities.*

**Ms Jingwei Chen**, Peking Institute of Mental Health, China.

**Dr Mean Chhi Vun**, NCHADS Director, Cambodia.

**Ms Emi Chutaru**, Coordinator, North Pacific National Responses HIV and STI Section, Public Health Division with SPC (Secretariat of the Pacific Community), Pacific.

**Dr Ben David**, Chief Health Advisor, AusAID

### **Professor Don Enarson**

Scientific Advisor to the International Union Against Tuberculosis and Lung Disease (The Union) Professor Don Enarson met with staff to discuss tuberculosis control in the Asia and Pacific regions. Professor Enarson developed the current global strategy for the fight against TB and has given technical assistance to more than 20 low-income countries.



*Scientific Advisor to the International Union Against Tuberculosis and Lung Disease (The Union), Professor Don Enarson (centre), met with staff to discuss tuberculosis control in the Asia and Pacific regions.*

### **Leading Canadian researcher**

Professor Kathryn Graham, a Senior Scientist and Head of the Social and Community Interventions and Policy Research Group at the Centre for Addiction and Mental Health (CAMH) in Ontario, Canada presented the findings of Toronto's Safer Bars Program at a special seminar at Burnet. The program was designed for preventing aggression and violence in bars; data was collected from 1,000 nights of observation in bars with 300 plus capacity in which over 1,000 incidents of aggression were observed.



*Leading Canadian researcher, Professor Kathryn Graham presents her research findings.*

**Dr Karen Hennessey**, Hepatitis B Focal Point, WHO Western Pacific Regional Office.

**Professor Ma Hong**, Executive Director, National Centre for Mental Health, China CDC.

**Professor Martyn Jeggo**

Professor Martyn Jeggo (Director) and Dr John Allen (Veterinary Investigation Leader of AAHL Regional Program) Australian Animal Health Laboratory representatives visited Burnet in order to work on greater links with research and international programs.

**Dr Yan Jun**, Director of Mental Health Division, Ministry of Health, China.

**Professor James Kazura**

Professor James Kazura, President of the American Society for Tropical Medicine and Hygiene is the lead investigator with co-investigators Professor Brendan Crabb and Dr James Beeson on a project aimed at understanding how immunity to malaria is acquired in humans and the mechanisms that mediate immunity to malaria.



*Professor James Kazura (centre), President of the American Society for Tropical Medicine and Hygiene met with Professor James Beeson and Professor Brendan Crabb.*

**Dr Rozanainee Khairudin**, University of Malaysia, studying HIV drug resistant testing in the Clinical Research Lab for one month.

**Professor Alan Landay**, Professor of Immunology/Microbiology and Medicine at Rush University in Chicago and Visiting Professor National Centre HIV

Epidemiology and Clinical research Faculty of Medicine University New South Wales.



*Professor Alan Landay (centre) met with Burnet's Clinical Research team.*

**Dr Everlyn Lavu**, Director, Central Public Health Laboratory, Papua New Guinea.

**Dr Chris Maher**

The World Health Organization's (WHO) acting director of the Global Polio Eradication Initiative Dr Chris Maher presented a progress report to Burnet staff and said polio can eventually be eradicated but the program needs a huge boost in funding.



*The World Health Organization's (WHO) acting director of the Global Polio Eradication Initiative, Dr Chris Maher, presented a progress report to Burnet staff.*

**Her Excellency Ms Koleka Mqulwana**, High Commissioner for the Republic of South Africa.

**Dr Ma Ning**, Peking Institute of Mental Health, China.

**Dr Vili Nosa**, Auckland University, School of Population Health, Pacific Health Section.

**RTI International**

Senior executives from Research Triangle Institute International (RTI) visited Burnet, to increase mutual understanding of the research and public health activities that both organisations are involved in, leading to potential future collaborations.

RTI International is a consortium of USA universities and is probably one of a few organisations worldwide that has a similar research and public health mission to Burnet.



*Senior executives from Research Triangle Institute International (RTI) visited Burnet, to increase mutual understanding of the research and public health activities that both organisations share.*

**Professor Geoffrey Setswe**, Head of School of Health Sciences, Monash University, Johannesburg, South Africa.

**Noor Shah Kamawal**, HIV Coordinator, Eastern Region, Afghanistan.

**Dr Luis Sordo Del Castillo**, Visiting Research Fellow, Instituto de Salud Carlos III, Madrid, Spain.

**Dr Ron Waldman**, Pandemic Preparedness Coordinator, USAID, New Delhi.

**Ms Amanda Weir**, Visiting Research Fellow, University of Strathclyde, Glasgow.

**Professor Yu Xin**, Executive Director, Peking Institute of Mental Health, China.

# Making an impact

*While Burnet's laboratory research and public health programs address issues surrounding promoting better health and the treatment and prevention of many diseases, several major health themes underpin our work.*

## Introducing our Health Themes



### Sexual & Reproductive Health

*Sexual health can be a challenging topic but critical to the health of communities. Burnet is proud of the work we do in this area – ranging from basic laboratory science, clinical trials and epidemiologic studies through to capacity building projects, education, training, policy development and more.*



### Maternal & Child Health

*There has been major progress globally in saving the lives of young children, especially those in poor countries. But progress towards reducing maternal deaths has been much slower. Burnet has a broad approach to improving maternal and child health across the life cycle.*



### Young People's Health

*If we are to reduce risky behaviour in young people, it's important to understand the interaction between their patterns and contexts of alcohol and other drug use, and their engagement in these behaviours. Burnet works in Australia and globally to accurately measure these risk behaviours and implements interventions to reduce them.*

- 10,700 young people heard our health promotion messages.



## Infectious Diseases

*Infectious diseases remain among the leading causes of mortality in developing countries, especially in poor and vulnerable communities. Burnet has a unique blend of skills and expertise in infectious diseases and these are utilised in a diverse range of activities that include basic scientific research, clinical management, and public health responses.*



## Alcohol, Other Drugs & Harm Reduction

*Burnet's alcohol and other drug research and programs are currently concentrated in the Centres for Population Health and International Health. Harm reduction continues as a strong theme in our domestic and international programing.*



## Immunity, Vaccines & Immunisation

*Vaccines and immunisation programs remain the best defence against infectious diseases. Across the Institute, our scientists and public health workers focus on producing new vaccines, researching disease patterns and testing new approaches to implement vaccination programs.*

*“In our region and across the globe, Burnet changes people’s lives. In certain countries where the government’s policies are considered by some as questionable, organisations like Burnet rise above politics and recognise the needs and rights of individual people, their families and the communities in which they live.”*

**The Rt Hon Malcolm Fraser AC**  
Former Australian Prime Minister, and  
Burnet Institute Patron

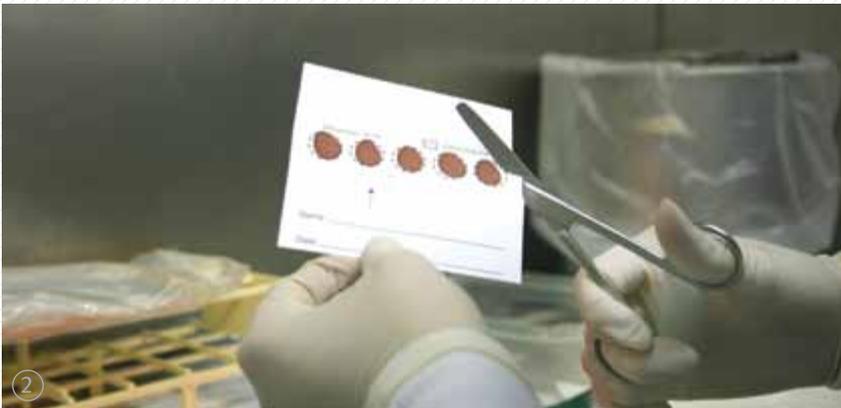
2011 HIGHLIGHTS IN:

# Sexual & reproductive health



An important global issue, sexually transmitted infections (STIs), including HIV, impact on the health of all communities and are often related to alcohol and drug use.

Sexual health can be a **challenging topic to address**, but is critical to the health of all communities. Burnet is engaged in a **broad range of research, prevention and evaluation projects** – from basic (laboratory) science projects, clinical trials and epidemiologic studies through to capacity building projects, education, training and policy development.



① Academy Award winner Geoffrey Rush appears with Denise Scott in an episode of *Queer as F\*\*K* titled — *Medicin Sans a Clue*.

② A blood spot test used to facilitate paediatric HIV care.

③ In 2011, Burnet designed a manual and provided sexual and reproductive health training to 39 counsellors in Dili and Bobonaro, Timor-Leste.

④ Starpharma's candidate microbicide VivaGel® dispensed from an applicator as used in Phase 1 clinical trials to determine safety and retention in healthy women.

- **Sexual health** can be a challenging but a critical topic to address.

- **Clinical trials** relevant to sexual health are underway.

HIV and other sexually transmissible infections (STIs) continue to be a focus for several of Burnet's laboratories and public health programs. The Drummer/Poumbourios group are working to identify **new therapeutic targets** in the structural proteins of HIV; and the Crowe group is **committed to providing validated, low-cost tests** for monitoring HIV patients in resource-limited settings. In 2011, **scientists in Papua New Guinea** were trained in the Cavid low-cost HIV-1 viral load assay and validated this for use on 'dried blood spots' to facilitate **paediatric HIV care**. The Crowe Laboratory also supports local HIV care by performing HIV viral load and resistance testing, including developing methods for detecting viral resistance to newer medications.

**Clinical trials** relevant to sexual health are also underway. With Starpharma Pty Ltd, the Tachedjian Laboratory has completed a Phase I trial of VivaGel®, a **candidate microbicide for HIV prevention**. VivaGel® retained potent anti-HIV activity for up to 24 hours following vaginal application – suggesting it may not need to be applied immediately before coitus. The Lewin Laboratory is currently involved in a trial to see whether Vorinostat (a drug used in cancer treatment) can activate latent (hibernating) HIV in patients on therapy, an **important step towards curing HIV**.

### STI Research

In Papua New Guinea, Dr Claire Ryan from our Centre for Population Health is based at the PNG Institute of Medical Research to help **establish their STI research laboratory**. The team works closely with the Kirby Institute (UNSW) on projects including the first population-based prevalence estimates of human papillomavirus (HPV), the virus necessary for **development of cervical cancer**. This will provide critical information for the PNG National Department of Health to formulate HPV vaccine introduction policy. The team also focuses on improved STI surveillance and diagnosis in PNG – including evaluating five point-of-care syphilis diagnostic tests and **establishing quality-controlled testing** for chlamydia, gonorrhoea, trichomonas and genital herpes virus.

The East New Britain Sexual Health Improvement Program, funded by AusAID, also continues to work with communities and clinicians to improve access to, and quality of, testing and treatment for STIs.

Burnet's Centres for Population and International Health have completed **sexual network studies** in both Laos PDR and Vietnam funded by AusAID. The data suggest men who report sex with both male and female partners tend to have **high numbers of lifetime partners and low levels of condom use** – and others (including 'low risk' partners) in their sexual network may also be at high HIV risk. Final reports are now available by contacting [siobhan@burnet.edu.au](mailto:siobhan@burnet.edu.au) (Vietnam) or [chad@burnet.edu.au](mailto:chad@burnet.edu.au) (Lao PDR).

### HIV and STIs

An **innovative project** to reduce the spread of HIV and STIs, the Expanded HIV Prevention Program on Lao Northern Economic Corridor (Route 3), is now closed. Supported by AusAID and the Asian Development Bank (ADB), this project aimed to reduce HIV/STI transmission in communities near major road construction projects. Burnet worked with provincial AIDS authorities to **enhance local HIV prevention capacity** and provide education to at-risk communities (including ethnic groups, truck drivers, miners, casino workers and female sex workers). **Cooperation with the private sector** (including mines and casinos) was vital. The project's evaluation confirmed that there was increased HIV knowledge among target groups, increased reported condom use and no increase in men purchasing sex – despite increased opportunity through new venues opening. Burnet is **building on this success** to implement an HIV/STI prevention program along another major road construction project in Northern Laos.

In Timor-Leste, the Centre for International Health has been working with Marie-Stopes International on a pilot project to develop a **youth friendly sexual and reproductive health** counselling manual, funded by the World Bank, UNFPA and AusAID. Burnet designed the manual and provided training to 39 counsellors

in Dili and Bobonaro in 2011. Evaluation reaffirmed that **the manual and training were effective** in improving participants' knowledge and attitudes towards sexual and reproductive health.

The increasing success and popularity of Queer as F\*\*k, originally developed by researchers in the Centre for Population Health, has established the interventions as a core part of the Victorian AIDS Council (VAC)'s sexual health promotion work. Queer as F\*\*k centres on an **online video series** hosted through Facebook describing life in a share house of gay men in Melbourne, with sexual health topics embedded within the narrative. It is one of the first attempts internationally to harness the reach and interactive potential of social networking for sexual health promotion. The latest Season Five attracted increased interest with the appearance of **Academy Award winner Geoffrey Rush**.

The Centre for Population Health remains closely involved with Queer as F\*\*k through ongoing evaluation of Victorian HIV prevention initiatives, in an advisory capacity, and through new research funding applications with the University of Melbourne and the VAC.

You can check out Queer as F\*\*k at [www.facebook.com/QAFxxk](http://www.facebook.com/QAFxxk). More about our Sexual Health work can be found on our website.

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2011 HIGHLIGHTS IN:

# Maternal & child health



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There has been major progress globally in **saving the lives of young children** in low-income settings. In the two decades since 1990, medical and public health advances have significantly saved young lives – estimated to be almost 4.4 million children under five years of age.

This has been achieved especially **through advances** in immunisation, malaria prevention, and nutrition.

Progress towards **reducing maternal deaths** however, has been much slower, and stillbirths and deaths of newborns in the first week or two of life now represent a greater proportion of deaths of children under five. The reason for this slower progress is because most **complications of labour are unpredictable** – but they can be managed well if women deliver in a health facility that can provide good emergency care.



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① Much is being done in the labs to understand the effects of malaria on pregnant women.

② Burnet has a broad approach to improving maternal and child health across the life-course.

③ Children from remote villages near the mines in Laos receive messages about healthy eating and good nutrition.

④ There is much to be done to reduce deaths due to infections in mothers immediately after childbirth. A mother and her newborn child rest.

- **Progress towards** *reducing maternal deaths has been slow.*

At Burnet we **have a broad approach** to improving maternal and child health across the life-course. We work to strengthen health service systems that tackle underlying causes such as poverty, inequalities in access to services and the low status of women. We are also developing new low-cost, point-of-care diagnostic tests, new ways to deliver medicines and interventions to prevent malaria.

### **Compass – the Women’s and Children’s Health Knowledge Hub**

AusAID’s Health Knowledge Hub Initiative aims to **increase aid effectiveness** by ensuring that evidence is reviewed, synthesised and taken up by policy makers. Within this initiative, the Centre for International Health has **responsibility for maternal and newborn health.**

Dr Chris Morgan and paediatric specialist trainee, Dr Anne Miller, completed a comprehensive analysis of **what could be done to reduce deaths** due to infections in mothers immediately after childbirth. This is especially significant in settings where many births take place at home and many mothers die in childbirth. In collaboration with World Vision and Abbey Byrne, Dr Morgan also undertook a detailed study of which community-based interventions would have the greatest impact in Papua New Guinea (PNG). The reports **provoked much discussion** and the PNG National Department of Health is now planning a national conference next year.

It is widely recognised that men, especially expectant fathers, tend to be decision-makers in relation to family planning, pregnancy, childbirth and newborn care, yet they have **little contact with health care providers.** Dr Wendy Holmes and a post-graduate student, Dr David Simon, have been exploring the varied reasons for this to make policy recommendations and **advocate for greater investment.**

Dr Natalie Gray and Dr Elissa Kennedy worked with the Vanuatu NGO, Wan Smolbag, learning lessons about how to **meet the reproductive health needs of adolescents.** They shared evidence widely about effective ways to overcome barriers to family planning services for adolescents and also improve adolescent maternal health.

In March, we co-hosted with AusAID a roundtable discussion on improving access to family planning services to enable **policy consultations** with United Nations (UN) agencies, NGOs, researchers and academics. Through the Hub we contributed to the development of AusAID’s new health policy document.

### **Promoting better maternal and child health in Lao PDR – a public-private partnership**

In Vilabouly district in southern Laos, Burnet has collaborated in an unusual community-based health project with the private sector. Lane Xang Minerals Limited funded **health and nutrition work in 15 remote villages** where workers from their copper and gold mines live. **Rates of child malnutrition were very high.** Dr Ben Coghlan evaluated the project with our local team. Community members were keenly interested in locally produced nutritious **cooking demonstrations shown to them on a TV** brought to their villages. There was also an increase in families using the health services and improved planning skills of local health officials.

### **Providing maternal and child health technical support**

**Burnet provided technical support** to other development organisations in monitoring, evaluating and improving their understanding of maternal and child health data. Through our Papua New Guinea office **we analysed data sets** for the Save the Children East Sepik Women and Children’s Health Project and reviewed their monitoring and evaluation system. This was achieved using a training and mentoring approach that **builds the capacity of their local staff.** The Lao country program office with support from Burnet staff in Melbourne, undertook a baseline household survey of children’s health and nutritional status for World Vision.

### **Researching malaria**

Malaria is a leading cause of childhood death and illness, and a major health problem among pregnant women. Burnet’s malaria program integrates laboratory-based research with clinical and population studies in collaboration with partners in malaria-endemic countries.

