WESTERN AUSTRALIA’S NOBEL LAUREATES LEADING THE WAY
Western Australia’s Nobel Laureates
Leading the Way is the first long-term study of the social impact of a Nobel Prize.

It celebrates the contribution of Western Australian scientists Professor Barry J. Marshall AC and Emeritus Professor Dr J. Robin Warren AC in the decade since receiving the 2005 Nobel Prize for Medicine.

At a time when resources are scarce and communities are looking for proof of a return on investment, it demonstrates how Marshall and Warren have used their celebrity and influence to drive radical and sustainable community change and makes a strong case for why Australia should be doing more to support its heroes, many of whom go unsung.

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Photo: Frances Andrijich
"The 2005 Nobel Prize in Physiology or Medicine goes to Barry Marshall and Robin Warren, who with tenacity and a prepared mind challenged prevailing dogmas. By using technologies generally available .. they made an irrefutable case that the bacterium Helicobacter pylori is causing disease."

Excerpt from a press release issued by The Nobel Foundation, 3 October 2005
Message from the Hon. Julie Bishop MP, Minister for Foreign Affairs

I send my very best wishes to Professor Barry Marshall and Dr J. Robin Warren on the occasion of the 10th anniversary of the announcement of the Nobel Prize in Physiology or Medicine for their discovery of the bacterium *Helicobacter pylori* and its role in gastritis and peptic ulcer disease.

I am delighted to learn that both Professor Marshall and Dr Warren still meet every year to reflect on the announcement of this Nobel Prize.

It is no coincidence that of the 15 Australian winners of the Nobel Prize, the majority of them have been awarded in the field of Physiology or Medicine, highlighting the importance of health and medical research in Australia.

Both Professor Marshall and Dr Warren have been champions of the sector and an example of where Australians have challenged conventional thinking and taken risks to make medical breakthroughs. Their important research has made an invaluable contribution to the betterment of our country and the world.

*The Hon. Julie Bishop MP*

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Message from the Hon. Colin Barnett MP, Premier of Western Australia

Congratulations on the 10th anniversary of your Nobel Prize in Medicine. This special occasion provides an opportunity to celebrate your outstanding achievements and contributions to society in medical research and more broadly as an inspiration to others.

Your discovery of the bacterium *Helicobacter pylori* as one of the causes of gastritis and stomach ulcers has improved the lives of Western Australians and many others around the world. The honour of a Nobel Prize for this work is testament to your dedication to medical research for the benefit of humanity.

Global recognition of your achievements has helped to highlight the State’s broader capabilities in science, setting Western Australia on the international stage as a leading destination for quality research.

I acknowledge the roles you have undertaken as ambassadors for science, including working with young researchers and school students. This has provided a source of inspiration to many, including our next generation of scientists and thought leaders.

I thank you both for your positive contributions to Western Australia and look forward to our continued progress in medicine and health as a priority area for science in the State.

*The Hon. Colin Barnett MLA*
It has been a decade since Western Australian medical researchers, Professor Barry Marshall and Emeritus Professor Dr Robin Warren, were awarded one of mankind’s highest honours - the prestigious Nobel Prize for Physiology or Medicine.

The impact of their leadership during this period has reverberated internationally improving millions of lives, heightening interest in science and education, and drawing the international spotlight to Western Australia as an epicentre for technology and innovation.

The Western Australian Government recognised the historic Nobel announcement as a catalyst for transformative change in the community and a rare opportunity to generate lasting social and economic benefit for Australia. It provided both the vehicle and remit when it appointed Marshall and Warren as the State’s first Ambassadors for Life Sciences and funded a dedicated Office of the Nobel Laureates to support, promote and document their activities over 10 years.

Marshall and Warren were charged with raising public awareness and engaging the community in science by using their pre-eminent positions and colourful personal stories to “advise, educate, inform, promote and inspire”. The return on investment for the Western Australian community has been immense, in both social and financial terms.

This document is a snapshot of Marshall and Warren’s work as ambassadors for Western Australia and a testament to their energy, leadership and commitment. It offers a brief insight into the value they have generated as doctors, scientists and entrepreneurs – and in their role as teachers, mentors, role-models and advocates for technology, education and opportunity around the world.
AUSTRALIA’S INNOVATION AGENDA

Australia has put innovation on top of its agenda. The mining boom has given way to the “ideas boom” and billions of dollars have been earmarked to search for new sources of income and new ways to bolster productivity and living standards.

In April 2015, the WA Government declared that the State’s future hinged on its ability to harness world class science and the inaugural Science Statement for Western Australia was released.

Similarly, the National Innovation and Science Agenda was launched in December 2015. It argued that Australia needed to build a culture of creativity and reward the courage of those who pursued new ideas. It called for leadership in four critical areas:

- Culture and capital – building the confidence and resilience to embrace risk.
- Collaboration – establishing partnerships between business and academia to shape future industry and generate wealth.
- Talent and skills – encouraging students to pursue science and technology and attracting talent to Australia.
- Leading by example – setting the vision and creating the environment for Australians to succeed and prosper.

Both State and Federal innovation policies emphasised the potential for science to stimulate prosperity and reduce the nation’s reliance on its natural resources capital, while building up its human and social capital – the capacity of its people and the networks that enable society to be more productive.

They pointed to the iconic achievements of the country’s scientific pioneers, particularly Marshall and Warren, who have made a stellar contribution to change in each of the four areas.

“Science is fundamental to our society and affects every part of our life, from the food we eat, the medicines we take, to the technology we use. It has underpinned our social and economic wellbeing, improving our quality of life immeasurably. It is the key to unlocking Western Australia’s potential.”

The Hon. Colin Barnett MP
Premier of WA and Minister for Science, 2015
BUILDING INNOVATION THROUGH LEADERSHIP

It is through Marshall and Warren's dynamic example, powerful influence and tireless networking that relationships have been formed, new ideas have been generated, new talent attracted and millions of dollars in funding and resources have been drawn to healthcare, science and the economy of Western Australia.

The inspiring story of their journey to the Nobel Prize has been a platform for change, capturing international attention, bringing people together and encouraging innovation and partnership around the world.

Interest in the men and their work has been intense. Not only was their Helicobacter pylori discovery easy to understand, and directly relevant to the health and well-being of millions who suffered from stomach ulcers, but it featured all the storybook elements of inspiration, adversity, intrigue, perseverance, determination and ultimately grand success.

As a result, opportunities for Western Australia have continued to grow. These are spearheaded by the operations of a world-leading research centre at the UWA Marshall Centre for Helicobacter for Infectious Diseases Research and Training, which incorporates the Marshall Centre for Helicobacter Research Laboratory (MCHRL).

Social capital = the productive value of social connections.