- **Many babies are still born with syphilis; an easy problem to prevent and treat if a low-cost clinic test was available.**

This approach involves the Beeson, Crabb, Gilson, Fowkes, Jaworowski and Hogarth research groups aiming to **understand the biological mechanisms that cause malaria disease** and immune responses that clear and prevent infection. They apply this knowledge to the development of **vaccines and other interventions to prevent malaria** and to new treatments.

In studies of Karen women on the Thai-Burma border, and of women in PNG, they have recently made major gains in **understanding how pregnant women develop and maintain immunity to malaria.** In addition to guiding vaccine research, these insights are important for new approaches to identify women at greatest risk of malaria in pregnancy. Their studies of children in PNG and Kenya are helping to understand how the immune system responds to malaria and identify new targets for a malaria vaccine. The studies have **identified new compounds** that block malaria infection and revealed essential biological processes that could be **targeted by new drugs.**

### **Preventing congenital syphilis**

Many babies are still born with syphilis; an easy problem to prevent and treat if a low-cost clinic test was available. The work of Associate Professor David Anderson and Mary Garcia has led to the development of a new, non-lab test for congenital syphilis. Clinical studies are now underway in Australia and PNG in collaboration with the National Centre for HIV Epidemiology and Clinical Research.

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## 2011 HIGHLIGHTS IN:

# Young people's health



Young adults *experience disproportionately high levels of substance use disorders, risky sexual behaviour with consequent sexually transmitted infections, blood-borne viruses, unintended pregnancy, unintentional injuries and interpersonal violence.*



To reduce risk behaviour and its harmful consequences in young people, it is important to **understand the interaction** between their patterns and contexts of alcohol and other drug use and their engagement in risky behaviours.



① Participants completing sexual health questionnaires at the Big Day Out.

② Peer educators attending a research training workshop, Vanuatu.

③ Our peer educators in Vanuatu continue to promote sexual and reproductive health messages to young people.

④ Rebecca Jenkinson from our Centre for Population Health (centre) explains to volunteers how to gather data for research into alcohol and drug use by Melbourne's nightlife patrons.

- We provide young people with condoms and information on safe sex.

- Unsafe sex and lack of contraception are leading risk factors for poor health among young people.

*Our work in Australia and globally aims to accurately measure risk behaviours in young people and implement interventions to reduce risk.*

### The Big Day Out Study 2011

For the seventh consecutive year, the Centre for Population Health conducted its **Sex, Drugs and Rock'n'Roll survey** at the Melbourne Big Day Out music festival held in January. The survey investigates sexual and alcohol and other drug-risk behaviours and knowledge. Burnet volunteers recruited 1,405 people between 16 and 29 years to undertake the survey. They also **provided young people with condoms and information on safe sex**, drugs and alcohol. Young people are at high risk of sexually transmitted infections (STIs) such as chlamydia, which can cause infertility in women.

The 2011 study revealed that over one third of participants were at risk of STIs due to their behaviour, such as not always using a condom with new, casual or multiple partners. Only one third of sexually-active participants had ever had an STI test. **High-risk alcohol consumption was also common** in this group; 30 per cent reported drinking six or more drinks in one session at least weekly, and 20 per cent reported memory loss. One quarter of young people had used illicit drugs in the past month.

Sex, Drugs and Rock'n'Roll provides valuable data on trends and patterns in young people's drinking, drug use, sexual behaviour and attributable harms. The information is used to **identify appropriate interventions**, inform policy and reduce the serious health consequences of risky behaviour in young people.

### Compass

An AusAID-funded collaboration between the Burnet Institute, the Centre for International Child Health and the Menzies School of Health Research, Compass aims to **improve the effectiveness of aid** for women's

and children's health by building knowledge, evidence and expertise in the Asia and Pacific regions.

Compass focuses on the health of young people, who suffer a **disproportionate burden of sexual and reproductive ill health**. Two-thirds of all STIs and more than 40 per cent of new HIV infections in these regions occur in people aged 15 to 24 years. Girls aged 15 to 19 years account for 11 per cent of all births but almost 25 per cent of the ill health related to pregnancy and childbirth. **Maternal conditions are their leading cause of death**. Unsafe sex and lack of contraception are leading risk factors for poor health among young people.

Compass has identified that young people may not immediately benefit from strategies aimed at improving the sexual and reproductive health of the general population. They **have unique health needs**, face particular barriers to accessing information and services, and require targeted responses.

In 2010/2011, Compass – in partnership with the Wan Smolbag Theatre – completed a qualitative study involving adolescents, health workers and policymakers in Vanuatu **to identify the sexual and reproductive health information** of importance to young people, how they would like to receive information and ways to make health services more youth-friendly.

The results of this study were presented to communities and the Vanuatu Ministry of Health to **help strengthen programs** and inform the development of National Youth Friendly Health Services Guidelines. They were also presented at regional conferences and meetings including the Asia Pacific Conference on Reproductive and Sexual Health and Rights, the Youth Health Conference, and the Family Planning Pacific Forum. We continue to work with Wan Smolbag Theatre to improve sexual and reproductive health in young people.

### Alcohol, illicit drugs and young people

Burnet researchers **conducted several unique studies** of young peoples' engagement in alcohol and other drug use. Our Centre for Population Health's research into psychostimulant (e.g. **ecstasy, methamphetamine and cocaine**) use revealed that large quantities of alcohol and psychostimulants were often consumed during the same 'session', and that heavy, simultaneous alcohol and illicit drug use was associated with an **increased risk of arguments and fights**, experiencing accidents and injuries, driving while drug-affected, uncharacteristic sexual behaviour and overdose.

Psychostimulant study participants also regularly engaged in other risky behaviours such as selling drugs for profit (drug 'dealing') and young women used psychostimulants to lose or maintain body weight. Other research into alcohol and other drug use among night-life patrons started in late 2011 and will inform harm reduction approaches in **Melbourne's entertainment precincts**.

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## 2011 HIGHLIGHTS IN:

# Infectious diseases



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*Infectious diseases remain among the **leading causes of mortality** in developing countries, especially in poor and vulnerable communities. Burnet has a unique blend of skills and expertise in infectious diseases, which are utilised across a diverse range of activities including basic scientific research, clinical management and public health responses.*

*This **cross-Centre approach** seeks to link existing activities and skills throughout the four Centres whilst expanding these programs to create more comprehensive approaches to the **prevention and management of infectious diseases**.*



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① *Scientists and students in our malaria laboratories undertake varied research.*

② *The One Health Congress focused on the disease risks and challenges brought about by the interactions between animals, humans and the environment.*

③ *This image shows the social relationships between people who inject drugs in Melbourne, Australia 2006. Source — Networks 2 study.*

• **Infectious diseases** remain among the leading causes of mortality in developing countries.

• The **'One Health'** concept recognises the interplay of common factors between animal and human health, and the environment.

## Polio

Common in Victoria in the 1950s, this food and water-borne disease is on the **verge of global eradication**, with only three countries still reporting endemic polio: Afghanistan, Nigeria and Pakistan. However, the World Health Organization (WHO) is concerned that the gains of the last 50 years will be threatened by a current worldwide gap in funding of USD \$590 million. This funding gap is impacting on previously virus-free countries such as Chad and China where wild polio virus (WPV) transmission has recently re-established. **Burnet has hosted a visit** from Dr Chris Maher, Acting Director of the Global Polio Eradication Initiative for the WHO.

Burnet's Deputy Director, Professor Mike Toole, **played a major role** in advocating for the Australian Government to commit to further funding. Burnet will also partner with the Swiss Tropical Institute to **improve polio vaccination coverage** in Chad and Pakistan where the highest number of cases were reported this year. The two Institutes will use a 'One Health' approach to combine improved human health and livelihood outcomes for **hard-to-reach migratory pastoralists**.

## One Health

The 'One Health' concept recognises the interplay of **common factors between animal and human health**, and the environment. It also acknowledges the synergy of health gains that can be achieved through improved coordination and collaboration between these sectors, especially in **preventing and identifying emerging infectious diseases** (60 per cent of which are zoonotic diseases). Burnet was strongly represented at the First International One Health Congress at the Melbourne Convention Centre. Professor John MacKenzie is an Honorary Senior Principle Research Fellow at Burnet and was Co-Chair of the Organising Committee for this inaugural event.

Centre for International Health's Dr Ben Coghlan, Dr Tony Stewart and Burnet Associate Dr Lisa Adams actively **participated in the promotion and implementation** of 'One Health' in the Asia and Pacific regions.

Their work assisted with the development of a five year strategy in Vietnam and for the Secretariat of the Pacific Community, as well as with **advocacy** to the WHO bi-regional 'Asia Pacific Strategy for Emerging Disease', the regional Tephinet in Bali, and the preparation for the European Union of **case studies** that demonstrate the advantages of the 'One Health' approach in Asia and Europe. Burnet has also joined the recently created One Health Special Interest Group of the Public Health Association of Australia.

## Malaria

Burnet's malaria expertise was further strengthened with the establishment of laboratory-based research programs under Professor James Beeson, Dr Jack Richards and Dr Freya Fowkes. As with the Gilson/Crabb group, malaria vaccine development remains a key focus of their research. Their work is advancing the **understanding of the parasite itself** and how it invades and survives inside human red blood cells.

Studying the immune responses that provide **natural protection from malaria** has also enabled further insights into potential malaria vaccine development. Vaccine development programs at **Burnet are focusing on several candidates** including apical membrane antigen 1 (AMA1), merozoite surface protein 2 (MSP2) and other proteins required for parasite invasion or survival.

The first results from the RTS,S malaria vaccine study were released this year. It is the first time a malaria vaccine has made it to a Phase III study and over **15,000 children** have been enrolled across Africa. Early analysis indicates efficacy of up to 50 per cent, but it is unknown how sustained this benefit will be and whether this will become the first licensed malaria vaccine.

Dr Tony Stewart from Burnet's Centre for International Health also completed the redesign of the next phase of **AusAID's Pacific Malaria Initiative** – one of AusAID's priority projects – in line with the donor's preferred Sector Wide Approach (SWAP) in the Solomon Islands and Vanuatu.

## Hepatitis C

Burnet continues to **work with marginalised groups** such as people who inject drugs (PWID). An important part of this work is the examination of the role of the **social and injecting networks** of PWID in **hepatitis C** transmission. This project modelled different transmission scenarios and highlighted the importance of social injecting networks in transmission. The study also demonstrated the **links between the genetic-relatedness** of viruses and these social injecting networks. These findings recognise the importance of understanding social network factors in studies of hepatitis C transmission and their **importance in public health interventions** aimed at reducing hepatitis C transmission.

## Setback to funding – Global Fund

Perhaps the lowlight of the year was the **cancellation of Round 11 of the Global Fund**. This fund provides the world's largest financing source for HIV, malaria and tuberculosis programs, supplying more than US\$21.7 billion and supporting over 600 programs in 150 countries. The governments of developed countries provide most of the funds but due to the Global Financial Crisis many are not committing to expected contributions.

The Global Fund has **enabled Burnet to support communities at risk** of or affected by HIV in Laos, Myanmar and PNG since 2010. Burnet was hoping that Round 11 would allow **scale up as well as initiate much-needed projects** on co-management of HIV and TB as well as community support for MDR-TB (multi-drug resistant TB). Burnet plans to lobby further on this important issue.

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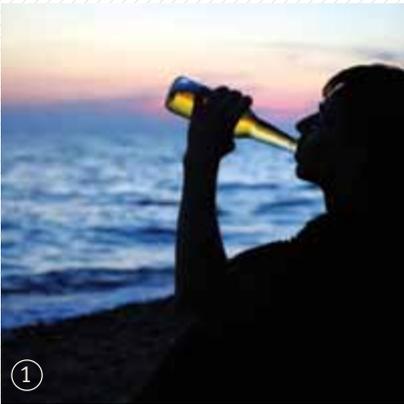
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2011 HIGHLIGHTS IN:

# Alcohol, other drugs & harm reduction



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According to the World Health Organization, alcohol is the world's third largest risk factor for disease burden, the leading risk factor in the Western Pacific and the second largest in Europe.

Up to 5.7 per cent of the world's population aged 15 to 64 use drugs, including cannabis, amphetamines, cocaine, opioids and non-prescribed psychoactive prescription medication, with cannabis the most commonly used.

The use of alcohol and other drugs can cause significant health and social problems and can have a major impact on the user's family and community.

① Alcohol is the world's third largest risk factor for disease burden, and the leading risk factor in the Western Pacific.

② The use of alcohol and other drugs can cause significant health and social problems.

③ While we continue our harm reduction work in Laos, Myanmar and Indonesia, we look to new areas of need, such as emerging drug-injecting epidemics in East Africa.

④ Representatives from government departments and civil society groups visited from East Africa to be a part of the Australian Leadership Awards fellowships program looking at alcohol and other drug use and related harms.

- Up to 5.7 per cent of the world's population aged 15 to 64 use drugs.

- Almost 140 ex-prisoners died within a year of release from drug-related causes.

Burnet is committed to addressing the adverse health affects of alcohol and other drug use through the application of **behavioural and clinical research**, treatment practice and community-based harm reduction programs based on **sound evidence**. Alcohol and other drug research and programming are based in the Centre for Population Health and the Centre for International Health.

The Drugs and Public Health Interest Group (DPHG) fosters **cross-Centre collaboration** by sharing information about potential opportunities for Burnet in Australia and the Asia and Pacific Regions. Whilst continuing a focus on drug use, injecting and HIV prevention in Asia, other international highlights include our work in Papua New Guinea (PNG) and the ongoing expansion of the Pacific Drug and Alcohol Research Network.

### Alcohol and other drugs

A notable innovation was the purchase and fit-out of a van to enable Burnet researchers to conduct fieldwork amongst the **street-based drug markets** of Melbourne. The van will also allow provision of **other services from the van** in collaboration with other specialist organisations, such as dental examinations, legal advice, and needle and syringe distribution.

A new partnership between the Burnet Institute and Deakin University has enabled the development of research examining **alcohol and the night-time economy** in Melbourne. Shared **supervision of students** and jointly-held grants underpin strong collaborative links with Turning Point Alcohol and Drug Centre, highlighted by the joint hosting of the 37th Annual Epidemiology Symposium of the Kettil Bruun Society for Social and Epidemiological Research on Alcohol. The meeting brought together 200 of the world's leading experts on alcohol research and was the first time it had been held outside of Europe or North America.

Our work continues to focus on prospective studies of drug use and related harms, with high follow-up rates of participants across all studies. In the UnMet study, an **examination of treatment engagement** by people who

use methamphetamine, more than 80 per cent of participants recruited in 2010 were followed up in 2011. Similarly high rates of follow-up across all of our studies **highlights how effectively** Burnet's fieldwork teams engage with participants who are often from marginalised and vulnerable populations.

### Harm reduction

Harm reduction remains a key theme in our domestic research and international programs.

Burnet Institute's Head of Justice Health, Associate Professor Stuart Kinner, called for the establishment of a **national system for the routine monitoring of deaths of ex-prisoners** following the findings of a major study released in 2011. Research collated by Associate Professor Kinner and University of Queensland researcher Simon Forsyth estimated that among adults released from prison in Australia in 2007/08, almost 140 died within a year of release from drug-related causes.

Head of Burnet's Alcohol and other Drug Research Group, Professor Paul Dietze, was part of the Expanding Naloxone Availability in ACT (ENAACT) committee and will have an ongoing role in evaluating the program. An **Australian-first program** distributing Naloxone – an opioid overdose reversal drug – to potential overdose victims was launched in 2011 in Canberra. Naloxone will be available on prescription for those most at risk to overdose and friends or family members trained to administer it.

We also reviewed the viability of **Medically Supervised Injecting Facilities** for the Yarra Drug Health Forum to contribute an objective perspective to the debate on the feasibility of this innovative harm reduction intervention in Victoria.

In Asia, drug injecting and the risk of transmitting blood-borne viruses is at the core of our HIV prevention activities. In Myanmar, we continue to **build the capacity** of the Myanmar anti-narcotics Association (MANA) and other civil society partners to **effectively respond** to drug use and related harms, including HIV. In the Lao PDR, we train and support peer educators who work with **sexually active young people** to address sexual risk

behaviours associated with alcohol and amphetamine use.

In the Pacific, including Papua New Guinea, the main concern for harm reduction is the impact of excessive alcohol use on individual, family and societal well-being and we are developing research and initiatives to address these important issues. However, our work on harm reduction and injecting drug use continues. Burnet, through the Centre for International Health, is a partner on two bilateral HIV prevention programs in Indonesia (funded by AusAID and USAID) that work 'to reduce harm among people who inject drugs and commercial sex workers, and the community organisations that support them. These programs, working through Government of Indonesia structures, aim to address the harmful consequences of drug use and to strengthen the in-country agencies that target high risk populations.

Through the AusAIDS' Australian Leadership Awards fellowships program, Burnet worked with the Nossal Institute to host seven Fellows from East Africa on a program looking at alcohol and other drug use and related harms. The Fellows were from Tanzania, Zanzibar, Kenya, Seychelles and Mauritius and **represented government departments** and civil society groups working with people who use drugs.

Burnet staff also worked with Harm Reduction International and the International Drug Policy Consortium to build the capacity of the Sub-Saharan African Harm Reduction Network through meetings in Beirut and Addis Ababa.

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2011 HIGHLIGHTS IN:

# Immunity, vaccines & immunisation



Vaccine and immunisation programs remain the **single most effective** strategies to guard against debilitating infectious diseases.

Scientific research projects within Burnet's Centres for Immunology and Virology, and public health programs operated by the Centres for International Health and Population Health, focus on **producing new vaccines**, researching disease patterns and testing new approaches to implement vaccination programs.

These **focus on urgent needs** to protect the world's most vulnerable populations from diseases such as malaria, polio, tuberculosis, hepatitis B and C, and HIV. **Burnet is also at the forefront** of new technologies to manipulate the immune system for the production of vaccines against non-infectious diseases such as cancer and arthritis.



③

① For the mother, the predominant consequences of malaria during pregnancy is maternal anaemia.

② Analysing blood samples shows us whether there are defects in the cells that are important for hepatitis C immunity in different patients.

③ Innovations like Uniject have made a significant contribution to the provision of immunisation services.



• **Vaccines and immunisation programs** remain the single most effective strategies.

• **Insights are gained from understanding the host immune response.**

## Immunity and Vaccines

Creating a vaccine to the hepatitis C virus (HCV) is challenging because of the virus' ability to **alter its appearance** to the immune system. The Centre for Virology's Associate Professor Heidi Drummer and Dr Pantelis Pountourios have made **exciting progress** in the development of a vaccine for HCV that affords protection against highly divergent strains. Their laboratory completed studies through a collaboration with CSL Limited to identify the optimal form of the major surface protein of HCV that affords protection. Supported with funding by an NHMRC project grant in 2012, they will further define the **lead vaccine candidate** and understand how the virus evades the immune system.

Further insights into the design of vaccines for HCV and other pathogens are gained from understanding the host immune response. The soluble factor interferon lambda is known to be **important in immunity** to HCV. The Centre for Immunology's Associate Professor Rose Ffrench and Dr Meredith O'Keefe, in collaboration with Professor Margaret Hellard from the Centre for Population Health, investigated how different cohorts of HCV-infected patients produce this factor and what specific cell types are involved. This will enable an analysis of whether there are defects in the cells that are important for HCV immunity in different patients.

Malaria research in the Centre for Immunology investigated the function of parasite proteins that may be **potential vaccine targets** and also analysed the immune responses in infected individuals from endemic areas. The Malaria Epidemiology Group, headed by Dr Freya Fowkes has focused on the anti-malarial **immune responses in pregnant women**, shedding new light on the course of disease in this highly susceptible group.

One of the biggest obstacles for producing an **effective vaccine against HIV** is knowing exactly what type of immunogen, a substance that stimulates production of a specific

antibody or of cellular immunity, will generate a broad neutralising antibody response. To address this issue, Associate Professor Paul Gorry and Associate Professor Melissa Churchill from the Centre for Virology are collaborating with the Centre for Immunology's Dr Paul Ramsland to **determine the 3-dimensional structure** of the HIV gp120 protein when bound to its CCR5 coreceptor. Having a clear view of these structures will provide a **critical 'missing link'** in HIV research and will accelerate the development of better HIV vaccines.

Work in the laboratories of Professor Suzanne Crowe and Associate Professor Anthony Jaworowski is determining **how the cellular immune system ages** in the setting of infection with HIV and other chronic diseases. This work has shown that increases in the number of CD16 positive monocytes in blood **defines normal healthy ageing** and provides new insights into the biology of the ageing process. Using this new biomarker of normal ageing these scientists, together with Dr Clovis Palmer, have shown that the immune system of young HIV positive individuals is ageing prematurely which is **predisposing them to illnesses** normally associated with older people such as cardiovascular disease and metabolic syndrome. These studies will identify those with HIV who may be at higher risk of developing other chronic illnesses.

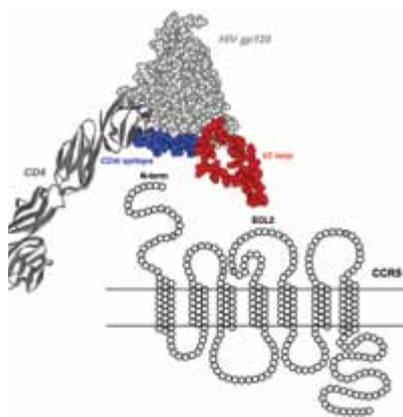
## Immunisation

Vaccination against hepatitis B within 24 hours of birth is proving challenging for many countries but is **critical to global control efforts** to prevent liver cancer (currently the fifth most common cause of cancer death) or liver failure. Burnet is supporting a new global hepatitis program, led by the World Health Organization and **demonstrating innovative means** to vaccinate newborns in Papua New Guinea (PNG).

Centre for International Health's Professor Mike Toole continued to support the final **worldwide push to eradicate polio** as a member of the

WHO's eight person Independent Monitoring Board for the Global Polio Eradication Initiative (GPEI).

Dr Chris Morgan was appointed to a new global WHO advisory committee (IPAC) that provides the organisation with expert advice on the **uptake of innovations** in the provision of immunisation services.



HIV researchers at Burnet continue to look for that critical 'missing link'. Here is an image of the gp120 protein bound to a schematic of the CCR5 coreceptor.

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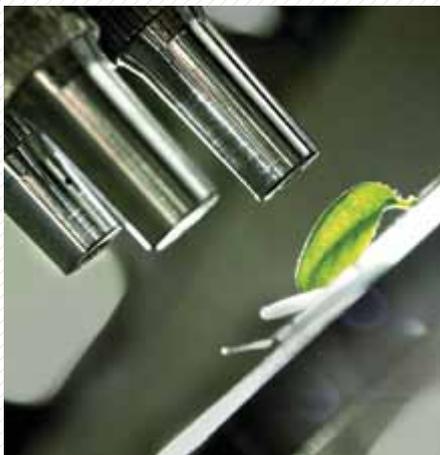
*Our unique fusion of medical research and public health allows us to develop solutions to particular health problems at any key point along the research to public health spectrum. To ensure the best utilisation of our expertise, knowledge and networks, and to best implement the diverse range of work within our themes, the Burnet Institute is divided into four Centres of expertise.*

## Introducing our four Centres



### Centre for Virology

*Within the Centre for Virology emphasis is placed on achieving innovative solutions for viral diseases of global importance. This is the foundation of our approach to research and public health practice.*

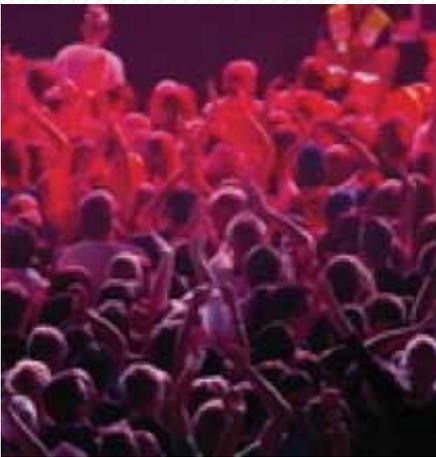


### Centre for Immunology

*The primary question for the Centre for Immunology is, why does the immune system attack some normal cells and ignore others that it should be destroying? Rheumatoid arthritis, lupus and several cancers are just some of the diseases we examine.*

- More than 1 billion malaria parasites are grown everyday at Burnet.

- 44,000 HIV education materials were distributed by our team in Tibet.



## Centre for Population Health

*The Centre for Population Health implements novel programs to better understand the enormous challenge of reducing the impact of infectious diseases and behaviours, particularly in highly vulnerable populations and disease endemic areas.*



## Centre for International Health

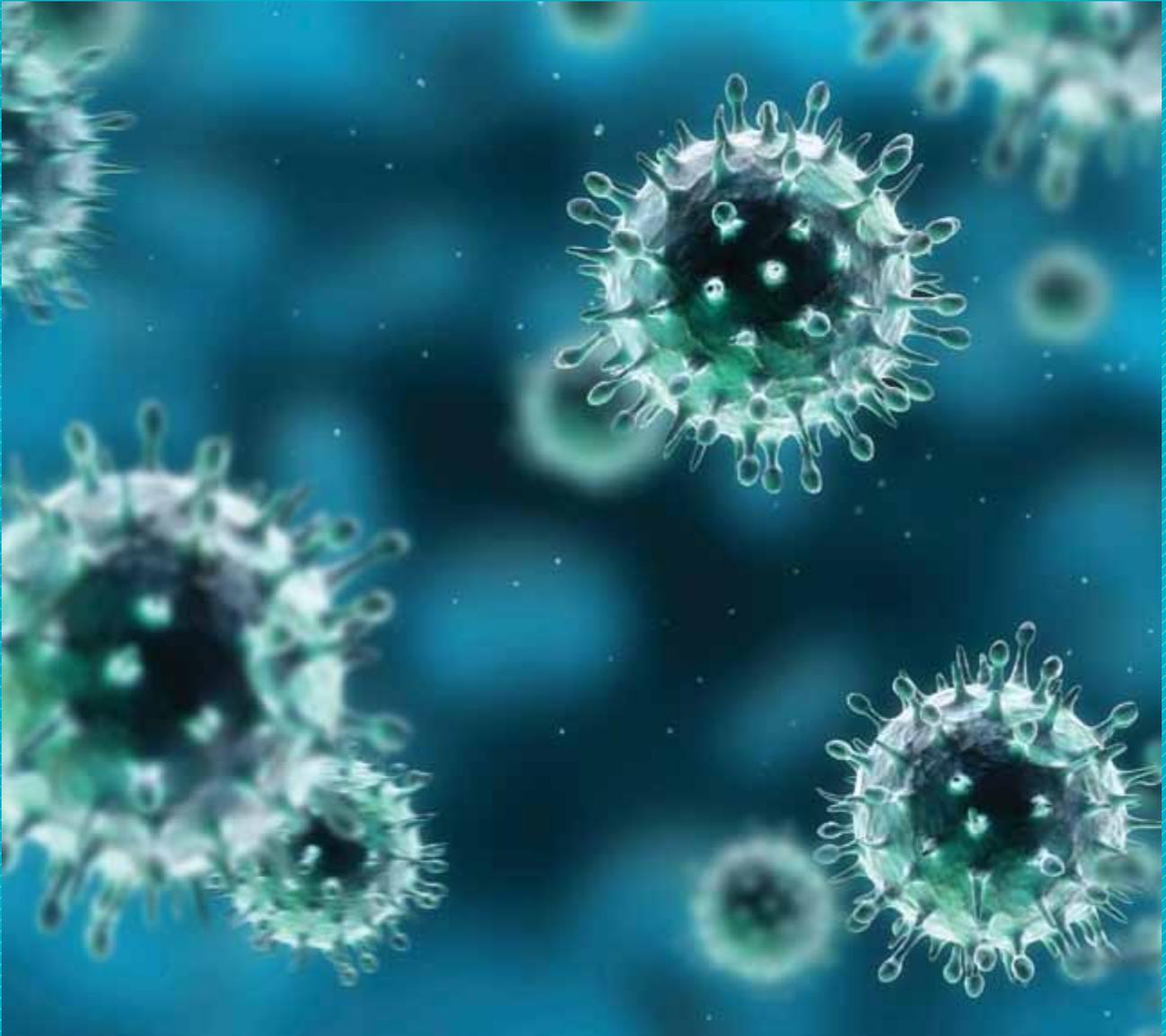
*The Centre for International Health responds to the complex issues surrounding major health problems in developing countries through innovation, inquiry and influence.*

*“Australian medical researchers are at the forefront of the fight against HIV. The Burnet Institute in Melbourne and the Kirby Institute in Sydney are just two of many medical research institutes where pioneering research into a cure is under way. When the cure and vaccine are found, we will hopefully be in the final phase of our fight against HIV.”*

**Hon Michael Kirby AC**  
Former Justice of the High Court of Australia, and  
Burnet Institute Patron

• We are also identifying possible new drug targets at the molecular level and developing diagnostic tools and point-of-care assays for chronic infectious diseases.

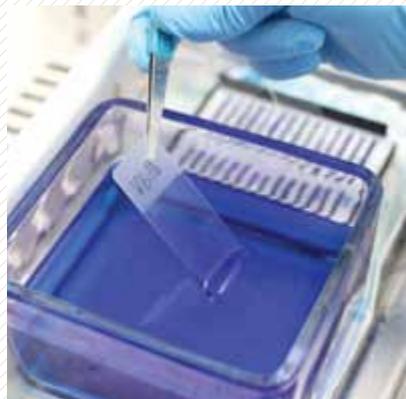
# Centre for Virology



*Achieving innovative solutions for viral diseases of global importance underpins the Centre for Virology's approach to research and public health practice.*



• *Virus research*



• *Basic research*



• *Students*

The Centre for Virology's main focus is the study of chronic viral diseases such as HIV, hepatitis B and C, and understanding how viruses manipulate their host cells in order to infect them and replicate within the body.

There is a strong emphasis within the Centre on basic research to facilitate the development of new drugs and new drug targets, as well as the technologies and diagnostics required to monitor treatments. These include the development of new drug resistance assays as well as developing appropriate diagnostic tools and point-of-care assays for use within resource-constrained countries.

We are also identifying possible new drug targets at the molecular level and developing diagnostic tools and point-of-care assays for chronic infectious diseases.

**Our research program is focused on:**

- *HIV neuropathogenesis*
- *Hepatitis immunovirology*
- *HIV pathogenesis and HIV reservoirs*
- *Point-of-care diagnostics and low-cost monitoring in resource constrained countries*
- *Retroviral biology and molecular pathogenesis*
- *Emerging infectious diseases – influenza*
- *HIV eradication, antivirals, treatment and prevention.*

**Our working groups:**

**Anderson Laboratory**

Accurate diagnostic techniques are a cornerstone of infectious disease control, yet there is an unmet need for

new and/or improved tests for many diseases that predominantly affect disadvantaged populations.

**Cherry Laboratory**

We aim to document the neurological problems and drug toxicities experienced by people living with HIV, understand the pathogenesis of these problems, and find ways of preventing and treating them better.

**Churchill Laboratory**

Our research into understanding how HIV infects cells of the central nervous system is pivotal to the development of strategies aimed at HIV eradication. This requires an understanding of HIV neuropathogenesis, development of viral reservoirs and characterisation of viral/host factors impacting on the central nervous system.

**Crowe Laboratory**

The focus of our lab is on developing and assessing laboratory monitoring tests for HIV infection, particularly low-cost tests that can be used in resource limited countries. The laboratory is also an accredited WHO Regional HIV Drug Resistance Laboratory for the Asia and Pacific regions.

**Crowe/Jaworowski Laboratory**

We study the pathogenesis of HIV infection with the aim of improving patient outcomes in the era of successful control of viremia with antiretroviral drugs.

**Drummer/Poumbourios Laboratory**

The Viral Fusion Laboratory examines how the hepatitis C virus attaches to and enters cells. Our objective is to find new targets for the development of antiviral agents and vaccine candidates.

**Gorry Laboratory**

We undertake research into understanding how HIV gains entry into cells of the immune system, with the overall aims of understanding HIV pathogenesis, developing new HIV inhibitors, and developing new diagnostics to assist physicians in treating patients.

**Gowans/Loveland Laboratory**

We undertake studies of the replication and virus assembly mechanisms used by hepatitis C virus, GB virus-B and dengue fever virus.

**Lewin Laboratory**

Headed by physician scientists, Sharon Lewin and Paul Cameron, the research focus is mainly on HIV, hepatitis B virus (HBV) and cytomegalovirus (CMV), and includes a wide range of health-related skill sets and backgrounds.

**Tachedjian Laboratory**

Our fundamental research approach is to understand the biology of retroviruses and to translate these findings into the discovery of new drug targets for antiretroviral therapy and prevention.

**Tannock Laboratory**

Research by our group is concerned with determining the causes of variability in the growth of influenza B viruses in eggs, and in developing methods to increase yields of vaccine antigens.

**Wright Group**

We are committed to improving health in the Asia and Pacific regions, through extensive training programs and research studies on HIV clinical management and neurological complications of HIV, nationally and internationally.

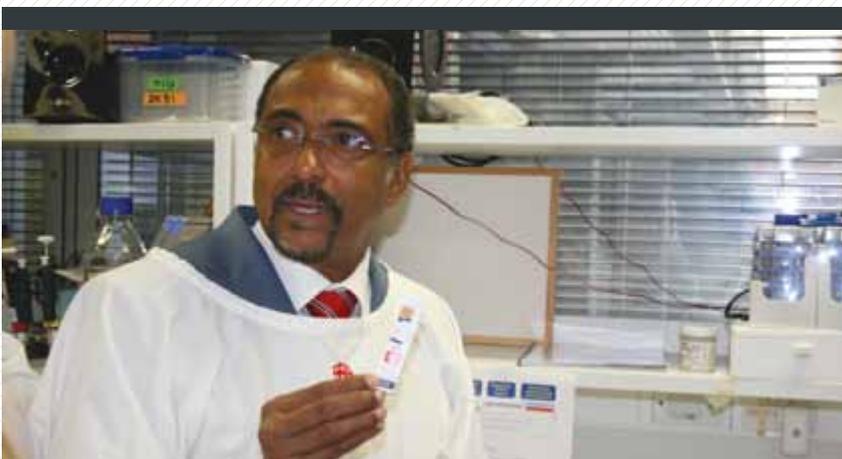


### Lewin Laboratory

In July 2011, the National Institutes of Health (NIH) awarded USD\$70 million over five years for work towards a cure for HIV. Three large programs were funded as part of the Martin Delaney Collaboratory initiative. Professor Lewin is a project leader of one of the collaboratories, called the Delaney AIDS Research Enterprise (DARE), which received USD\$23 million to find a cure. The other DARE co-investigators include Steve Deeks and Mike McCune (UCSF), Rafick Sekaly (Vaccine Gene Therapy Institute, Florida), Sarah Palmer (Karolinska Institute, Stockholm), Daria Hazuda (Merck) and Mario Stevenson (University of Miami). The goal of the program is to use immune-based approaches to eliminate latent HIV infection from patients receiving anti-HIV drugs. The team will evaluate new approaches using laboratory models of HIV latency, monkeys infected with simian immunodeficiency virus (SIV) and HIV-infected patients receiving long-term anti-HIV drugs. Professor Lewin's group will explore the role of chemokines in HIV persistence. They will determine if latently infected cells in people can be identified by unique markers on the surface of the cell. Her group will evaluate the anti-latency potency of novel drugs developed by the collaboratory using a new laboratory model.