“Social capital provides the glue which facilitates co-operation, exchange and innovation.”

OECD The New Economy: Beyond the Hype
Leading by example

People identified with the scientists’ pioneering struggle and the universal values they represent ie:

- **Curiosity** – how two unknown scientists were drawn together because they were curious and relentless in their pursuit of answers.

- **Inspiration** – despite poor funding, ridicule and rejection, they were resilient maintaining their self-belief for 20 years before their discovery was accepted. Famously, Marshall even drank the bacteria and made himself sick to prove the point.

- **Motivation** – how Nobel Laureates at the peak of their discipline chose to give back to the community in an often humorous and highly relatable way, Marshall delivered short speeches in Mandarin to the delight of Chinese audiences.

- **Change** – inevitably change had to happen; a change in peptic ulcer management, an overhaul of medical doctrine, and a shift in mindset with acceptance of ideas that challenge convention.

Marshall and Warren have contributed significantly to the growth of Australia’s social capital which the OECD recognises as a key economic resource and the backbone of a healthy and progressive economy.

The value they have created stems from the example they have set and the networks they have established as they travel the world promoting Australia as a science-savvy nation.

**Objectives as Ambassadors for Life Sciences:**

- Promote Western Australia’s research and innovation capability, nationally and globally, including emerging medical technologies.

- Improve Western Australia’s connections, nationally and internationally, in strategic research and innovation areas, including partnerships involving data sharing and researcher exchanges.

- Engage with the community of Western Australia (including industry, government and research sectors and the broader community) to advise, inspire and mentor, and raise science awareness in Western Australia.

- Strengthen engagement between the research sector in Western Australia and industry locally, nationally and internationally.

- Support Western Australian Government science priorities related to medicine and health, data and science engagement.

"Increasing evidence shows that social cohesion is critical for societies to prosper economically and for development to be sustainable."

_The World Bank_
MEASURING THE SOCIAL IMPACT

Evaluating the contribution of Western Australia’s first Ambassadors for Life Sciences and the benefits delivered, as a result of their activity, has been one of the key tasks of the Office of Nobel Laureates (ONL).

The ONL evaluation set out to quantify Marshall and Warren’s sizable economic contribution but it quickly became apparent that it also needed to consider their far-reaching impact on the State’s intangible assets, particularly growth in its social capital. There was no existing model to follow as research into the social impact of Nobel prize-winners was limited. Recipients were frequently rewarded at the end of a long career when their professional and community activity was winding down.

The Lauriette Model® was devised to provide a mechanism for assessing the social impact and social benefit of WA’s first Nobel Laureates and was the brainchild of ONL Manager Kris Laurie. Thousands of official engagements, events, lectures, tours, political and media interactions were painstakingly recorded and classified from October 2005 to June 2016.

An analysis of this activity has been used to produce a performance dashboard that enables Marshall and Warren’s achievements to be traced year-on-year providing insight into the changing emphasis of their work and shifting trends in the community.

The Lauriette Model®

- **Public Health Leadership**: Improving health outcomes and saving lives
- **Scientific Leadership**: Expanding WA’s global footprint and extending science boundaries
- **Educational Leadership**: Attracting and inspiring others to achieve their full potential
- **Community Leadership**: Stimulating community conversation and influencing social policy
- **Nobel Laureates & WA’s Ambassadors for Life Sciences**: Social Capital
<table>
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<th>LEADERSHIP GOAL</th>
<th>INPUT (ACTIVITY)</th>
<th>OUTPUT (ACTIVITY)</th>
<th>COMMUNITY BENEFIT</th>
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<td>• Developing new products</td>
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<td>3 Inspiring others</td>
<td>Encouraging others to achieve their potential by highlighting the benefits of</td>
<td>• Ambassadorsial activities</td>
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<td>education and using the example of their own lives and their story of winning a</td>
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<td>• Social media</td>
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<td></td>
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This dashboard is a summary of Marshall and Warren’s ambassadorial activities from October 2005 to June 2016. Annual results appear in the Decade of Discovery timeline later in this report. Using the Lauriette Model®, the graphs show a breakdown of activities by category against four key leadership themes – Public Health, Science, Education and Community.

- **Total invitations**: 6,598
- **Completed activities**: 4,409
- **Patients cured**: 1,131
- **Savings to WA public health**: A$18 MILLION
- **Public Health Leadership activities**: 1,985
- **Scientific Leadership activities**: 2,271
- **Educational Leadership activities**: 1,441
- **Community Leadership activities**: 1,653
- **Countries visited**: 37
- **Cities visited**: 148
- **Distance travelled**: >3 MILLION KM
- **Media interviews**: 414
“This is the first study tracing the long-term impact of a Nobel Prize. It paints a clear picture of the social and economic benefits Western Australia has realised, as a direct result of Marshall and Warren’s mighty achievements, and points to the advantages we can expect to accrue for decades to come. It adds to our understanding of social capital, our insight into the formation of global relationships and our appreciation for the living treasures in our community.”

Professor Paul Johnson
Vice-Chancellor, University of Western Australia, Perth, Western Australia
The microscopic stomach bug, known as *Helicobacter pylori* (*H. pylori*), affects half the world’s population. It creates an enormous yet preventable health care burden and Western Australia is home to the world’s experts on the issue.

In Western Australia alone, the Marshall Centre’s treatment regime for antibiotic resistant patients has a success rate of 91% and climbing. Over the reporting period, this has saved the State healthcare system A$18 million in lifetime care costs for patients with dyspepsia, peptic ulcers and gastric cancer. Internationally, healthcare savings could be as high as A$1.67 billion over the next 30 years.

Marshall and Warren are dedicated to bringing their knowledge and understanding of *H. pylori* to the global community, particularly in countries where infection is still rampant. As researchers hunt for new and better treatments, the job of educating scientists, clinicians, patients and politicians about *H. pylori* has been their priority.

Popular education and the media have helped build the awareness of patients and their doctors. They have spread the message that, by eliminating *H. pylori* infection, you can cure debilitating dyspepsia and peptic ulcer disease and halt the progression to gastric cancer - mankind’s third biggest cancer killer.

On the strength of their findings, nations have adopted mass public screening and treatment programs and resourced scientific collaborations to eradicate this infection. Other diseases are also under renewed investigation using insights gained from the *H. pylori* model.

In 2010 the World Gastroenterology Organisation – representing experts from Canada, China, France, Peru, Italy, South Africa, Brazil, Singapore, Sudan, Uruguay, Germany, US, Pakistan, Malaysia, Hong Kong, and the Netherlands – called for more public health interventions. It said that a 1% reduction in cancer mortality would add US$500 billion to the world’s economy through increased productivity and lower health costs.
Leadership in Public Health activities
October 2005 to 30 June 2016

414
Invited speaker

395
Advisory

346
Clinical

World’s most common infection

*H. pylori* is a major threat to public health. One in two people around the world are infected. In some communities, more than 90% have the bug. It is highly concentrated in some vulnerable groups, frequently associated with poor living conditions, and often passed from parents to young children.