### CD4 Test Development (NHMRC Development Grant) featured as one of '10 of the best' NHMRC projects in the selection of completed grant-funded projects for 2011

HIV-infected patients must have their levels of CD4 T-cells measured on a regular basis, with a count of less than 350 T-cells per cubic millimetre being the signal for starting antiviral therapy. Since 2005, we have been working to develop a simple, rapid point-of-care test as an alternative to the expensive and poorly accessible CD4 tests such as flow cytometry with support from the Doris Duke Charitable Foundation, the CD4 Initiative (Imperial College London, funded by the Bill and Melinda Gates Foundation), a Development Grant from the NHMRC, and the Medical Research and Commercialisation Fund. Evaluations of the prototype CD4 test device in our Diagnostics Development Laboratory and at an independent test site show excellent performance, and we are actively pursuing commercial partnerships. This project was recognised as one of the '10 of the Best' completed NHMRC projects from 2010. The support for both Associate Professor David Anderson and Professor Suzanne Crowe through their NHMRC Fellowships has also been a critical factor in our ability to succeed with this long-term project, together with the dedication of our lab team led by Mary Garcia.



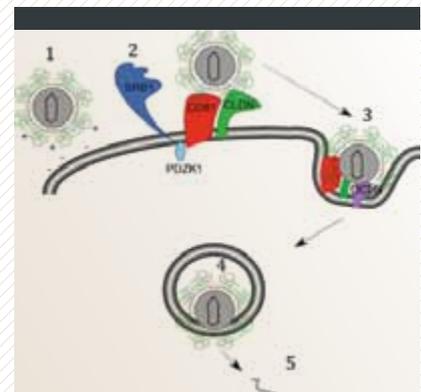
Mr Michel Sidibé, Executive Director UNAIDS and Under Secretary-General of the United Nations, takes an interest in the CD4 diagnostic kit on his visit to the Institute in 2010.

### Retroviral biology and antivirals

The Tachedjian Laboratory undertakes fundamental research to understand the biology of retroviruses including HIV and the role of host cell factors in retroviral replication. They also study the role of HIV mutations selected during antiretroviral therapy in drug resistance and viral fitness, and perform translational studies to identify, determine the mechanism of action, and develop novel agents for the treatment and prevention of HIV and other sexually transmitted infections.

### Progress in understanding the mechanism of HCV entry

Hepatitis C virus glycoproteins mediate attachment to liver cells and viral entry. Although our understanding of the receptors that are required for HCV has advanced, relatively little is known about the structure of the viral glycoproteins prior to and during viral entry. Recent findings from the Viral Fusion Laboratory, led by Associate Professor Heidi Drummer and Dr Andy Poubourios, reveal for the first time that the viral glycoproteins present on virions must be in a reduced state prior to attachment to cells and transition to an oxidised state after attachment (Journal of Biological Chemistry 2011, v286, 31984-92).



The stages of HCV entry: 1) attachment to surface of liver cells; 2) attachment to specific liver cell surface receptors; 3) endocytosis; 4) fusion; 5) replication.



*iCRL and Alfred hospital staff providing training in HIV laboratory monitoring and patient management to laboratory technicians, nurses and pharmacists in India.*

### Tackling HIV latency: towards a cure for HIV

Dr Suha Saleh and Dr Paul Cameron from the Lewin Laboratory have pioneered a novel method to study HIV latency in the test tube. In collaboration with scientists from our Centre for Virology, Westmead Millennium Institute in Sydney, and the Vaccine and Gene Technology Institute in Florida, they identified the pathways that are activated by proteins called chemokines that lead to the establishment of latency. The laboratory is now using this model to identify new targets to block and reverse HIV latency.

### Improving treatment for HIV infected individuals

HIV-infected individuals have a shorter life expectancy and increased non-AIDS-related morbidities even in the setting of virological suppression following treatment with combinations of potent antiretroviral drugs. The HIV Pathogenesis Laboratory, led by Associate Professor Anthony Jaworowski, aims to understand the mechanisms of dysregulation of the innate immune system that leads to increased morbidity and mortality in these patients.

### Hosting international clinicians and students to transfer technology for HIV-1 drug resistance testing

Burnet's Clinical Research Laboratory/WHO Regional Reference Laboratory for HIV Resistance Testing develops and validates affordable methods for drug-resistance testing for use in resource limited settings, performs surveillance testing for countries without established testing, and initiates field research. We strengthen regional laboratories and provide hands-on training at Burnet or in-country. In 2011, a medical student from Botswana, a PhD student from Papua New Guinea, a Malaysian medical microbiologist and laboratory technicians in India were trained.

### Improving the yield of Influenza B Virus

Most vaccines, including the seasonal influenza vaccine, are prepared by growing viruses in fertilized chicken eggs. While the process for growing influenza A viruses is relatively straight forward, for reasons not entirely understood, the same method is not as effective when trying to grow strains of influenza B virus.

Influenza B comprises one-third of each seasonal influenza vaccination and as such it is important for manufacturers that they can grow predictable amounts of the virus.

Ms Hyunsuh Kim, from the International Vaccine Institute in Seoul, is undertaking a PhD project at Burnet with Professor Greg Tannock to address problems associated with the influenza B component of vaccines caused by low-yields. Ms Kim's research is being supported by a grant from CSL Ltd.

### Enabling women to protect themselves against HIV

In collaboration with the Australian biotechnology company Starpharma Pty Ltd, the Tachedjian Laboratory have been undertaking the preclinical evaluation of dendrimer microbicides for the inhibition of HIV and genital herpes.

These studies have identified a fourth-generation dendrimer, SPL7013, as the most potent in blocking HIV and genital herpes in cell culture tests, achieving a broad-spectrum activity against different HIV strains and herpes virus (HSV). In 2011, Starpharma and the Tachedjian laboratory published results for a study investigating VivaGel®, a topical gel containing SPL7013, in healthy women. This study found that VivaGel's® antiviral activity against HIV and HSV was sustained in cervico-vaginal samples for at least three hours post application in all women, and up to 24 hours in 50 per cent of participants.

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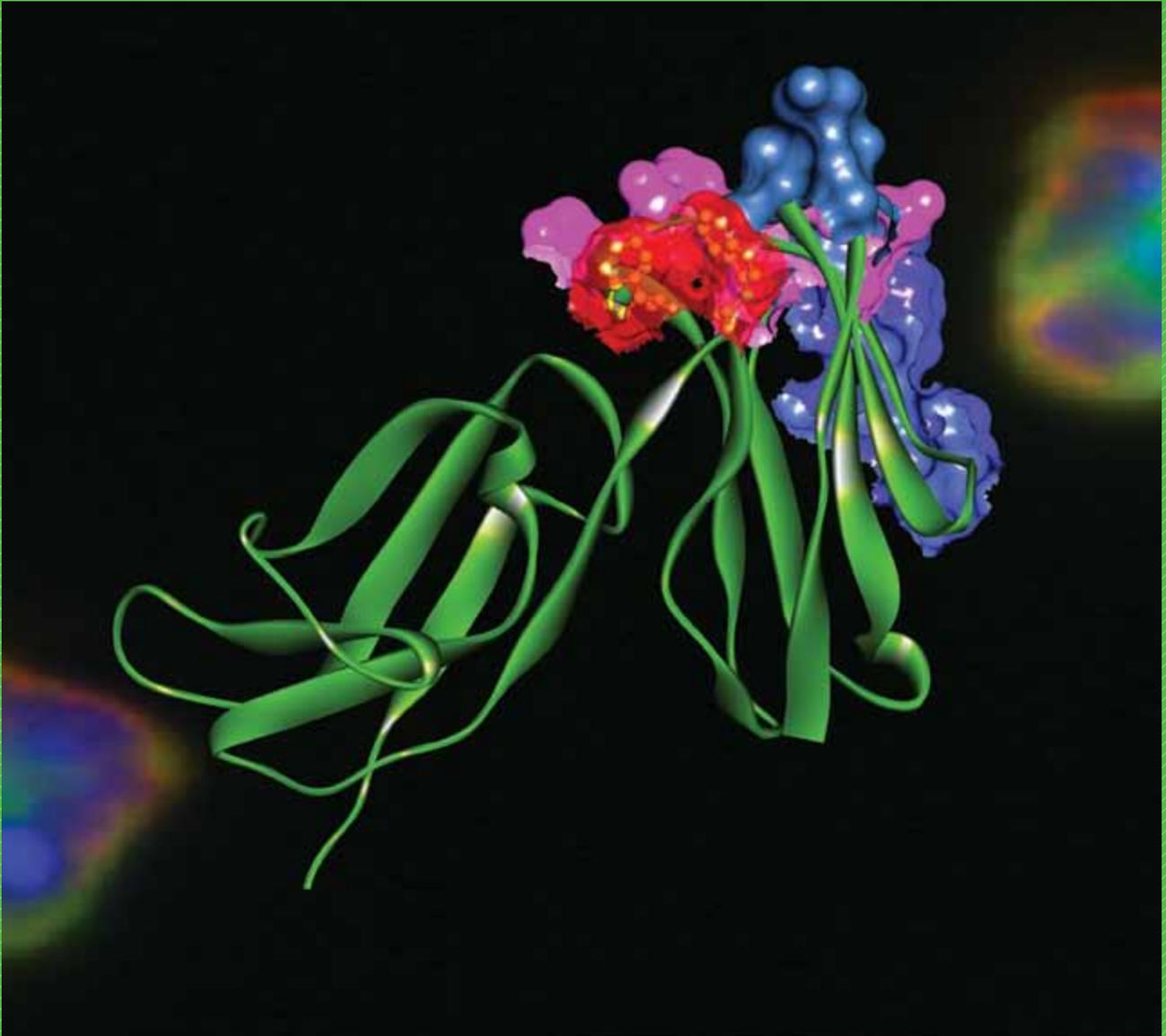
#### Professor Suzanne Crowe AM

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• Our research asks – why does the immune system attack some normal cells and ignore others that it should be destroying?

# Centre for Immunology



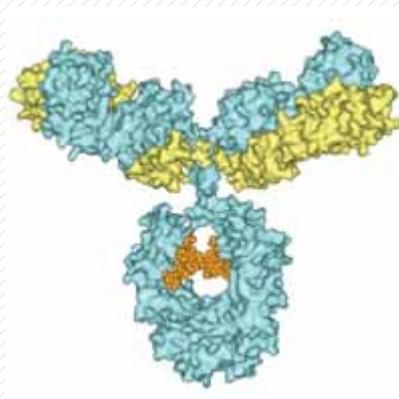
*Developing novel ways to prevent or treat major infectious diseases, autoimmune and inflammatory diseases, and cancers underpins our research approach. The Centre for Immunology integrates fundamental and applied research programs to understand the way the immune system functions in health and disease. This knowledge is used for the development of new treatments, vaccines, and diagnostic tests for major human diseases.*



• Peer-reviewed science



• Opportunities



• 3D structures

The Centre for Immunology combines research on biological mechanisms involved in the development of important human diseases, discovering new ways to treat or prevent major diseases, and understanding fundamental processes in the function of the immune system. This is addressed through innovative and multidisciplinary research that encompasses laboratory-based research, clinical studies of human disease, and research at the population level. Key aims include understanding how the immune system attacks or clears infectious agents, why the immune system attacks normal cells it should ignore in autoimmune diseases, and how infectious agents and cancer cells avoid immune destruction.

**Our research program is focused on:**

- *Malaria and other infectious diseases*
- *Autoimmune and inflammatory diseases*
- *Vaccines for infectious diseases and cancer*
- *Immune function in health and disease*
- *Structural biology.*

**Our working groups:**

**Bio-Organic and Medicinal Chemistry (Pietersz Laboratory)**

Designing novel vaccines for cancer and major infectious diseases is the focus of our work.

**Dendritic Cell Receptors (Lahoud Laboratory)**

Our research is currently focused on characterising the molecular interactions that underpin Clec9A function, the role of these interactions in mediating immune responses, and the potential of targeting Clec9A for immune therapy.

**Dendritic Cell Research (O’Keeffe Laboratory)**

Dendritic cells are sentinels of the immune system. Our goal is to understand how these cells are activated by pathogens and other signals and to harness this knowledge to address problems in human disease.

**Dendritic Cells in Innate and Adaptive Immunity (Caminschi Laboratory)**

Improving vaccines by targeting dendritic cells is one key focus of our research. We know that potent immune responses can be induced by targeting antigens to surface receptors on dendritic cells (DC).

**Diagnostics Development Laboratory (Anderson Laboratory)**

There is an unmet need for new and/or improved tests for many diseases that predominantly affect the disadvantaged. Our work aims to develop new diagnostics tests to improve the management and control of important diseases.

**Immunology and Cancer Vaccines (Hogarth Laboratory)**

Understanding how the immune system responds to cancer cells and developing effective vaccines to treat cancer and infectious diseases is the focus of our research.

**Inflammatory Diseases and Infection (Hogarth Laboratory)**

We aim to understand the cellular and molecular basis of inflammation and translate this knowledge into developing new immunomodulatory therapeutics for autoimmune diseases and infection.

**Leukocyte Development in Health and Disease (Gavin Laboratory)**

Our work aims to understand how responses by the immune system can lead to the development of autoimmune diseases.

**Lymphocyte Biology Group (Gugasyan Laboratory)**

Our lab aims to understand how the immune system responds when subjected to various external factors that promote the differentiation of immune cells.

**Malaria Epidemiology Group (Fowkes Laboratory)**

More than two billion people live in malaria endemic areas. Understanding malaria dynamics in populations is key to implementing effective public health control measures as we strive towards the ultimate goal of malaria elimination.

**Malaria Research (Gilson/Crabb Laboratory)**

Resistance to mainstream anti-malarial drugs is now widespread. Our work aims to identify new targets and approaches for malaria drugs and vaccines.

**Malaria Immunity, Vaccines and New Therapies (Beeson Laboratory)**

Our work focuses on understanding immune responses to malaria and how malaria disease develops, particularly in children and pregnant women, and to use this knowledge in the development of malaria vaccines and new drugs.

**Structural Immunology Laboratory (Ramsland Laboratory)**

Examining the three-dimensional (3D) structures of proteins of the immune system and how this influences their function is our key research focus.

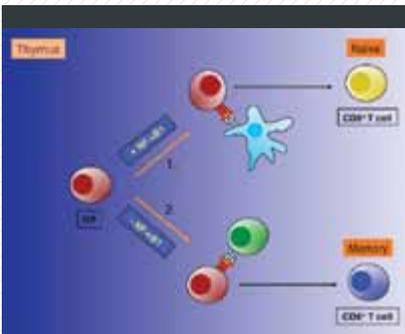
**Viral Immunology (Ffrench Laboratory)**

Our aim is to gain a clearer understanding of the nature of cellular immune responses to viral infections to aid the development of new vaccines and immunotherapies.



**A unique role for nuclear factor-kB1 (NF-kB1) – Dr Raffi Gugasyan**

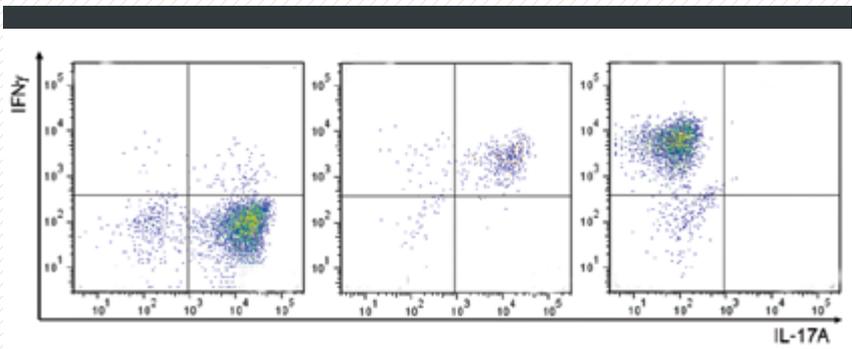
A major goal of immunological research is to enhance the formation of long-lived memory T-cells. Pathogenic infections or cancer therapy can leave individuals severely immune-compromised. This has prompted the need to develop novel strategies to enhance immune function, including the development of T-cell memory. Our research has identified a unique role for a regulatory protein, Nuclear Factor-kB1 (NF-kB1), whereby blocking the function of NF-kB1 promotes the development of CD8+ T-cells with memory characteristics. The thymus is the primary site for the production of naïve T-cells. However, thymuses from mice that lack the gene for NF-kB1 produced a unique population of CD8+ T-cells that resemble and function like memory cells. This unexpected finding highlights the importance of NF-kB1 as a major regulator of memory T-cells. Future research will focus on understanding the biological role of NF-kB1 and how the loss of this protein promotes long-lived CD8+ memory T-cells. These findings provide important insights into the development of new therapeutic strategies aimed at targeting NF-kB1 for enhancing T-cell memory responses against pathogenic infections or cancer.



The schematic above highlights the novel role of the regulatory protein NF-kB1. During normal T-cell development in the thymus, NF-kB1 (+ NF-kB1; pathway 1) ensures that immature T-cells interact with stromal cells (blue) to become naïve CD8+ T-cells. In the absence of NF-kB1 (- NF-kB1; pathway 2), a population of immature T-cells interact with non-stromal cells (green) and acquire memory characteristics.

**A better understanding of how antibodies signal inflammatory cells – Professor Mark Hogarth and Dr Bruce Wines**

Antibodies are the body’s blood proteins and are ‘natural drugs’ that normally protect against infection by neutralising microbes and their toxins. Unfortunately they can also cause inflammation resulting in tissue destruction in diseases such as rheumatoid arthritis and lupus. This year we made several exciting discoveries. Firstly, we now understand how antibodies signal inflammatory cells and ‘trigger’ inflammation in autoimmune disease through a cell membrane called Fc receptor. Secondly, we have discovered how microbes, such as a *Staph aureus* avoid being neutralised by the mucosal antibody called IgA. We also discovered a link between cancer and inflammation, and finally, together with the CRC for Biomarker Translation, we have discovered new biomarkers of human cells such as inflammatory Th1 and Th17 cells. Thus we increasingly understand how antibodies activate the immune system to protect the body or how they unfortunately cause injury in autoimmune disease allowing us to develop new effective therapies for diseases including arthritis, lupus, cancers and infection.



The image above identifies inflammatory white blood cells, T-cells, by detecting cytokines which are the active hormones that they produce; each dot in the plots below represents one T-cell. Different specialised T-cells were isolated from patients and identified by the cytokines they make. For example: Th17 cells (left panel) make a special cytokine called interleukin-17, IL-17 but not interferon, IFNγ, whereas Th1 cells (right panel) make IFNγ but not IL-17, however, poly functional Th cells make both (centre). By isolating and then analysing these different cells we develop new approaches to anti-inflammatory therapy such as therapeutic monoclonal antibodies aimed at selectively eliminating the Th17 or Th1 cells in patients.

**Computational modelling results in several high profile primary research papers**

The **Ramsland Laboratory** used small-angle scattering techniques to determine solution structures of immune system glycoproteins and pathogen proteins. Mariel Bartley used the Australian Synchrotron to visualise IgM (an important class of antibody) in collaboration with Dr Cy Jeffries and Professor Jill Trehwella (University of Sydney). This year our computational modelling of glycoprotein-mediated virus (HIV) entry into immune cells resulted in several high profile primary research papers in collaboration with the Centre for Virology’s Gorry, Churchill, Tachedjian and Pountourios laboratories.

**Understanding the ‘export machine’**

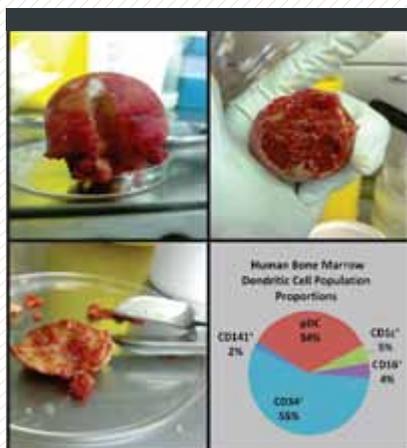
The extreme virulence of malaria parasites is largely due to their ability to grow rapidly and to avoid the human immune system. The parasites achieve this by extensively renovating the red blood cells in which they grow by exporting hundreds of their own proteins into them. The **Crabb/Gilson Laboratory** recently discovered the molecular machinery that acts as a gateway for protein export and made significant progress in understanding when and how the export machine is assembled. The export machine could make an excellent drug target since hundreds of parasite proteins rely on it to function properly.

### Tolerance mechanisms in Crohn's disease – exciting results

The **Gavin Laboratory** is studying immune tolerance mechanisms. Normally, self-reactive immune cells are removed or controlled in a process known as tolerance. In Crohn's disease, the immune system appears to attack the gut and the bacteria within it. We have exciting results indicating that important tolerance mechanisms are abnormal in mice lacking NOD2, a gene found to be defective in patients with Crohn's disease. This helps us understand what goes wrong in this crippling disease.

### What type of dendritic cells are present in the bone marrow?

There is little information about the dendritic cells (DC) of the bone marrow, yet this bone marrow DC likely plays an important role in viral infections, particularly in immunosuppressed patients. This year the **O'Keefe Laboratory** has made great progress in understanding what types of DCs are present in the bone marrow. In addition, we have further characterised the production of the anti-viral hormone IFN-lambda, finding that its production by DCs varies greatly in different organs and that it likely plays a role in various autoimmune diseases.



Extraction and characterisation of dendritic cell subsets present in human bone marrow. Sample is a femoral head from the surgical discard.

### Developing new assays to assess the production of IL-28 by ELISA

The influence of genotype on the outcome of hepatitis C virus (HCV) infection was examined in a project funded by ACH2 to determine if IL-28 production could be used as a prognostic marker. This included developing new assays to assess the production of IL-28 by ELISA and the frequency and phenotype of IL-28 producing cells by ELISPOT. Two students, Jeff Smith and Shane Licheni, conducted this project in the **Ffrench Laboratory** with assistance from Kylie Goy and Devy Santoso.

### The Bill and Melinda Gates Foundation funds progress on a candidate HIV gag MicroCube vaccine

Continued funding from the Gates Foundation allowed the **Ffrench Laboratory** to further develop and test a candidate HIV gag MicroCube vaccine. This vaccine has proven to be very stable and not sensitive to degradation by heat or proteases, making it attractive for use in developing countries. We are working on including further HIV proteins to elicit neutralising antibodies. This project has been conducted in collaboration with Dr Fasseli Coulibaly's group at Monash University, with the experimental work in the Ffrench lab performed by Dr Amanda Brass.

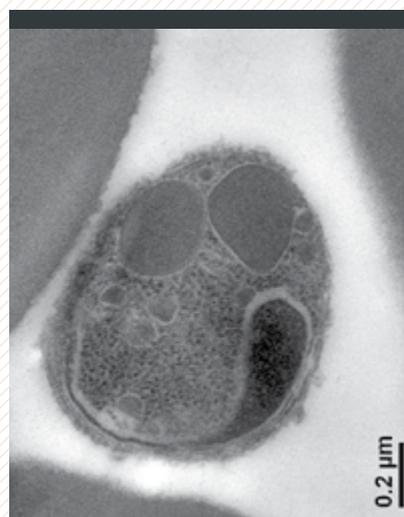
### Using chemical methodology to design novel drug and vaccine delivery systems

The **Pietersz Laboratory** is involved in the design of novel drug and vaccine delivery systems based on chemical methodology. Membrane translocating peptides from a fruit fly were successfully used to deliver multipartite peptides incorporating synthetic tumour antigens to immune cells to stimulate anti-tumour responses in mice. Currently, anti-cancer drugs are not specific to cancers and result in

dose-limiting side effects. To increase selectivity of these drugs we have used novel strategies to link anti-cancer drugs to anti-breast cancer antibodies that target breast cancers. These drug-antibody conjugates are specifically toxic to cancer and not normal cells.

### Malaria Immunity, Vaccines, and New Therapies

A major focus of the work in the **Beeson Laboratory** is on understanding immunity to malaria in humans and using this knowledge towards the development of malaria vaccines. Young children and pregnant women are the two groups at greatest risk of malaria and its severe consequences. Our work has made important progress in the development of several candidate malaria vaccines by providing insights into how these vaccines work against malaria, and how to address the ability of malaria infections to avoid or dodge immune responses.



The image above is of a malaria parasite (ovoid-shaped cell in the centre) attached to a human red blood cell (left). Malaria parasites must attach to human red blood cells before infecting them.

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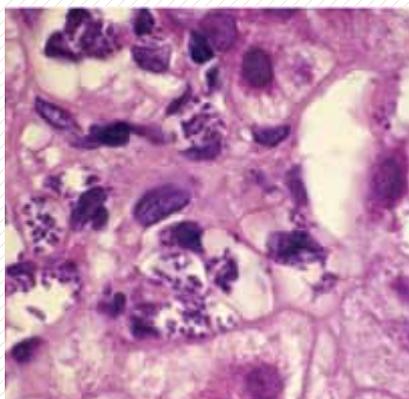


*The Centre for Population Health implements novel, multidisciplinary scientific programs.*

# Centre for Population Health



*We aim to improve the health of the community by conducting high quality, innovative research that addresses the major public health problems associated with infectious diseases and drugs and related behaviours.*



• Hepatitis C



• Health promotion



• Peer education

*HIV, hepatitis C, sexually transmitted infections, malaria, tuberculosis and drug and alcohol use are serious health concerns in Australia and the Asia and Pacific regions. It is an enormous challenge to reduce the impact of these diseases and behaviours, particularly in highly vulnerable populations and disease endemic areas.*

The Centre for Population Health implements novel, multidisciplinary scientific programs that use cutting-edge epidemiology, high quality laboratory science, excellent clinical and social research, and strong public health principles to address these major health problems in our region.

The broad spectrum of work ranges from research that helps to better understand the priority diseases and their transmission and ecology, to discovery science with potential for longer-term benefits such as therapeutics and vaccines, to health systems oriented research that directly influences health policy.

### Our working groups:

#### Alcohol and Other Drugs

A major public health issue especially amongst young people, alcohol and other drug use costs Australia an estimated \$55 billion a year. Our group studies the nature and extent of the problem with a view to developing effective policy responses.

#### HIV and Sexual Health

Notifications of HIV and other sexually transmitted infections (STIs) have been on the rise for the past decade. This group conducts innovative research aimed at understanding the transmission and prevention of these infections.

#### International Health Research

This group combines basic laboratory research, field-based research and epidemiology to understand infectious diseases of global significance, with a particular focus on malaria and tuberculosis.

#### Justice Health

Both in Australia and internationally, prisoners and ex-prisoners struggle with poverty, poor physical and mental health, and tobacco, alcohol and other drug problems. This group undertakes research to build the evidence base for policy and practice.

#### Malaria Epidemiology

More than two billion people live in malaria endemic areas. Understanding malaria dynamics in populations is key to implementing effective public health control measures as we strive towards the ultimate goal of malaria elimination.

#### Surveillance and Evaluation

This group manages HIV and other STI surveillance systems and conducts evaluations of projects and programs aimed at understanding the transmission and prevention of communicable diseases and the health of affected populations.

#### Viral Hepatitis

The work in our group focuses predominantly on hepatitis C virus (HCV), aiming to improve the understanding of the virus, to develop harm reduction strategies for populations at greatest risk, and ultimately to develop a vaccine.

#### Young People's Health

This group focuses on work examining the epidemiology and consequences of risk behaviours among young people both in the general population and those who are more vulnerable or marginalised.



### Centre for Research Excellence: Reducing the health, social and economic burden of injecting drug use in Australia

The NHMRC-funded Centre for Research Excellence in Injecting Drug Use (CREIDU) based in the Centre for Population Health brings together Australia's leading researchers on injecting drug use (IDU), along with partners and key experts from the non-government sector and policy sectors, to generate new evidence on ways to improve the health and social burden of IDU.

In 2011, CREIDU held its inaugural colloquium featuring Professor Thomas Kerr from the British Columbia Centre for Excellence in HIV/AIDS as the keynote speaker presenting 'Harm Reduction in Vancouver, Canada: Responding to a Public Health Emergency'. With an interactive format and exciting mix of Australian and international speakers the Colloquium drew together more than 100 participants including researchers, affected communities, policymakers and practitioners to discuss key research and public health issues and their implications for policy and practice. Four key themes were explored: evolving and improving management of hepatitis C treatments in people who inject drugs, linkages between drug use and mental health, improving response to overdose with peer-delivered naloxone programs, and managing the injecting environment including contentious issues of safe injecting facilities and vending machines.



CREIDU aims to generate new evidence on ways to improve the health and social burden of injecting drug use.

### A prospective cohort study of ex-prisoners with a history of injecting drug use

Prison populations are characterised by high levels of injecting drug use, blood-borne virus infection and poor physical/mental health. Although prisons and community transition offer opportunities to address these health issues, intervening effectively at these crucial points is limited by a poor understanding of the trajectories of people who inject drugs (PWID) during and after they transition to the community. In 2011 Dr Mark Stoové and colleagues were rewarded an NHMRC project grant to study, that will aim to identify the typical trajectories of PWID released from prison, and determine risk and protective factors for PWID in the health, social and criminal justice domains. Dr Stoové will recruit 600 PWID pending release and conduct baseline interviews and collect blood shortly prior to release, with follow-up at three, 12 and 24 months post-release. This data will be augmented with extensive record linkage with health and justice databases. The study will provide insights into the complex relationships between incarceration, drug use, physical/mental health, service access and recidivism. Findings will inform the policy and services for this high-risk population and help prevent ongoing morbidity and recidivism.



The study of post-release prisoners will provide insights into the complex relationships between incarceration, drug use, physical/mental health service access and recidivism.

### Evaluation of condom distribution trial in Victorian prisons

After considerable advocacy, research and encouragement by many organisations, including the Burnet Institute, condoms and dental dams have been introduced into Victorian Correctional facilities as a pilot program. The Centre for Population Health has been commissioned by Justice Health to evaluate the pilot program using a combination of qualitative and quantitative methods. An examination of barriers to implementation positive and adverse outcomes during this pilot stage will inform the roll-out of condoms and dental dams to the remaining Victorian prisons in 2012.



Advocacy and research by many organisations, including Burnet, now sees condoms and dental dams being introduced into Victorian prisons.

### Mapping sexual and social networks of men who have sex with both men and women in Laos and Vietnam, countries with concentrated HIV epidemics

Undertaken in collaboration with the Centre for International Health, this highly innovative project explored the sexual relationships and practices of men who have sex with both men and women in Vientiane in Laos, and Hanoi in Vietnam. People were recruited in three waves for each site. The study results will inform our understanding of the potential for HIV transmission between heterosexual, homosexual and bisexual networks in these two populations to inform HIV prevention practice.

### Naloxone for heroin overdose treatment

Naloxone is an important tool in reducing heroin overdose. In 2011, The Centre for Population Health was involved in the Enhancing Naloxone Availability in ACT (ENAACT) Committee that has worked to facilitate a rollout of Naloxone to friends and families of people who inject drugs in the ACT. This work culminated in the official launch of the program by the ACT Chief Minister in December. Burnet's Centre for Population Health was also directly involved in the background work for a new randomised controlled trial of the effectiveness of intranasal Naloxone for the treatment of heroin overdose that will be implemented at the Sydney Medically Supervised Injecting Centre in 2012.

### The Melbourne Injecting Drug User Cohort Study (MIX)

MIX is a study of almost 700 people who inject drugs. Established in 2009, the study aims to examine the health and social outcomes for people who inject drugs (PWID) in Melbourne. In 2011, the study moved into the second and third follow-ups of participants that will be augmented by linkage to health service records in 2012.

### Immunity to malaria during pregnancy

The Malaria Epidemiology Group has performed the largest, most comprehensive, immunological analysis of the acquired immune response to a pathogen during pregnancy to date. They found that women exposed to malaria were able to mount an immune response, maintain it throughout pregnancy, and to boost responses upon re-exposure to a pathogen. These findings are not only important for the field of malaria but are also applicable to all infectious diseases and positively contribute to the understanding of the immune response to infectious diseases throughout pregnancy.



*Burnet's study aims to identify patterns of drinking and drug use in public spaces.*

### Public drinking and drug use in the Footscray CBD

In spite of much public concern, very little research has been conducted on public drinking and drug use. Based in the Footscray CBD, this study aims to identify patterns of drinking and drug use in this public space, including gaining an understanding of the reasons people drink and use drugs in these spaces, their social groups and experiences of others' use of alcohol and drugs. The study results will inform our understanding of public drinking and drug use so that responses and policies can be devised to better serve everyone who uses these spaces.

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• We respond to complex health issues  
with innovation, inquiry and influence.

# Centre for International Health



*The Centre for International Health (CIH) responds to health problems in developing countries through the provision of technical advice and support, organisational capacity-building, applied research, policy analysis and development, and education and training programs.*



• Children's health



• Immunisation



• Training

The Centre for International Health's expertise spans HIV prevention and care, women's and children's health, sexual and reproductive health, drug use, primary health care, strengthening national health systems, and education across these fields. Innovation, inquiry and influence underpin our public health approach.

Working closely with communities, civil-society organisations, governments, international non-government organisations, and UN agencies, we can respond effectively to local health issues.

### Our working groups:

#### Education and Capacity Development

The Education and Capacity Development group is responsible for the oversight, development and strategic direction of the Centre for International Health's education, training and capacity development programs in Melbourne and overseas.

#### HIV and Harm Reduction

Our focus is to provide technical assistance, strategic direction and quality oversight of international HIV and harm reduction initiatives.

#### Infectious Disease and Health System Strengthening

Malaria and tuberculosis (TB) are preventable infectious diseases and are the main target of our prevention and control activities. We support our partners in each country using technologies from 'bench to the bedside' through basic science, clinical and social research.

#### International Operations

A team of locally based country representatives are supported by public health project managers in Australia to implement our country programs which aim through practical action to improve the health for people in low-income communities.

#### Women's and Children's Health

This group implements programs to improve the health of women and children in a way that strengthens the capacity of individuals and health systems in country.

The Centre for International Health has a five-year strategic plan with priorities that guide public health responses internationally. Activities in the technical areas are prioritised in the countries where Burnet has a presence (see list to the right).

These priorities have been developed with due consideration of the expressed country priorities as determined in 2011 as well as external and global trends. They address technical themes as apparent in the list of working groups. In addition, CIH is engaged in programs that promote healthy ageing. This focus provides general guidance on technical and resource allocation.

In 2011, the Centre for International Health maintained long-term staff in seven countries.

- Myanmar (Burma)
- Papua New Guinea
- Lao PDR
- Indonesia
- Mozambique
- Tibet/China
- Thailand

In addition, the Centre for International Health maintained an active interest in Southern and Eastern Africa, Timor-Leste, Melanesia (Vanuatu, Solomon Islands), Cambodia, Vietnam, Nepal, Sri Lanka, and Afghanistan/Pakistan.