In Australia, *H. pylori* infection rates have dropped to an all-time low of 15.4%, however some sectors of the population remain highly exposed, particularly older Australians, migrants and remote Indigenous communities.

Many people never experience symptoms but millions of others do and can suffer years of chronic stomach disease, with debilitating pain, gassiness, bad breath, vomiting, weight loss and the risk of sudden death. Left untreated, many develop stomach cancer. In the past, treatment ranged from anti-depressants and radical stomach surgery to lifelong doses of acid-suppressing drugs. Today, most *H. pylori* is curable with a short course of oral antibiotics.

Search for a cure

On the back of Marshall and Warren’s ground-breaking science, *H. pylori* became the first bacterium to be formally recognised as a class 1 carcinogen by the World Health Organisation. Discovering that antibiotics could provide a quick, low-cost and highly successful cure for an infection of this size and scale has had enormous social and economic benefits:

- **Increasing life expectancy** – improved diagnosis and treatment means fewer cases of gastric cancer and peptic ulcer disease. Gastric cancer currently leads to 1200 deaths per year in Australia. Most of these are preventable.

- **Improving quality of life** – treatment alleviates the suffering that comes with chronic stomach complaints such as gastritis, dyspepsia and bleeding ulcers. Current standard triple therapy has a cure rate of 80% in Australia and more than 90% in Western Australia.

- **Freening resources in the health sector** – improved diagnosis and treatment means reduced demand from gastric patients which frees up valuable clinical and hospital resources for deployment in other areas. In Western Australia, an estimated A$200,000 a year is saved in the cost of hospital admissions and long-term care for peptic ulcer patients alone.

- **Increased productivity** – improved health standards minimise lost productivity and reduce the high cost of absenteeism for employers and the economy.

“Health has an enormous impact on social and economic development worldwide. Nothing is more important than health for the individual and for the whole of society. A concerted global strategy of all stakeholders from academia, industry, politics and civil society is required to tackle current and future challenges to health on a global scale.”

*Berlin Declaration on Ebola, World Health Summit 2014, Berlin, Germany*
Stepping up the fight

Antibiotic resistance is a growing health problem which affects the efficiency of *H. pylori* treatment. Triple and quadruple antibiotic resistant strains of *H. pylori* are emerging, particularly in China, and *H. pylori* cure rates using standard therapies have dropped below 70% in many European countries.

The pressure is on for researchers to find new and better treatments and Marshall is leading the way with customised drug treatment programs and quadruple drug therapies tailored specifically for patients with antibiotic-resistant strains of *H. pylori*. Marshall’s unique ground-breaking work in personalised drug therapies is reaching cumulative cure rates of up to 97.7% with antibiotic-resistant patients in Western Australia.

“Antibiotic resistance is an increasingly serious threat to global public health that requires action across all government sectors and society.”

*The World Health Organization*

Rock star welcome in Korea

Professor Marshall was dubbed the “rock star scientist” when he visited the Republic of Korea in 2011 to celebrate 50 years of diplomatic relations with Australia.

It was his first trip in five years but the Korean people had not forgotten the high profile advertising campaign in which he encouraged them to drink probiotic yoghurt to help stamp out *H. pylori*.

The campaign struck a chord as Korea has one of the highest rates of gastric cancer in the world. Up to 50% of children under 10 years are infected with *H. pylori*. Discussions with yoghurt manufacturer “Korea Yakult” explored the potential for using genetically modified *H. pylori* in food to deliver vaccines straight into the stomach. The concept is now in development at the Marshall Centre.

Marshall participated in an Eminent Scientists’ Roundtable and signed a Memorandum of Understanding with the Korea Research Institute of Bioscience and Biotechnology. This was reciprocated in 2007 when the South Korean Ambassador, His Excellency Mr Shu Chang-beom, made his first official visit to Western Australia. The Barry Marshall Daejeon Scholarship was also introduced to assist top high school graduates from Korea’s prestigious Daejeon Science High School to study at the University of Western Australia.
Tibetan monks saved from ancient pain

Australian charity worker Maureen Fallon and her Tibetan Australian colleague Sonam Rigzen travelled to Australia for 20 years drawing attention to the political plight of refugee Tibetan Buddhist monks.

Maureen noticed that gastric pain was endemic in the Tibetan refugee community. She organised a pilot testing project with support from Marshall and scientists from Australia. This found that more than 80% of the monks were infected with H. pylori. A public health and hygiene campaign was implemented to encourage handwashing before meals and the monks were successfully treated with antibiotics.

Now attention has turned to the development of a gastric clinic in the Himalayas to treat other Tibetans suffering from the ancient affliction of H. pylori which they call Phowa.

"It’s been life changing," said Maureen in an interview with the ABC’s Foreign Correspondent.

"We’re not in this to win medals. We’re Australian. We’re in this to build dunnies. And indeed that’s what we’ve done.”

The documentary “Gut Instinct” aired on the ABC on 1 June 2010.

ADFA in Madagascar

As Patron of the Australian Doctors for Africa, Marshall and his colleague Dr Digby Cullen were recognised for their commitment to seeking solutions to gastrointestinal diseases in Madagascar. They were respectively named Commandeur de l’Ordre Nationale and Officier de l’Ordre Nationale by the Australian Ambassador to Mauritius Ms Susan Coles.

“Before 1982, we believed that gastritis was an interesting but mysterious disease and a challenge for research and knowledge, nothing more. The discovery changed my life and economically worldwide, Barry and Robin’s discovery has meant enormous savings in costs of health care, I estimate this to be billions and billions. This money is still in health care of course. Now, practically all gastric surgery, except that for cancer, is unnecessary and even unethical.”

Professor Pentti Sipponen
Head of Pathology, Jorvi Hospital, Espoo, Finland
World’s first eradication program

Japan became the first East Asian country to make a national commitment to eradicate *H. pylori* when it announced, in 2013, that its national health insurer would fund treatment for all infected citizens.

For half a century the nation had been grappling with a gastric cancer epidemic that was killing more than 50,000 people a year. Gastric adenocarcinoma was the nation’s biggest cancer threat.

A mass x-ray screening program was introduced in 1953, followed by more sophisticated endoscopic screening, but for many cancer victims diagnosis and treatment came too late.

Marshall and Warren’s discovery changed the nation’s strategy. Their visits helped raise awareness of *H. pylori* with clinicians, academics, government and the public. New collaborative networks were formed and new policies emerged.

Instead of focusing on those at immediate risk of cancer, Japan now provides subsidised preventative treatment for anyone infected with *H. pylori* regardless of whether or not they are sick. More than 130,000 cases are diagnosed annually and the nation’s gastric cancer epidemic is expected to be gone within 10 years saving many lives and A$1 billion in healthcare costs.

Japan’s approach sets an important model for other East Asian communities, most of which have exceedingly high rates of *H. pylori* infection. Momentum is now gathering in Korea and China, home to half the world’s gastric cancer deaths.
The 2005 Nobel Prize in Medicine has thrown open Western Australia’s doors to the international science market. Improved patient treatment has reduced pressure on the State’s health resources and spawned a whole new bio-medical industry strengthening the competitiveness of existing enterprises and attracting millions of dollars in domestic and overseas investment.

Once considered lone voices in the medical wilderness, Marshall and Warren have challenged the narrow conventions of traditional scientific review encouraging fresh thinking and an open-minded approach to new ideas.

The colourful professors have attracted a worldwide following inspiring innovation and growth in both academic and commercial spheres. A new wave of scientists and graduates have moved into infectious disease-related research and basic clinical investigation has translated into promising new products that deliver both social and economic benefits for the community.

The Marshall Centre Helicobacter Research Laboratory is at the forefront of emerging fields such as genomics, bioinformatics and big data. Marshall was the first person in Australia to publish his personal DNA on the internet. The Centre leads numerous academic and clinical collaborations across Australia, the USA, Europe and Asia.

Knowledge sharing is facilitated by the Marshall Centre’s outreach program which has set up specialist *H. pylori* research laboratories at international universities supported by postgraduate student exchange programmes giving top science and medical researchers the opportunity to work with Marshall in Western Australia.

Investigations include the use of microelectronics to develop a tiny diagnostic pill and using safe *H. pylori* extracts to combat allergies.

Creating the right investment settings is also critical and Marshall was the first to bring the issue of Employee Share Option Schemes to the attention of WA’s Technology and Industry Advisory Council. Previously, taxation often discouraged the employees of innovation and technology companies from taking up share options. The Federal Government has since moved to adjust the Employee Share Option Schemes to support innovative start-up companies.
Leadership in Science activities
October 2005 to 30 June 2016

- 285 Student activity
- 347 Professional development
- 395 Advisory
- 830 Collaborative

H. pylori papers published each year worldwide 1984-2014
Source: Scopus

Photo: Frances Andrijich
Marshall Centre Helicobacter Research Laboratory

**Malaysia (Scientific-Academic)**
University of Malaya Marshall Centre - genomics and proteomics

**Singapore (Scientific-Academic)**
Nanyang Technological University - fly microbiome, genomics

**USA (Scientific-Academic)**
Vanderbilt Digestive Diseases Research Centre - CagL and gastric cancer project
University of North Carolina - anorexia nervosa and gut metagenomics
Pennsylvania State University - *H. pylori* genomics

**China (Commercial, Scientific-Academic)**
Infagen Pty Ltd - consultancy
Shenzhen Enzyme Co - Sino-Aus Translational Medical Centre and Hongmed-Infagen joint venture company linked to Dapeng Hospital - diagnostics
Nanjing Newtown Science and Technology Park and Nanjing University – establish Nanjing Marshall *Helicobacter pylori* Research Co Ltd. - Personalised medicine
Six hospitals (Shenzhen, Nanjing, Wuxi, Jiangyin, Chengdu, Guiyang) and Jin Yu pathology labs assisting - eradication of *Hp* in China project including collection of 20,000 sample sets
Sun Yat-sen University - novel drug discovery
Peking University - clinical treatment protocols and book
Sichuan University - establish West China Marshall Centre for Infectious Diseases - clinical research and novel drug discovery
Zhengzhou University - personalised medicine

**Japan (Scientific-Academic, Other)**
Book with Hidekazu Suzuki
Keio Medical Prize
Japanese *Hp* Consensus (shaped national treatment policy)
HOPE meetings

**Indonesia (Other)**
Eijkman Institute - AIM-Hi initiative via DFAT and UWA

**Europe (Scientific-Academic)**
Ghent University - genome sequencing
Sanger Institute - Dengue genomics
Gothenburg - biomarkers for gastric cancer
LMU-Muenchen - exchange

**Singapore (Scientific-Academic)**
Nanyang Technological University - fly microbiome, genomics

**Japan (Scientific-Academic, Other)**
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Vanderbilt Digestive Diseases Research Centre - CagL and gastric cancer project
University of North Carolina - anorexia nervosa and gut metagenomics
Pennsylvania State University - *H. pylori* genomics

**China (Commercial, Scientific-Academic)**
Infagen Pty Ltd - consultancy
Shenzhen Enzyme Co - Sino-Aus Translational Medical Centre and Hongmed-Infagen joint venture company linked to Dapeng Hospital - diagnostics
Nanjing Newtown Science and Technology Park and Nanjing University – establish Nanjing Marshall *Helicobacter pylori* Research Co Ltd. - Personalised medicine
Six hospitals (Shenzhen, Nanjing, Wuxi, Jiangyin, Chengdu, Guiyang) and Jin Yu pathology labs assisting - eradication of *Hp* in China project including collection of 20,000 sample sets
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Extending research boundaries

Marshall has created a hotspot for *H. pylori* (*Hp*) expertise in Perth. His interests have expanded with his team to cover projects as diverse as:

- **Genomics** – identifying genes responsible for antibiotic resistance, new diagnostic tools and understanding pre-historic migration to Australia.
- **Epidemiology** – determining the major transmission routes for *Hp* infection in children.
- **Molecular biology and biochemistry** – manipulating genes to understand *Hp* and develop future treatments.
- **Clinical research and clinical microbiology** – improving diagnosis and treatment particularly for antibiotic-resistant patients.
- **Immunology** – identifying markers for early diagnosis of gastric cancer and understanding how *Hp* suppresses the immune system for managing allergies.
- **Antibiotic resistance** – leading the fight against one of the most pressing public health issues in the world today.
- **Vaccines and drug design** – studying how the immune system responds to *Hp* to help develop new drugs and vaccines.