### Expanding our work in Papua New Guinea (PNG)

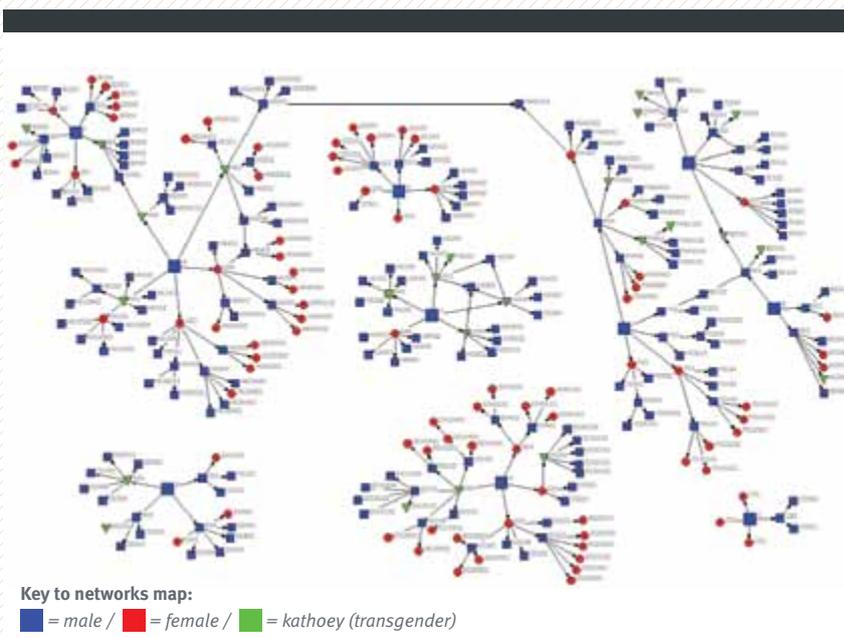
The significant expansion of our work in Papua New Guinea (PNG) has involved each of the Centres of the Institute. The AusAID-funded East New Britain Sexual Health Improvement Project works through the provincial health system to improve clinic management of sexually transmitted infections and through community mobilisation to increase demand for services. Several studies are exploring male involvement in antenatal care to help reduce parent-to-child transmission of HIV. Through a Global Fund grant, Burnet is helping to strengthen the capacity of the Central Public Health Laboratory to conduct antiretroviral drug resistance testing.

Operational research continued its focus on improving services delivered by Village Health Volunteers and the feasibility of delivering birth-dose hepatitis B vaccination and early postnatal care in remote villages in East Sepik Province. Studies are also being done on the molecular epidemiology of malaria and the development of immunity to malaria in children and pregnant women. We have expanded our efforts to build local capacity in research on drug and alcohol harm reduction. We have worked closely with colleagues in national institutions, such as the Institute for Medical Research, the University of PNG, and the National Research Institute, as well as NGOs such as World Vision, CARE Australia and Save the Children.

### Mapping sexual networks

A landmark study to map the sexual networks of men who have sex with both men and women in Vientiane and Hanoi was completed. This was a collaboration between Burnet's Centres for International Health and Population Health. While this modelling method has been used to map networks of people who inject drugs and the clients of sex workers, we believe that this is the first such study of bisexual men. HIV prevalence among men who have sex with men in Vientiane and Hanoi is much higher than among adults in the general population. Men who report sexual contact with women and men and/or transgender people may constitute a bridge between 'high-risk' and 'low-risk' populations for transmission of HIV and other sexually transmitted infections.

Both studies generated a rich set of qualitative data about beliefs and attitudes to sexuality, sexual identity, gender, and sexual health of these men. Men who engage in bisexual behaviour do so for a range of diverse reasons that does not always reflect their primary sexual orientation. In both cities, bisexual men had higher numbers of both female and male partners than men who were exclusively homosexual or heterosexual. Moreover, bisexual men were less likely to use condoms than other men. The following figure represents the sexual network map in Vientiane, Lao PDR.



A sexual network map in Vientiane, Lao PDR.

### HIV planning in the Pacific

The National Strategic Frameworks (NSF) Project aims to improve the quality of national strategic HIV and AIDS frameworks in 10 Pacific countries. The NSF Project, funded by the Secretariat of the Pacific Community (SPC), is now 18 months into its implementation. Centre for International Health staff have worked with a broad range of government, United Nations, and civil society partners to review the current status of national strategic plans in each of the nominated 10 countries. Subsequently, we have helped develop new strategic frameworks in the Solomon Islands, Federated States of Micronesia, Marshall Islands and Kiribati. Under a separate mechanism, similar assistance was provided to Fiji.

### Promoting health security in the Asia and Pacific regions

**One Health** is the collaborative effort of multiple disciplines – working locally, nationally and globally – to attain optimal health for people, animals and our environment. The concept derived from joint efforts by the human and animal health sectors to contain outbreaks of emerging infectious diseases (EIDs), such as avian influenza. In February 2011, the inaugural International One Health Conference was held in Melbourne with active participation by Burnet staff. During the year our staff helped develop Vietnam's Integrated National Operational Program on Avian Influenza, Pandemic Preparedness and EIDs (2011-2015) and a Pacific regional health security plan based on the One Health approach.



*One Health is a collaborative effort – working locally, nationally and globally – to attain optimal health for people, animals and our environment.*

### Providing the evidence to support health reform in China

China has a three-year rapid agenda for health system reform. The Burnet Institute manages the innovative AusAID-funded China-Australia Health and HIV Facility (CAHHF), which works in direct partnership with China's Ministry of Health. Of the 39 activities funded up until 2011, 31 (plus a further 11 in 2012) were assessed as having direct health reform policy relevance. Studies have been conducted through partnerships between 23 Chinese agencies and 26 Australian academic institutions and have led to 120 papers published in Chinese health journals and 10 in international journals. CAHHF provided the context for the dialogue between the Australian Health Minister, Nicola Roxon and Chinese Health Minister, Chen Zhu in April 2011 that focused on health care reforms.



*Australian Health Minister, Nicola Roxon and Chinese Health Minister, Chen Zhu focus on health care reforms.*

### Engaging in Indonesia's response to HIV and AIDS

The Burnet Institute has been a partner in AusAID-funded bilateral HIV and AIDS prevention and care projects in Indonesia since 1997. The eight-year HIV Cooperation Program for Indonesia (HCPI), is implemented by GRM International in partnership with Burnet, focusing on people who inject drugs, prisoners, and Papua and West Papua provinces. SUM represents Scaling Up of MARP (most at risk populations) participation. Burnet is working on SUM Phase II in a consortium led by Training Resources Group Inc. to implement this USAID-funded project that focuses on female sex workers, men who have sex with men, and people who inject drugs.

### Measuring the prevalence of HIV in Papua New Guinea

Papua New Guinea accounted for 19 of every 20 HIV cases reported in the Pacific region between 1984 and 2007. The media over many years have spoken of an impending 'catastrophe' and the medical literature reported 'an unfolding disaster'. Some research projected adult prevalence to be as high as 18 per cent by 2010. Few claims were based on comprehensive or representative data. The best estimate in 2010, based on testing pregnant women, was 0.7 per cent of the adult population. In order to obtain a representative estimate of HIV prevalence in each of the four regions of PNG, Burnet staff – in partnership with FHI 360 – began planning a national Integrated Bio-Behavioural study to be conducted during 2012.

### Advocacy to eradicate polio from the world

In the mid-1980s, around 350,000 people, mainly children, were paralysed and/or died annually due to infection with the wild polio virus. As of 4 January 2012, just 602 cases of polio had been reported during 2011. In India, which only recently had thousands of cases every year, the last case reported was on 13 January 2011. Most cases now occur in just five countries – Pakistan, Chad, DR Congo, Nigeria, and Afghanistan. Between July and November 2011, Burnet partnered with the Global Poverty Project to support The End of Polio campaign, which focused on raising funds from Commonwealth nations during CHOGM in Perth. The outcome was \$118 million pledged for polio eradication, including \$50 million by Australia.

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## *Turning research into practical action:*

*A major strategic focus for the Institute is the translation of our research into tangible benefits for the global community. Initiatives that nurture Burnet's innovation and excellence are supported through our Office for Business Development, Innovation and Research. We also have several fee-for-service facilities which provide assistance to the broader scientific community.*

## Office for Business Development, Innovation and Research

Initiatives that nurture **Burnet's innovation and excellence** are supported, with an emphasis on activities that draw on expertise from across the Institute. We work in collaboration with commercial partners to develop the **Burnet's intellectual property (IP)** and over many years have developed a number of applications that are now in use around the world. Under the direction of Associate Professor David Anderson, the Office for Business Development, Innovation and Research also focuses on **bringing investment into the Institute** that supports and advances priority research agendas, fostering collaboration both within the Institute and with external partners. For laboratory scientists, this might mean support in **sourcing investment** in (and protecting) their IP that allows their work to progress to the next level; for public health researchers, the support offered by the team might result in diversified funding sources and/or **international collaborators** that extend the reach of their projects/studies.

Through the Office for Business Development, Innovation and Research, the Institute has two groups in place to oversee decisions and provide advice on commercial and IP matters. They are the Board IP and Commercialisation Committee, and the IP and Commercialisation Working Group.

*Further information about either of these oversight committees can be found at [burnet.edu.au](http://burnet.edu.au).*

### Research Translation

Burnet has a strong culture of **translating research outcomes** and has been successful in developing novel technologies such as vaccines, diagnostics and therapeutics, some of which have reached the market.

### Vaccines

Our laboratories are **developing novel vaccines** and vaccine-delivery platforms for diseases including HIV, malaria, hepatitis C and cancer. We translate research outcomes through either directly out-licensing, or **forming spin-out companies**. One of our out-licensed vaccine technologies is currently **entering into Phase III clinical trials** due for completion in 2012/13.

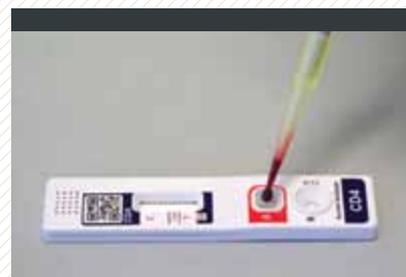


*Our laboratories are developing novel vaccines and vaccine delivery platforms for diseases like malaria.*

### Drug Development

Burnet has strong capabilities in identifying novel **targets for drug development** through its research in **understanding the mechanisms** of infection for malaria and for viral diseases such as HIV and hepatitis C. This involves understanding the interaction between host cells and viruses/parasites and could lead to novel treatments. Additionally we

have capabilities in computational drug development that has led to the development of **compounds that show promise** for the treatment of rheumatoid arthritis.



*Burnet has a strong culture of developing novel technologies such as vaccines, diagnostics and therapeutics.*

### Diagnostics

A core capability of Burnet is the **development of novel Rapid Point-of-Care (RPOC) diagnostic tests** through the expertise of Associate Professor David Anderson and his team. Associate Professor Anderson's laboratory has developed a number of RPOC tests for use in the developing world including hepatitis E, hepatitis A and active syphilis tests and has been able to **successfully partner with manufacturers** to bring the hepatitis E test to the market. The team is currently working towards out-licensing and registration of the world's first RPOC test for **measuring CD4+ T-cell levels**, essential for managing HIV in developing countries.

Further information about our commercialisation and translational research can be found at [burnet.edu.au/translationalresearch](http://burnet.edu.au/translationalresearch).

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## Turning research into practical action:

*Burnet's Specialised Research Facilities provide services to the scientific research community here at the AMREP (Alfred Medical Research and Education Precinct) campus and more broadly across Melbourne and throughout Australia.*

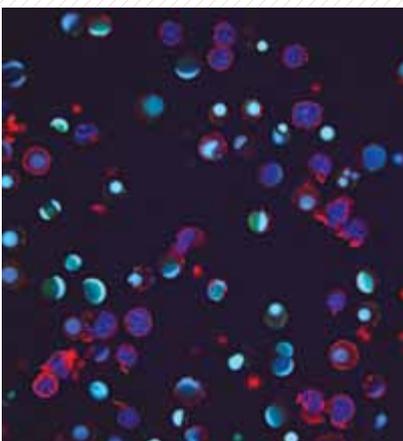
### Specialised Research Facilities



#### AMREP Flow Cytometry Core Facility

The **AMREP Flow Cytometry Core Facility** is a world class cell sorting and cell analysis laboratory catering for the scientific research community at AMREP and across broader Melbourne. During 2011, the AMREP user database approached the 150 personnel mark with our analysis and sorting platform usage increasing by 50 per cent. In addition to many new users gaining confidence and competency to use the instruments via our extensive induction, education and licensing procedures, funding was obtained to purchase two new state-of-the-art Flow Cytometers (BD Fortessa, BD InFlux) which will be installed and available to the precinct during 2012.

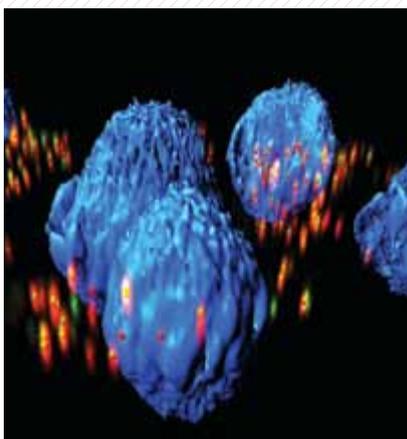
**Contact:** AMREP Flow Cytometry Core Facility / Mr Geza Paukovics / +61 3 9282 2246 / paukovic@burnet.edu.au / [www.amrepflow.org.au](http://www.amrepflow.org.au)



#### Antiviral Screening Facility

The **Antiviral Screening Facility** has the capacity to test chemical agents that will inhibit the replication of HIV and herpes simplex (HSV) type 1 and 2 viruses in cell culture assays. This means that researchers can accelerate the development of new inhibitors that may lead to better treatments for these chronic infections. In 2011, the Facility evaluated molecules and peptides for their ability to inhibit HIV-1 replication for several research groups in Australia. In a study in collaboration with Professor David Craik from the Institute for Molecular Bioscience in Queensland, we found that cyclotides, which are cyclic peptides derived from plants, have direct killing activity against HIV-1.

**Contact:** Burnet Antiviral Screening Facility / Associate Professor Gilda Tachedjian / +61 3 9282 2256 / gildat@burnet.edu.au / [www.burnet.edu.au/facilities/2\\_asf](http://www.burnet.edu.au/facilities/2_asf)



### Cell Imaging Facility

Burnet's **Cell Imaging Facility (CIF)** provides guidance in project design and training/support in image acquisition and analysis. The CIF has state-of-the-art microscopes in BSL3 and BSL2 laboratories, which are especially designed for the live cell imaging of highly infectious human pathogens such as HIV or malaria parasites. Over the past year, 41 users from 16 different groups across the Burnet Centres for Virology and Immunology, Baker IDI and Monash University have used the services provided by the CIF.

**Contact:** Burnet Cell Imaging Facility / Dr Candida da Fonseca Pereira / +61 3 9282 2292 / [cfpereira@burnet.edu.au](mailto:cfpereira@burnet.edu.au) / [www.burnet.edu.au/facilities/1\\_cif](http://www.burnet.edu.au/facilities/1_cif)



### Diagnostic Development Laboratory

The **Diagnostic Development Laboratory** attempts to address the unmet need for new and/or improved tests for many diseases that predominantly affect vulnerable populations. We do this by using innovative and proprietary methods but typically in a lateral flow-test device, a format similar to those widely used for diagnosis of diseases such as HIV and malaria in the developing world. Importantly, these tests must give reliable results, yet be suitable for use in resource-poor settings. During 2011, our focus was to develop and validate diagnostic tests for priority diseases.

**Contact:** Burnet Diagnostic Development Laboratory / Associate Professor David Anderson / +61 3 9282 2239 / [anderson@burnet.edu.au](mailto:anderson@burnet.edu.au) / [www.burnet.edu.au/facilities/7\\_ddl](http://www.burnet.edu.au/facilities/7_ddl)



### ImmunoMonitoring Facility

The **ImmunoMonitoring Facility (IMF)** supports both internal and external vaccine and immunotherapy research and development, by conducting validated immunological assays to monitor the immune responses generated. The Facility is accredited under NATA's R&D program as compliant with requirements in ISO/IEC 17025 (2005), and in October 2011 achieved re-accreditation by NATA. In 2011, immunomonitoring commenced for a new Phase I trial, and immunological services for a Phase IIb trial were also conducted. The Burnet IMF continues to provide immunological services for many of the Institute's hepatitis C cohort studies. The acquisition of a new high throughput flow cytometer (FACS Verse) will greatly expand the range of immunological assays offered.

**Contact:** Burnet ImmunoMonitoring Facility / Associate Professor Rose Ffrench / +61 3 9282 2285 / [ffrench@burnet.edu.au](mailto:ffrench@burnet.edu.au) / [www.burnet.edu.au/facilities/4\\_imf](http://www.burnet.edu.au/facilities/4_imf)



### International Clinical Research Laboratory

The **International Clinical Research Laboratory (iCRL)** is one of the few laboratories worldwide with expertise in all aspects of HIV laboratory monitoring. The lab has significant experience in evaluating low-cost tests (CD4, HIV viral load and HIV genotyping) and providing technology transfer of these tests to laboratories within resource-constrained countries. We are the World Health Organization (WHO) Regional Reference Laboratory for HIV Drug Resistance testing for the Asia Pacific Region as well as a NATA/RCPA (ISO15189) accredited laboratory. During 2011, we provided many services including: laboratory capacity-building and general strengthening – covering laboratory establishment or expansion; laboratory safety practises; work flow; document management; development of standard operating procedures; staff mentoring and retainment; and quality assurance.

**Contact:** International Clinical Research Laboratory / Ms Adele Lee-Wriede / +61 3 9282 2254 / [adele@burnet.edu.au](mailto:adele@burnet.edu.au) / [www.burnet.edu.au/facilities/6\\_icrl](http://www.burnet.edu.au/facilities/6_icrl)

# EDUCATION AT BURNET



Dr Mark Stoové (left) with PhD and Honours students from the Centre for Population Health.

The Burnet Institute is a recognised provider of quality international public health education and postgraduate research, with the aim of providing world-class research training to local and international PhD and Honours students in public health, infectious diseases and immunology. The mission of the Education Program at Burnet is to ensure that the Institute consistently delivers high quality research and training programs to new investigators, to help deliver better health outcomes to poor and vulnerable communities in Australia and internationally.

During 2011, Burnet, in collaboration with RMIT University, ran a new postgraduate unit on ‘Viral Infections’ which is part of the Graduate Diploma/ Master of Biotechnology. The course was coordinated by Emeritus Professor Greg Tannock, with Deputy Coordinators Associate Professor Paul Gorry and Professor Margaret Deighton (RMIT University). As well as 12 weeks of lectures at the Alfred Medical Research

and Education Precinct (AMREP), the course included a five-day practical block in RMIT University. The course was extremely popular, attracting 44 enrolments, many of whom were international students, with the end-of-course evaluation feedback being very positive. Discussions are now underway to explore the possibility of delivering this course in Vietnam in 2012.

In March 2011, Dr Maria Davoren was welcomed to Burnet as the Education and Grants Management Officer. In her role, Maria has provided additional administrative support to the education team, facilitating the expansion of the program.

Key improvements have included the design of new online student registration forms, an appraisal and revision of the review and monitoring process for Burnet research students, management of the intra- and internet content for the Institute’s research program, and development and maintenance of a student database.

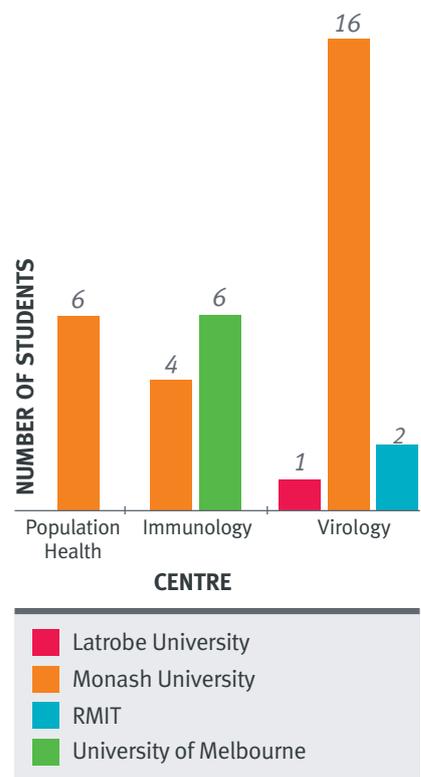


Figure 1 – Burnet PhD students by Centre and enrolling University as at December, 2011.

## Studying medical research at Burnet

### Honours Program

In 2011, the Institute hosted 12 Honours students from the University of Melbourne, Monash University and La Trobe University. Their Honours projects covered diverse areas of research including the immunology of hepatitis C virus (HCV) infection, the structure and function of cell surface receptors, determining sexual risk practices and STI awareness, and HIV-1 associated dementia.

#### Highlights of the Honours Program:

*A very high percentage (>80%) received first class Honours | Muriel Aldunate received the highest Honours mark in the Department of Microbiology at Monash University, and was awarded the Ed Westaway Award | Participation of ten Honours students in Burnet's Student Symposium series.*

### PhD Program

In 2011, the Institute had 35 students undertaking PhD research programs, enrolled via Monash University, the University of Melbourne, La Trobe University and RMIT University (Figure 1.) These PhDs covered a range of topics including HIV entry and replication, HCV virology and immunology, autoimmune disease, malaria, drugs and alcohol, sexual health, and vaccine development.

#### Highlights of the PhD Program:

*Johanna Dean was awarded the CSL Prize from the Department of Microbiology for the best PhD thesis of 2011. Eleven PhDs were awarded in 2011. | Daniel Cowley, Virology | Johanna Dean, Virology | Vanessa Evans, Virology | Jacqueline Flynn, Immunology | Judy Gold, Population Health | Ali Gorzin, Virology |*

*Hamed Gouklani, Virology | David Hawkes, Virology | Kathleen McCaffrey, Virology | Edwina Wright, Virology | Eunice Yang, Immunology.*

### Student Awards

#### Award winning students in 2011:

**Michelle Boyle, Immunology**  
Harold Mitchell Foundation Postgraduate Travel Fellowship; Miller Foundation Biomedical Research Travel Award; Best Oral presentation at Malaria in Melbourne (MiM) conference; and Australian Society for Parasitology (ASP) Student Travel Award.

**Hayley Bullen, Immunology**  
Miller Foundation Biomedical Research Travel Award.

**Jo-Anne Chan, Immunology**  
Australian Society for Parasitology (ASP) Student Travel Award; OzeMalaR Travel Award; Best Poster Award, Lorne Infection and Immunity Conference.

**Elisha Horat, Immunology**  
Immunology Group of Victoria, Student Presentation Award.

**Michael Roche, Virology**  
Sapphire Bioscience Young Achiever Award, and Queensland Health Student Travel Award, Australian HIV and Hepatitis Virology Conference.

**Rachel Sacks-Davis, Population Health**  
Travel Award, European Association for the Study of the Liver (EASL) to attend Berlin Conference.

### Student Symposia 2011

Following on from last year's successful inaugural student symposium, a symposia series comprising student presentations and professional development sessions were held over three half days in 2011. During the series, ten Honours and 25 PhD students from across the Institute presented their diverse and interesting research to their peers and Institute staff.

At the first symposium, this session consisted of an introduction and overview

of a new web-based presentation tool called Prezi. Internal and external speakers at different stages of their research career were invited to present at a session on 'Writing Fellowships and Grants'. At the final symposium, three external speakers from academia and industry spoke to students about their current positions and the path they navigated to get there.

### Winners of the 2011 Student Symposia Awards:

#### PhD

① **1st prize: Christina Chang, Virology.**

② **Runner up: Sarah Charnaud, Immunology.**

#### Honours

① **1st prize: Genevieve Martin, Virology.**

② **Runner up: Jeff Smith, Immunology.**

#### Associate Professor Anthony Jaworowski

Tel: +61 3 9282 2127  
anthonyj@burnet.edu.au



#### Ms Marion Brown

Tel: +61 3 9282 2167  
mbrown@burnet.edu.au



#### Associate Professor Rosemary Ffrench

Tel: +61 3 9282 2285  
ffrench@burnet.edu.au



#### Associate Professor Heidi Drummer

Tel: +61 3 9282 2179  
hdrummer@burnet.edu.au



## Studying Public Health at Burnet

Burnet Institute is a recognised provider of quality international public health education and training courses, ranging from post-graduate education in Australia to training for government officials, local health workers and community groups in developing countries. The Centre for International Health is actively involved in the design and delivery of public health education programs, including the coordination of the International Health stream of the Masters of Public Health (MPH) program and the Graduate Diploma in International Health. These courses are run in collaboration with the Department of Epidemiology and Preventive Medicine (DEPM) at Monash University. Some courses are jointly accredited with the University of Melbourne, which also offers a Masters level accredited course in Public Health.

### Highlights of the public health education program for 2011

#### Alcohol and Other Drugs in Society unit

This unit, accredited to the Monash University MPH and jointly delivered by Burnet's Centres for International Health and Population Health, was offered for the first time in 2011. The short course is designed as a contemporary analysis of drug use in modern societies, aiming to enhance participants' knowledge about the risk and vulnerability of individuals and communities to licit and illicit drug use. The course attracted 14 students this year and we're confident that these numbers will steadily increase as the course becomes more widely known.

#### Effective responses to HIV in developing countries short course

Burnet conducted this tailored five-day short course, coordinated by Lisa Renkin, for nine staff from AusAID in December 2011.

AusAID staff attended from Indonesia (2), Burma (1) and Canberra offices. The evaluation feedback was very positive. One participant commented that it had been "an excellent training course, well delivered and facilitated."

#### Support to the National University of Timor Lorosa'e (UNTL)

Burnet is in the process of exploring ways that the Institute can provide support to establish a locally-accredited Master of Public Health program at the National University in Timor-Leste. A proposal, in collaboration with other providers of public health education in Australia, including NGOs, has been developed. This is an exciting initiative that offers great potential for 2012, further strengthening the partnership between the Institute and government bodies in Timor-Leste.

## Our students in 2011

Twelve Honours students joined Burnet in 2011, and 12 students began their PhDs.

### PhD Students

**Thomas Angelovich**

→ Virology



**Joseph Doyle**

→ Population Health



**Brendan Elsworth**

→ Immunology



**Benjamin Fancke**

→ Immunology



**Yagmur Farsakoglu**

→ Virology



**Janet Gare**

→ Virology



### Honours Students

**Jun Gu**  
 ↳ Virology



**Muriel Aldunate**  
 ↳ Virology



**Tom Sidwell**  
 ↳ Immunology



**Katherine Harvey**  
 ↳ Immunology



**Mariel Bartley**  
 ↳ Virology



**Jeffrey Smith**  
 ↳ Immunology



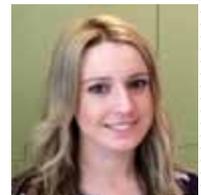
**Joshua Hayward**  
 ↳ Virology



**Charlene MacKenzie**  
 ↳ Virology



**Alyce Vella**  
 ↳ Population Health



**Elisha Horat**  
 ↳ Immunology



**Genevieve Martin**  
 ↳ Virology



**Casey Welsh**  
 ↳ Virology



**Danielle Horyniak**  
 ↳ Population Health



**Maria Petrou**  
 ↳ Immunology



**Baotuti Sebolao**  
 ↳ Virology



**Sushama Telwatte**  
 ↳ Virology



**Dean Ramsbottom**  
 ↳ Immunology



**Ope Maroba**  
 ↳ Virology

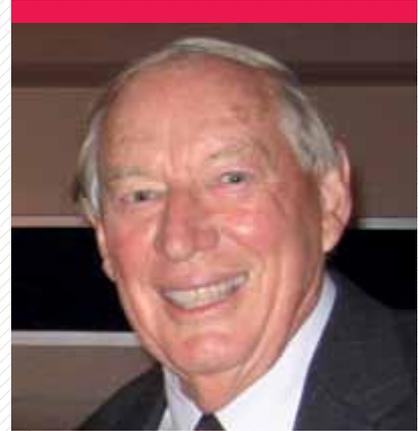


If you would like further information about any aspect of the Education Program offered by Burnet, please visit our website at [burnet.edu.au](http://burnet.edu.au).

## Our supporters make a difference



• Professor James Beeson (seated front) with his malaria lab staff.



• Mr Jim Beaver, a long-term and most-valued supporter of Burnet's work.

*Over the past year Burnet has made great progress towards further understanding, treatment and prevention of diseases of global significance.*

This would not have been possible without the financial support of many private philanthropists and Trusts and Foundations, which has enabled the further development of existing research and public health programs and the initiation of new programs.

We are extremely grateful to our supporters who share our passion and commitment to create a healthier world.

Thank you to the many individual supporters who donated to our public appeals, and have shown interest in particular projects. Those mentioned here represent the many different ways our supporters have chosen to support Burnet.

### People sharing their good fortune

Many private donors choose to share their good fortune through family run foundations. These include **Kel and Rosie Day Foundation** and the **Orloff Family Foundation** who have been enthusiastic supporters of Burnet for many years. Representatives from these family foundations have visited our labs and have seen for themselves the programs they support, and we are grateful for their commitment to Burnet's mission.

Together with many of our other committed donors, many families have supported the purchase of a range of medical research equipment. This investment in our equipment enables us to be more efficient and effective in our research and development of much needed vaccines for HIV, hepatitis C, cancers and malaria, as well as therapies for autoimmune diseases.

### Leaving a legacy

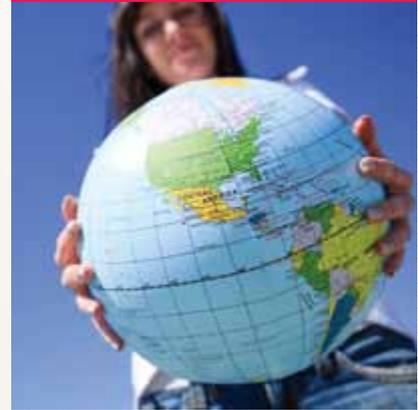
A very generous bequest from **Christopher James (Jim) Beaver** has provided funding in perpetuity for postdoctoral researchers in infectious diseases. The Jim and Margaret Beaver Fellowships, to be awarded annually to outstanding early career researchers, will provide continuity in the planning and development of research projects and help Burnet retain and develop the talents of our most brilliant young scientists. This is an extraordinary legacy from one of Burnet's most valued and long-time supporters.

Every bequest to Burnet, however small or large, is gratefully received, and helps us plan for the long-term future with confidence. We thank **Georgena Elizabeth Bradshaw, Ronald William Gibb, Ivy Winifred (Joan) Hartley, Margaret Lyle Herring, Valerie Elizabeth Kelly** and **Keith Ronald Ross** for their special support of Burnet's work through a gift in their Will.

*“We are extremely grateful to our supporters who share our passion and commitment to create a healthier world.”*



- With support from our committed donors we are able to purchase state-of-the-art scientific equipment.



- Support from our Trusts and Foundations assists Burnet's students by funding Travel Awards.

### Big business making a difference

Our corporate supporters have enabled Burnet to make significant and remarkable achievements in the public health and medical research field. Through these partnerships we build more sustainable and healthy communities in Australia and overseas.

Generous donations from **Blake Dawson** have made a significant contribution to our work in Papua New Guinea (PNG) to implement point-of-care CD4 testing in order to increase access to therapy for those infected with HIV. This project also contributes to building the capacity of staff and strengthening laboratories in PNG, and introducing collaborative research projects to strengthen evidence-based clinical practices.

**Goldman Sachs'** staff have been a long-term supporter of Burnet, donating to many of our vital areas of work including the Centre for Population Health's programs helping marginalised young Victorians with mental and physical health needs.

### Trusts and Foundations supporting excellence

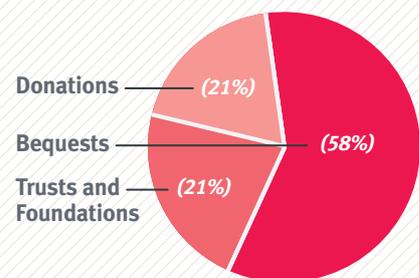
Trusts and Foundations have been a major contributor to our work in 2011. Below are some examples of outcomes made possible through the support of Trusts and Foundations.

**The Ian Potter Foundation's** major donation has enabled Burnet to progress research in malaria through the establishment of The Ian Potter Malaria Research Laboratory, which will house Professor James Beeson and his team of malaria researchers.

Continued support from the **Harold Mitchell Foundation** has nurtured the talents of the Institute's young PhD students and early postdoctoral researchers through funding travel and participation in international conferences.

**The Invergowie Foundation** partnered with Burnet's Centre for Population Health to provide funds to support a female outreach worker to be trained in harm reduction strategies in urban marginalised Melbourne communities.

### Fundraising for 2011



**Total: \$5,674,301.33**

For more information about any of these projects, please contact Ms Ruth Rosh, or visit our website at [burnet.edu.au](http://burnet.edu.au).

#### Ms Ruth Rosh

Tel: +61 3 8506 2332  
ruth.rosh@burnet.edu.au



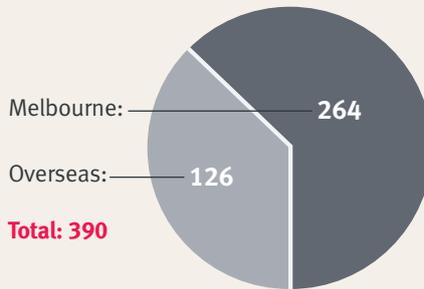
## Behind the scenes

### Our people at a glance

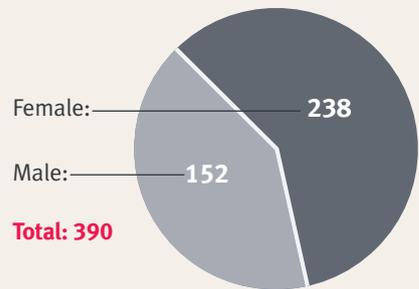
What makes Burnet's work unique is the integration of our laboratory-based medical research with field-based public health programs. Both the lab and field programs at Burnet have contributed greatly to the international body of knowledge regarding many diseases; from diagnosis and treatments, through to the minimisation and prevention of their spread.