Applying expert knowledge

The team partners with other research groups at the Marshall Centre and around the world. They have applied the skills developed on *H. pylori* to the battle against many other diseases, such as:

- **Clostridium difficile** – an antibiotic-resistant micro-organism rated as an urgent threat by the US Centre for Disease Control.
- **Dengue virus** – a significant health problem for many of Australia’s tropical neighbours.
- **Neisseria meningitidis** and **Neisseria gonorrhoea** – understanding the bacteria that cause meningococcal sepsis and gonorrhoea.
- **Otitis media** – a common health problem in children especially in Indigenous populations.
- **Multiple Sclerosis** – an investigation into whether *Hp* protects patients from MS.
- **Salmonella enterica serovar Typhimurium** – studying the epidemiology of a gastroenteritis outbreak to help prevent future incidents.
Global collaboration

More than 50,300 research papers have been published about *H. pylori* since 1984. Specialist *H. pylori* research centres and laboratories are now being set up in universities and teaching hospitals internationally with support from the Marshall Centre outreach program. A talent exchange program gives postdoctoral research and clinical students the opportunity to work at the Marshall Centre in Western Australia.

Marshall travels to primary collaboration sites at least once or twice a year. An affiliate Marshall Centre has been established at the University of Malaya with funding of A$5 million. Three other centres operate in China, with more planned, along with potential hubs in Indonesia, the Philippines and South America.

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<tr>
<th>LOCATION</th>
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<tr>
<td>University of Queensland</td>
<td>Testing anti-microbial activity of a modified metronidazole compound on metronidazole resistant <em>H. pylori</em> strains</td>
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<td>University of New South Wales</td>
<td>Typing of Australian <em>Salmonella</em> typhimurium and <em>E. coli</em> outbreak strains (genomics)</td>
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<td>Sun Yat-sen University in Guangdong, China</td>
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China the biggest frontier

China is the next great frontier for *H. pylori*. Twenty per cent of the world’s population lives here and more than 500 million Chinese are infected with the disease.

A regular visitor, clinician and guest lecturer to China since 2006, Marshall began taking Mandarin lessons in 2008 to further the relationships that have since spawned major scientific collaborations. Now, laboratory franchises are being set up with the UWA Marshall Centre and WA’s intellectual property is being used to develop new diagnostic and treatment products for billions of *H. pylori* sufferers in Asia.

Memorandums of Understanding have been signed with six Chinese universities and two have been implemented. The new Zhengzhou Treatment Centre is located in the world’s largest hospital (7000 beds) with plans to treat about 30 million people.

The West China-Marshall Research Centre for Infectious Diseases in Huaxi Hospital, Chengdu, is working to develop new drug treatments and screening Tibetans for a study into human migration.

Marshall holds honorary professorships at eight Chinese universities and is a Foreign Member of the Chinese Academy of Engineering. In 2014, he received a Friendship Award from the prestigious Sun Yat-Set University. The award is China’s highest honour for foreign experts who have contributed to the country’s economic and social progress.

Proposed future research joint ventures will give *H. pylori* researchers access to the university’s supercomputer which is one of the biggest on earth.

“Your medical research has given great hope and also improved the quality of life for millions of Chinese people with stomach illness, including my son. For China, your contribution is much larger than the iron ore imported from Australia and lots of people share the same point of view with me.”

Professor Liu, Chinese Academy of Science, Nov 2014
Knowledge, curiosity and critical thinking are the building blocks for a vibrant research sector and encourage new patents, products and industries. Yet uptake of science education has been waning in Australia. Investment in research and training has been low by international standards and the level of engagement between science research and industry has been slated as one of the worst in the world.

Western Australia’s Ambassadors for Life Sciences have worked tirelessly encouraging the whole community – from parents and school children to science professionals, policymakers and investors – to look to a science future.

Since the 2005 Nobel Prize award, State and Federal Governments in Australia have committed millions of dollars to motivate primary and secondary students to take up science, engineering, maths and technology (STEM) subjects. By showcasing great careers built on STEM, they aim to increase the number of young people pursuing these subjects in higher education and secure Australia’s future competitiveness.

In the spirit of Alfred Nobel, who wanted to use his prestigious award to foster rather than honour achievement, Marshall and Warren have leveraged their colourful story to challenge stereotypes and make science popular, thereby actively contributing to Australia’s progress as a knowledge-based economy.

The Australian Society for Medical Research (ASMR) encouraged Marshall to share his experience with Australia’s scientific community when it awarded him the 2011 ASMR medal and sponsored a national lecture tour.

Marshall is a strong advocate for the development of young engineers and scientists. As vice-patron of the STEM-WA Steering Committee, he seeks to bring together Federal Government and private sector funding and to be a point of contact for engagement with schools. This ensures a pipeline of talent and skill will be available to support the future economic development of Western Australia.
International education is Australia’s third biggest export earning A$19 billion per annum.

Universities contribute ~10% to Australia’s economy and ~11% of economic output is derived from advanced sciences.

Australia has 5 universities in the world’s top 100 but is the last of 34 countries for collaboration between industry and academia.

One-third of international graduates come from China - 153,000 in 2014.

Australia produces 3-4% of the world’s knowledge from 0.3% of the world’s population.

225 students from 56 nations have graduated from the UWA Marshall Centre teaching program generating >A$1 million annually in fees.

2 international students generate 1 full-time job and 1 job in academia creates 4 jobs elsewhere in the economy.¹

¹ The Economic Implications of Fewer International Higher Education Students in Australia, Australian Technology Network of Universities August 2010
Tertiary and higher education

The tertiary education sector is an important contributor to Australia’s economy and the opportunity to study under a Nobel Laureate is a major drawcard for both domestic and fee-paying international students.

The Marshall Centre, in partnership with the University of Western Australia, runs one of the world’s most prestigious postgraduate programs in infectious diseases. Elite students from around the world compete for the opportunity to do a research project in a Nobel Laureate’s laboratory and advance their training in medicine, microbiology and emerging new fields, such as genomics and super-computing.

The program accommodates up to 70 local and international students in Graduate Diploma, Doctor of Philosophy or Master of Infectious Diseases courses. More than 225 students, from 56 nationalities, have graduated since 2007. Most of these professionals return home to share their new-found knowledge encouraging collaborative relationships to spread far and wide.

UWA now ranks in the world’s top 100 universities. As part of its centenary celebrations, in 2013, it listed Marshall and Warren’s work on H. pylori as one of its 100 treasures of all time.

International exchange

The reputation of Western Australia as a global science hotspot has been bolstered by the Marshall Centre’s international collaborations and the Nobel Laureates’ frequent appearances overseas.

Figures released by the Australian Government in 2016 showed there were 500,000 fee-paying foreign students in the country. The international education sector adds A$19 billion to the Australian economy each year and supports 130,000 jobs. Almost one-third of all enrolments are from China.

“...many of the strengths of our education system in general in Australia (including strengths that benefit domestic students) derive from years of engagement with and support for migrants and international students coming to this country.”

Stephen Connelly, Former President, International Education Association of Australia, 2011

Speaking our language

More than 2000 delegates, including Chinese Vice Premier Madame Liu Yandong and university presidents from around the world, turned out to hear Professor Barry Marshall deliver his first public address in Mandarin.

The occasion was the opening ceremony of the ninth Global Confucius Institute Conference in Xiamen, China, where the Confucius Institute at the University of Western Australia was named “Institute of the Year 2014”. The non-profit group is part of a network of 475 institutes in 126 countries dedicated to strengthening cultural and educational ties with China.

Marshall won resounding applause as he spoke about his interest in Chinese culture and his experience learning the language.

A regular visitor, clinician and guest lecturer in China since 2006, Marshall began taking weekly Mandarin lessons in 2008 to foster the ties that have since spawned major scientific collaborations between China and Western Australia.

The Confucius Institute has 3.45 million students. The Institute at UWA is the first in Australia and one of only 25 worldwide to receive the prestigious annual award.
Primary and secondary

The 2005 Nobel Prize shone the spotlight on two hard-working Australians who challenged convention and overcame the odds to become the best in the world in their field.

It is a brilliant story and for more than a decade these elite scientists have used their personal experiences to engage and inspire students of all ages.

As teachers, parents and grandparents themselves, they have proven to be popular and accessible role models touring schools and addressing community groups around the world to demonstrate that science is powerful, important… and most of all fun.

Nowhere have they been more prominent or more effective than in their own Western Australian backyard. Marshall is a patron of STEM-WA, a Government-sponsored campaign promoting community education and engagement in science, technology, engineering and maths.

“As a world renowned scientist you have gained such great achievements in the field of medicine that many Chinese people are very familiar with you.”

Xu Lin, Chief Executive
Confucius Institute Headquarters, Beijing
“There once was a Man who Swallowed a Germ”

Year 4 students from Rostrata Primary School, in Perth, produced an e-book after conducting their own research into the *H. pylori* discovery.

“The children love everything about the professors and will remember them forever. We are going to let all Australian schools know how to create e-books easily and the spin-off from our work may help raise levels of literacy. Thirty-two people don’t often write a book together, I hope you enjoy their first effort.”

Richard Johnson, Teacher, Rostrata Primary School, WA
Winner 2013 Prime Ministers Prize for Excellence in Science Teaching in Primary Schools

The ‘Helicopter’ bug mascot was developed to help tell the *H. pylori* story in a way that would be interesting for children and easy for them to understand.

Bacterionomicon is a crowd-funded card game and fantasy artbook inspired by the battle against *H. pylori*. Designed for medical professionals and sci-fi fans alike, it traces the epic struggle as the Apothecary Healers (antibiotics) take on the Lords of Pestilence (infectious disease).

An avid inventor and self-confessed electronics “geek” Marshall showed his homemade Geiger Counter to high school students at a speed meet organised by the Clunies Ross Awards. Administered by the Australia Australian Academy of Technology and Engineering, the awards recognise individuals who have made an outstanding contribution to the application of technology for the benefit of Australia.
Student stories

Dear Barry,

I just came across a photo that reminded me how a short meeting with you back in Queenstown inspired me a great deal as a science educator. I now work in science education research and work with schools, non-profits and government institutions and regularly tell my own version of your story and how it presents scientists as creative, determined and adventurous people. I hope you know how much you inspired me and many others.

Chris Clay, Science education consultant, Auckland, New Zealand, 2015

One day, I hope to approach medicine with the same luster and curiosity with which you do today. Your work is inspiring, especially as it can be distilled into a theme prevalent to life in general; do not give up when you know you are right … one day I hope to be as influential as you are now, solely through desire to success and hard work.

Wyatt Koma, High School Student, Pennsylvania USA

I am 16 years old and sciences are my passion, I’m writing to you to express my admiration and my enthusiasm for your scientific personality and for your works, your creations.

Martina Lopez, France

I am very interested in science and have been learning about the great scientific discoveries throughout history. Your accomplishments and discoveries as a Nobel Laureate are amazing and very interesting to me.

Jason Kobe Schwartz, aged 11, UK

I was not alive when you found the cure but I still take great inspiration from it. With this inspiration, I hope to become some sort of doctor or medical expert to help people with deadly or life threatening illnesses … Being someone like you is my goal in life and I plan to stick with that goal throughout my life.

Jacob Wolf, student, USA

Since I am interested in and studying medicine I know and admire you as one of the great scientists of our time.

Philipp Kochheim, Germany

Thanks a lot for your braveness to do it! You saved a lot of people, we are proud to live on one land with you!

Andrey and Eugenia Smirnova, Russia

I look forward to teaching my two sons all the wonderful achievements made by superb individuals like yourself and how one person can make such a profound and meaningful difference to the world.

Andrew McCormack, Germany

“Life is changing so fast in the 21st Century, so many of you will end up taking a career which may not have been invented yet.”

Professor Barry Marshall speaking to the Challenger Program
The State of Western Australia was quick to recognise the potential for its first Nobel Laureates to create social and economic value far beyond improved health outcomes.

For more than a decade, the Laureates have leveraged their high profile and media presence to challenge conventional thinking and fuel community debate on topics as diverse as human embryo therapy, animal experimentation and cigarette packaging. In 2013, a 30-year-old murder conviction was overturned and a man walked free on the strength of Marshall and Warren's discovery and Marshall’s advocacy.

Their value stems from the high esteem in which they are held around the world not only because they received science’s most prestigious award but because their leadership has inspired curiosity, innovation, discussion and investment in many fields.

In addition to Marshall’s teaching and patient workload, Marshall and Warren’s duties as Western Australia’s first Ambassadors for Life Sciences have been a primary focus, with Marshall taking the lead as Warren officially retired in 1999. Their mission was to promote and inspire scientific talent and achievement by sharing their journey to the Nobel Prize while continuing their own scientific work and building an international network of infectious disease researchers.

It soon became evident that their contribution as leaders, advocates and role models would have far wider implications. The Laureates have been instrumental in saving thousands of lives, creating a new research industry that generates millions of dollars in funding and investment, redefining clinical practice and public policy and building credibility and awareness of the Australian brand overseas.

Leadership in Community activities
October 2005 to 30 June 2016

“Now Barry and Robin have already helped millions of people, in Australia and worldwide ... Their contribution to human health, comfort, and productivity is incalculable.”

Finalist announcement, Australian of the Year Awards 2007
Dr Warren makes the point as he takes the fight against Helicobacter to the streets of Rome.
Advocacy and influence

In 2014, Barry Marshall was named the world’s most popular living Nobel Laureate – more popular than Albert Einstein, according to research by the Nobel Foundation. A Google search on his name returns a million hits.