*These graphs indicate the distribution of our personnel by location, gender and the type of work undertaken at Burnet.*

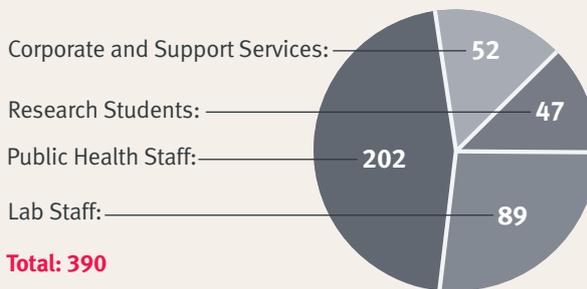
#### PERSONNEL BY LOCATION:



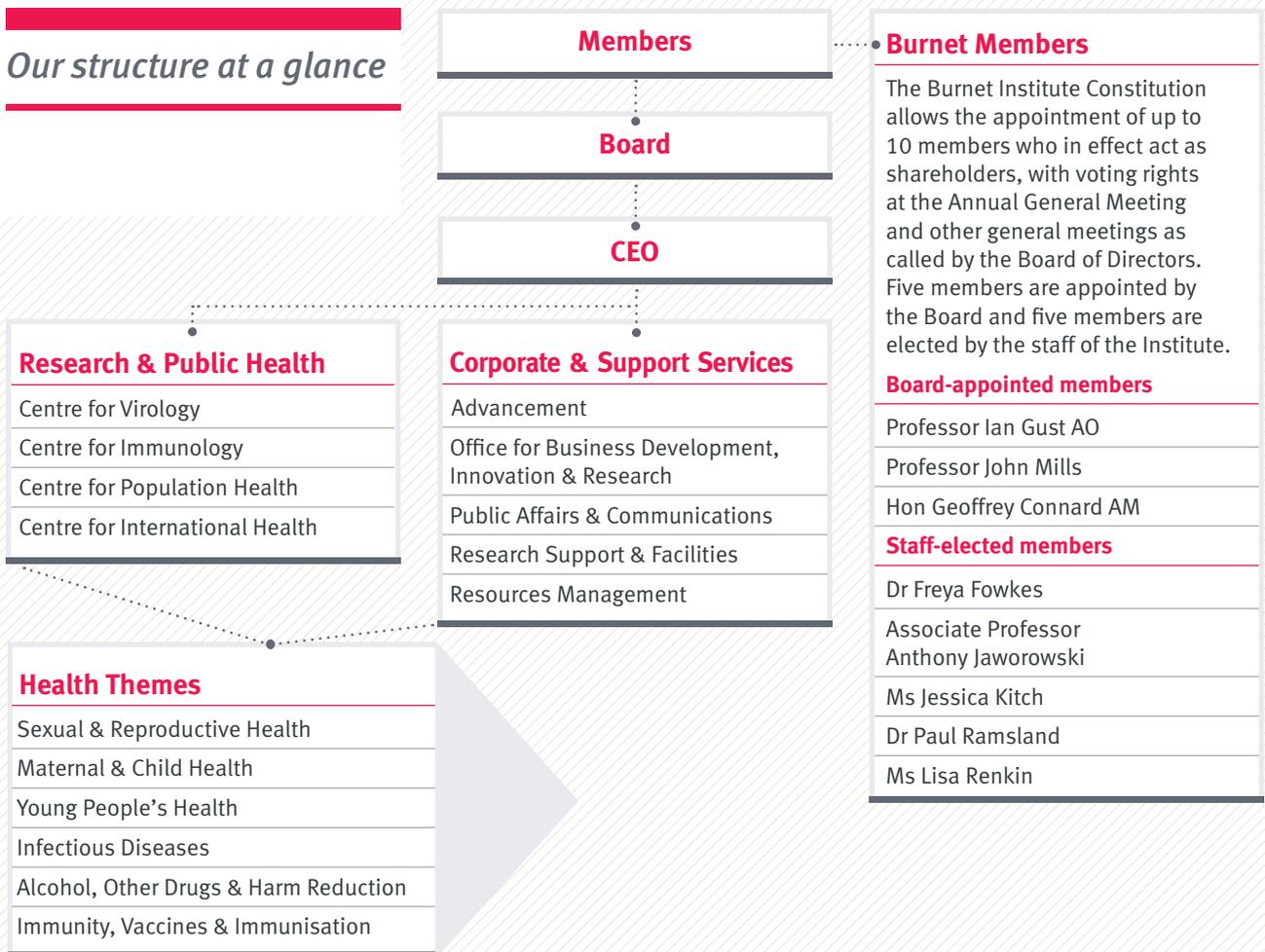
#### PERSONNEL BY GENDER:



#### PERSONNEL BY TYPE OF WORK:



### Our structure at a glance



## Our finances at a glance

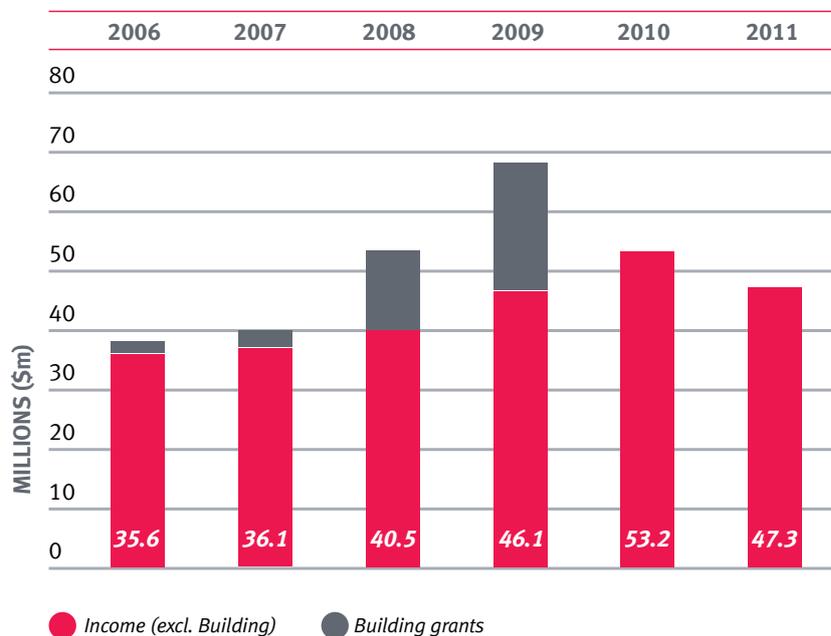
The Burnet Institute had an active and successful year in its core activities of laboratory and field research and delivery of its public health programs in the areas of infectious diseases and related health disciplines. A number of key output indicators, especially the high number of peer-reviewed publications and the awarding of new competitive grants, demonstrate the quality and impact of the Institute's work.

The Institute recorded a financial deficit for 2011, however the majority of this related to non-operational factors including the revaluation of derivatives and the depreciation/amortisation of property assets.

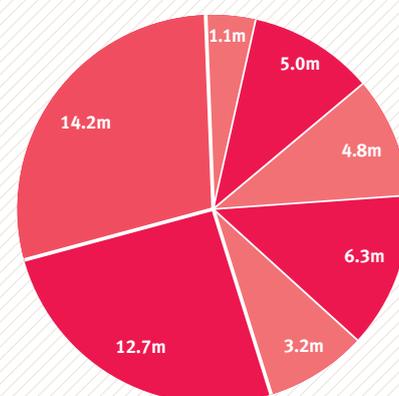
Operational factors impacting on the result were largely to do with the overall tightening and shifts in international health funding programs and the sector's limited capacity to recoup funding for indirect costs so vital in supporting our research and public health activities.

Burnet continues to focus on addressing the challenges of income generation and, in particular, the ongoing realignment of our international health operations to the prevailing economic conditions.

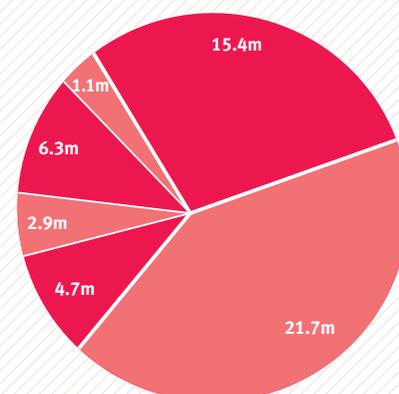
### TURNOVER 2011 (2006–2011)



INCOME FOR 2011	(\$m)
Commercial	1.1
Property management and investments	5.0
Donations and fundraising	4.8
Research grants (NHMRC + other)	14.2
Government operational infrastructure	6.3
AusAID	12.7
Other International health income	3.2
<b>Total:</b>	<b>\$47.3m</b>



EXPENDITURE BREAKDOWN	(\$m)
Research	15.4
Fundraising	1.1
Alfred Centre Stage 2	6.3
Administration	2.9
Facilities and maintenance	4.7
Public health	21.7
<b>Total:</b>	<b>52.1m</b>



## Behind the scenes

### Our Board and Governance



Our Board brings together individuals with a rich and comprehensive knowledge base from which to govern the Institute. We are truly fortunate and grateful for the support we receive from these champions of our work.

Following is a list of the Members of our Board, all of whom act in an honorary capacity, along with the Executive Director and Deputy Executive Director, who are paid members of staff.

#### Board Members

- ① **Mr Alastair Lucas AM, BCom, FCPA**  
(Chair)
- ② **Professor Brendan Crabb, PhD**  
(Executive Director and CEO)
- ③ **Professor Peter Colman, BSc, PhD**
- ④ **Mr Ross Cooke, BCom, ACA**
- ⑤ **Mr John K Dowling, FREI, FAPI**
- ⑥ **Professor, the Honourable Barry O Jones AO, FAA, FAHA, FTSE, FASSA, FRSA, FRSV, FAIM**
- ⑦ **Mr Henry Lanzer, BCom, LLB**
- ⑧ **Mr Robert L Milne, BEng (Civ), FIE (Aust), CP Eng**
- ⑨ **Professor Christina Anne Mitchell, MB BS (Melb), PhD, FRACP**
- ⑩ **Ms Mary Padbury, BA, LLB**

- ⑪ **Professor Philippa Pattison, BSc, PhD**
- ⑫ **Ms Natasha Stott Despoja AM**
- ⑬ **Professor Michael Toole, MBBS, B Med Sci, DTM&H, (Deputy Executive Director)**
- ⑭ **Ms Mary Waldron, BEcon & SS, FCPA**

#### Directors who resigned during 2011:

**Ms Denise Allen**  
**Associate Professor David Anderson, PhD**  
**Professor Peter Doherty AC, FAA, FRS**  
**Professor P Mark Hogarth, PhD**  
**Professor James McCluskey, MBBS, B Med Sci, MD, FRACP, FRCPA**  
**Mrs Maria Myers AO, BA, BSW, LLB**

- **Burnet Ambassador** *Deanna Blegg with a young boy from Lae, PNG.*

## Our Patrons and Ambassadors



### Patrons

*Patron-in-Chief*

Governor of Victoria

**The Honourable Alex Chernov AC, QC**  
*Patrons*

**Professor Gordon Ada AO**,  
*Australian National University*

**Honourable Steve Bracks AC**, *Former Premier of Victoria*

**Mr Nobby Clark AO**, *Former Chief Executive Officer, National Australia Bank*

**Doctor John Connell AM**, *Founder, John Connell and Associates*

**Professor Allan Fels AO**, *Former Chairman of ACCC and Dean of the Australian & New Zealand School of Government*

**Rt Honourable Malcolm Fraser AC**,  
*Former Prime Minister, Australia*

**Professor David Ho**, *Director, The Aaron Diamond AIDS Research Centre, New York*

**Honourable Michael Kirby AC, CMG**,  
*Member of the International Bioethics Committee of UNESCO, and Member of the UNAIDS Global Panel on Human Rights*

**Mr Eddie McGuire AM**, *Journalist and Television Personality*

**Professor Sir Peter Morris AC**,  
*Royal College of Surgeons, London*

**Mr John So**, *Former Lord Mayor of Melbourne.*

### Ambassadors

**Ms Deanna Blegg**, *Elite athlete and HIV-positive mother*

**Ms Belinda Collins**, *author and AIDS activist*

**Mr Harry (Heretier) O'Brien**,  
*Collingwood Football Club player and humanitarian*

**Ms Princess Kasune Zulu**, *author and AIDS activist.*

### Affiliations

Burnet Institute is a partner in The Alfred Medical Research and Education Precinct (AMREP) with close working relationships and collaborations with The Alfred hospital, Baker IDI Heart and Diabetes Institute, and Monash University. In addition, the Burnet Institute has formal affiliations with the University of Melbourne and Monash University.

## Where we work

### Our work makes a difference around the world

Translating new knowledge into health practice is a major focus of our extensive work with affected communities in Australia and many countries in the Asia and Pacific regions.

Whilst our head office and laboratory research is based in Melbourne, we have long-term staff in Tibet/China, Indonesia, Lao PDR, Myanmar (Burma) and Papua New Guinea.

In addition, the Centre for International Health maintains an active interest in Southern and Eastern Africa, Timor-Leste, Melanesia (Vanuatu, Solomon Islands), Cambodia, Vietnam, Nepal, Sri Lanka, and Afghanistan/Pakistan.

### Key Populations and Settings

Our work is focused on achieving better health for poor and vulnerable communities in Australia and internationally. We work closely with a range of key populations including:

- *Resource-poor communities*
- *Marginalised communities*
- *Prisoners*
- *People at risk of blood-borne viruses*
- *Aboriginal communities.*

Further information about our overseas work is available at [burnet.edu.au](http://burnet.edu.au).

ATLANTIC  
OCEAN

EASTERN  
AFRICA

ZIMBABWE

SOUTHERN AFRICA

SOUTH  
AFRICA



-  BURNET'S PRIORITY COUNTRIES
-  BURNET'S COUNTRY OFFICES
-  BURNET'S PARTNER OFFICES

PACIFIC OCEAN

INDIAN OCEAN

# Staff list

## Major staff list

All staff listed in alpha order by Centre or Department

### Centre for Virology

#### Centre Heads

Professor Suzanne Crowe AM  
Professor Sharon Lewin

#### Personal Assistants to Centre Heads

Ms Arzum Cubuk  
Ms Sandy West

#### Anderson Laboratory – Diagnostic Development

Associate Professor David Anderson  
Ms Nadine Barnes  
Ms Mandy Beyer  
Ms Mary Garcia  
Ms Joy Liu  
Dr Peter Williamson

#### Cherry Laboratory – HIV Neuropathy and Toxicity

Associate Professor Catherine (Kate) Cherry  
Ms Constance Chew  
Ms Soula Fillipas  
Mr David Hooker

#### Churchill Laboratory – HIV Neuropathogenesis

Associate Professor Melissa Churchill  
Mr Daniel Cowley  
Ms Emma Crespan  
Dr Lachlan Gray  
Ms Charlene Mackenzie  
Mr Hamid Salimisedabad  
Ms Casey Welsh

#### Crowe Laboratory – Clinical Research, WHO Regional Reference Laboratory for HIV Resistance

Professor Suzanne Crowe AM  
Ms Eman Aleksic  
Ms Arzum Cubuk  
Ms Vicki Edouard  
Ms Janet Gare  
Ms Annike Griffey  
Dr Anna Hearps  
Ms Adele Lee-Wriede  
Dr Jessica Markby  
Ms Ope Maroba  
Ms Karen O'Keefe  
Ms Tan Hong Yien

#### Drummer/Poumbourios Laboratory – Viral Fusion

Associate Professor Heidi E Drummer  
Dr Andy Poumbourios

Mr Yousef Alhammad  
Ms Anna Bellamy-McIntyre  
Ms Irene Boo  
Dr Rebecca Butcher  
Ms Johanna Dean  
Mr Hamed Gouklani  
Dr Elizabeth Grgacic  
Ms Jun Gu

Dr David Harrison  
Mr Ashraf Khasawneh  
Ms Annemarie Laumaea  
Mr Kevin Tewierek  
Dr Patricia Vietheer

#### Gorry Laboratory – HIV Molecular Pathogenesis

Associate Professor Paul Gorry  
Ms Katharina Borm  
Mr Kieran Cashin  
Ms Anne Ellett  
Mr Michael Roche  
Dr Jasminka Sterjovski

#### Gowans/Loveland Laboratory – Hepatitis C Immunity and Immunotherapies

Professor Eric Gowans  
Dr Bruce Loveland  
Mr Phillipe Latour  
Dr Shuo Li

#### Jaworowski Laboratory – HIV Pathogenesis

Associate Professor Anthony Jaworowski  
Mr Thomas Angelovich  
Ms Wan-Jung Cheng  
Ms Yagmur Farsakoglu  
Dr Anna Hearps  
Mr Gregor Lichtfuss  
Dr Anna Maisa  
Ms Genevieve Martin  
Mr Clovis Palmer  
Ms Jingling Zhou

#### Mak Laboratory – HIV Assembly

Professor Johnson Mak  
Mr David Hawkes  
Dr Aurora Messina  
Mr Hanumant Singh Tanwar  
Dr Redmond Smyth

#### Tachedjian Laboratory – Molecular Interactions

Associate Professor Gilda Tachedjian  
Ms Muriel Aldunate  
Dr Jenny Anderson  
Mr Josh Hayward  
Mr Adam Johnson

Ms Jennifer La  
Ms Sophie Montag  
Ms Katie Moore  
Ms Simin Dokht Rezaei  
Dr Secondo Sonza  
Ms Sushama Telwatte  
Mr David Tyssen  
Ms Johanna Wapling  
Ms Soo Huey Yap

#### Tannock Laboratory – Influenza

Emeritus Professor Gregory Tannock  
Ms Hyunsuh Kim

#### Affiliated Laboratories

#### Lewin Laboratory – HIV and Hepatitis Immunopathogenesis

Professor Sharon Lewin  
Dr Jennifer Audsley  
Dr Paul U Cameron  
Ms Christina Chang  
Dr Megan Crane  
Dr Chris Desmond  
Dr Paula Ellenberg  
Dr Vanessa A Evans  
Dr Candida da Fonseca Pereira  
Dr David Iser

Ms Gabriela Khoury  
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