Marshall and Warren’s success in building strong public ties reflects a deliberate strategy to make the Nobel Prizes relevant to the community. Creating opportunities for the scientists to mix and mingle and talk about their work has helped cement their popularity and consequently the trust and influence they have with the community.

As a result of their leadership they are respected and authoritative contributors to scientific and community conversations and their views on a wide range of issues are widely reported, from the floor of Parliament to the airwaves of talkback radio and social media. As an ambassador for science and innovation globally, Marshall is constantly promoting Western Australia’s geography and climate as great features to attract future researchers to work in the State and enticing overseas investment to follow.

Marshall is Patron and adviser to many organisations who value his international profile and ability to give them a prominent voice. He has met with world leaders, dined with royalty and mixed with celebrities and decision-makers around the world.
Murder conviction reversed

The Western Australia Court of Criminal Appeal set aside a 30 year-old murder conviction on the strength of Marshall and Warren’s groundbreaking medical research that proved ulcers were caused by bacteria not stress.

Chris von Deutschberg, formerly Christian Wilhelm Michael, was a homeless 18 year-old in June, 1983, when he broke into the Scarborough home of 86 year-old Stavros Kakulas looking for money and food. The men scuffled and Kakulas suffered bruising and two broken ribs. He died a week later.

The prosecution’s forensic pathologist Donald Hainsworth said the cause of death was internal bleeding from an acute duodenal ulcer which was “caused directly” by the assault. At the time, the view that stress caused ulcers was widely accepted as medical fact.

The accused was sentenced to life imprisonment and served seven years before being released on parole in 1990.

Marshall wrote to the WA State Solicitor’s Office in 2007 providing crucial medical evidence to prove that the assault did not contribute to, or accelerate, the development of Kakulas’ duodenal ulcer.

After spending his life under the shadow of a murder conviction, Deutschburg walked out of court a free man in 2013.

“People blamed stress because they couldn’t think of anything else,” said Marshall at the time.

“We have been seeking for an opportunity to get in touch with you and to express our gratitude for your service to medicine and culture of peace as well as for your public activity, which we know and much appreciate in Russia. Your opinion is very important for us and for our work intercultural reconciliation.”

Vladimir Ionesov, Chairperson Samara International Society for Cultural Studies, Russia

“They open doors for Australia and make Australia’s creative and intellectual assets more visible to other countries. They improve our reputation internationally as a centre for learning, research and innovation.”

Professor Alan Robson Chair, Group of Eight Universities Australia 2010
Building the national brand

The Nobel Laureates play an important role in boosting Australia’s profile and university rankings in the international market.

The immediate past Executive Director of Australia’s Group of Eight Universities, Mike Gallagher, described winning a Nobel Prize as “advertising that money can’t buy”.

Marshall and Warren’s combined media coverage has an estimated value of A$10.85 million a year, based on the cost of purchasing the equivalent advertising space. But the true value of the publicity and news coverage they have earned for Australia and its impact on the nation’s image and reputation is far higher.

Media outlets around the world have been drawn to Marshall and Warren’s exploits and their story has appeared in the world’s top newspapers, magazines, on television and radio news, in films and in books. A highlight was the release of the Hollywood blockbuster movie Contagion which quoted Marshall by name and referred to his self-experimentation as a source of inspiration. Marshall also has a strong online presence and is active on social media.

An ABC film, The Winners Guide to the Nobel Prize, followed Marshall and Warren for a year after the Nobel Prize award. The production was broadcast internationally and won numerous awards for documentary filmmaking and outstanding science communication.

UWA’s position in the Academic Ranking of World Universities

The 2005 Nobel Prize had an immediate uplift on UWA’s position in the Academic Ranking of World Universities (ARWU, formerly Shanghai Jiao Tong).

Source: Shaun Wellbourne-Wood 2011

“Research shows that Australia is one of the world’s most admired nations. We are famous for our beautiful and productive natural assets, and Australians are considered warm, trustworthy and capable. But Australia’s reputation for innovation, creativity, technology and science is not as good as it deserves to be.”

Building Brand Australia, 2011

Marshall and Warren were showcased in this whole-of-government campaign lead by Austrade promoting Australian export trade, investment and education.
Industry and entrepreneurship

The profile and leadership of Western Australia’s Nobel Laureates has delivered an important boost to the Western Australian economy helping to free-up healthcare resources, increase education income and create exciting new opportunities for the State’s scientists and fledgling bio-medical industry.

According to the Australian Government, businesses that collaborate on innovation with research organisations are three times more likely to experience productivity growth, improved sales and exporting activity. Marshall has been a staunch advocate of this point of view. His entrepreneurial drive has attracted millions of dollars in research and investment funding to investigate and commercialise new diagnostic and treatment products with substantial export potential. He is the founder of two leading research and development companies based in Western Australia and has been instrumental in establishing a range of commercial joint venture projects overseas.

Launching a new industry

Demand for H. pylori-related products is expected to be enormous over the next 30 years creating a firm platform for Western Australia’s bio-medical industry and strong incentive for new entrants into the market. Established international relationships give WA suppliers direct access and credibility in emerging markets, particularly those heavily affected by H. pylori. These include China, where 50% of the population is infected and India, where up to 80% of rural populations are infected, as well as other heavily populated markets in the Asia-Pacific, South America and Africa.

Commercialising products

Western Australia is the centre for intellectual property development and international marketing and distribution of H. pylori-based products. Australia’s leadership in H. pylori research has created significant commercial opportunities including the establishment of Ondek Pty Ltd, a biotech company which is developing genetically-modified, safe H. pylori-based products to modulate the immune system and manage allergies. Two diagnostic tests developed by Marshall are being commercially manufactured and sold by Tri-med Distributors Pty Ltd. A diagnostic breath test is now manufactured and distributed around the world by pharmaceutical giant Kimberly-Clark.

Attracting investment

As a world class science hub, Western Australia is strengthening its ability to attract funding for research and development from both public and private sources. Since 2006, Marshall has secured research revenue of A$19 million – multiplying the Western Australian Government’s initial investment ten-fold. After securing a commercial ready grant for A$2.5 million and a clinical development grant of A$0.9 million, Ondek Pty Ltd has raised a further A$12 million from private investors.

Creating jobs

Research and development programs at the Marshall Centre provide invaluable training and experience for skilled scientists, medical researchers and computer programmers helping to retain their talent and skills in Western Australia. The Centre is growing world class capacity in areas such as next generation sequencing and genomics and computer programming for big data analysis.
The Nobel Prize announcement is traditionally shrouded in secrecy so Marshall and Warren had less than two hours’ notice that they had won and no time to prepare for the tsunami of international attention that followed.

After the announcement, the pace was frenetic and pressure was intense as invitations, media requests and congratulatory messages poured in from around the globe.

Marshall and his wife, Adrienne, were keen to ensure the whole community benefitted from Western Australia’s first Nobel Prize and that the Laureates’ story was widely shared as an encouragement and inspiration for others.

They set up the Office of the Nobel Laureates (ONL) within weeks and engaged Project Manager Mrs Kris Laurie to coordinate the Laureates’ activities and accompany them on their initial overseas tours. Laurie had worked with Marshall three years earlier developing a major conference in Perth to celebrate the 20th anniversary of the discovery of Helicobacter pylori.

ONL quickly became the central contact point for anyone wishing to communicate with the Nobel Laureates. ONL staff managed their travel, governance, finance and administrative workload. The office also managed their commitments as WA Ambassadors for Life Sciences after the appointment was made by the Western Australian Government in 2006.

Interest in Marshall and Warren continued to build. Each talk they gave generated many more invitations, letters of thanks, stories from people who had suffered and were cured and stories from children who were inspired to study and follow their dreams. The overwhelming response from the public was a reflection of the Marshall’s community engagement strategy and its effective implementation by ONL.

ONL became actively engaged in analysing the social impact and benefits derived from the Laureates’ ambassadorial work. All interactions, correspondence, media stories, events and invitations were carefully documented and extensive databases were coded and stored for historical purposes. The data formed the basis of a Masters thesis by Laurie, one of the first graduates of the University of Western Australia’s Centre for Social Impact.

“Promoting and maintaining a successful brand involves having a team that is professional, organised, friendly and competent so that every interaction is seen to be of a very high standard – in keeping with the profile of a Nobel Laureate.”

Mrs Kris Laurie, Manager Office of the Nobel Laureates
The Office of the Nobel Laureates ceased operations, under Mrs Laurie’s management, on 30 June 2016 after more than 10 years. This small office efficiently coordinated worldwide activities linking the Nobel Laureates with 37 countries and 148 cities. It was the first office of its kind and has provided helpful guidance and support for successive Nobel prize-winners.

Marshall will continue to represent Western Australia as the WA Ambassador for Life Sciences and his activities will be coordinated through the Marshall Centre of Infectious Diseases Research and Training at the University of Western Australia.

ONL responsibilities included:

- Administrative support and scheduling
- Annual and project plan reporting
- Archival and record management
- Brand, risk, project and event management
- Financial management of funds from the Western Australian Government
- Funding and contract negotiation
- Media relations
- Public relations
- Short and long-term contract management
- Staffing and procurement
- Stakeholder relationship management - WA Government, MCHRL, Ondek, Trimed, Chinese collaborators
- Social impact analysis
- Travel, passports, visas, insurance

The ONL team, from left, Jeanette Harrison, Joanne Barram, Kris Laurie, Barry Marshall, Robin Warren and Susie Maluish.

Photo: Frances Andrijich
TAKing the message to the world
Participated in 844 networking events, 202 ceremonial occasions and 395 advisory meetings.

From 2006 to June 30, 2016 ONL has coordinated 6,598 invitations and activity requests and has managed relationships with 6,600 organisations or individuals.

Of these, the Nobel Laureates have:

- Attended 4,409 official engagements – an average of one a day, every day for a decade.
- Made 127 overseas trips and flown more than 3 million kilometres.
- Presented 414 academic, industry or public lectures and student talks.
- Made 489 visits to 148 cities in 37 countries, some visited numerous times.
- Participated in 844 networking events, 202 ceremonial occasions and 395 advisory meetings.

Fast Facts

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Attended 4,409 official engagements – an average of one a day, every day for a decade.
The Marshall Centre for Infectious Diseases Research and Training is a world class facility and continues to be the hub of Marshall’s research and clinical activities in Australia.

Its goal is to translate pure and applied research into new products and practices that can be marketed and distributed for the benefit of patients. The centre is renowned as an incubator for new ideas, applying the principles of Marshall and Warren’s work across scientific disciplines and exploring applications that extend the benefit of their findings, both in human medicine and more broadly, to areas such as agriculture, biodiversity and information technology. Products include new vaccines, diagnostic tests and treatments for H. pylori and other diseases.

The Marshall Centre hosts a huge collection of H. pylori specimens and is developing breakthrough genomic and big-data analysis models using supercomputers to uncover the patterns between genetic variation and disease. A new e-biobank is being developed to make these resources available to researchers worldwide.

Based in Western Australia’s QE11 Medical Centre, the sophisticated facility was established with the help of a A$4 million grant from the Australian Government and incorporates the Marshall Centre Helicobacter Research Laboratory. To date, almost A$20 million in research funding has been generated. This is a 10-fold return on the A$1.9 million seed capital provided by the Western Australian Government.

The centre operates in partnership with the University of Western Australia, which has made it possible for Marshall to keep working with patients and mentoring emerging scientists, while also undertaking his ambassadorial duties for the State.

The Marshall Centre specialises in infectious disease surveillance, diagnostics, discovery and intervention. Its research teams are focused on antimicrobial resistance and drug design with investigations covering Clostridium difficile, parasitic diseases, Neisseria and insect-borne viruses, such as Dengue.

The centre’s education arm provides specialist post graduate training for medical students and hosts visiting international clinicians and researchers. The Master of Infectious Diseases course provides advanced training in topics such as medical microbiology, tropical infectious diseases and public and environmental health microbiology.

“Australian scientists have a tradition of lateral thinking, technical excellence and global outlook.”

*Professor Barry Marshall, 2006*
Highlights

Personalised treatment: saving lives and resources

Marshall continues to treat patients who suffer from antibiotic resistant strains of *H. pylori* and are not cured by standard protocols. Clinical microbiology allows for personalised treatment with a drug combination tailored for each patient. New combination therapies have a cure rate of more than 90%. Curing patients not only improves their quality of life, it also prevents peptic ulcers and gastric cancer, saving the health costs associated with treating these diseases in the future. The economic impact for the period 2006 to June 2015 is a saving of A$18,198,000 to the Western Australian health system.

This graph shows patients cured and cumulative savings in lifetime expected health costs for patients as a result of treatment provided by Marshall and his team, between 2006 to 2015. Follow-up results for 2015 are still being compiled and the final cure rate for the year is expected to reach 97.7%.
New therapy combination boosts success

Research scientists at the Marshall Centre are refining new schedules to provide the most effective drug combination for the treatment of antibiotic resistant *H. pylori*. The new sequential PBRC therapy reduces the time patients are required to take potent antibiotics. This was found to produce fewer side-effects and lower costs than the existing regimen while maintaining a high cure rate.

Targeted treatment limits ineffective antibiotics exposure

The majority of Marshall’s patients also become research subjects and their samples provide valuable raw material for ongoing research.

The World Health Organisation has warned that "antibiotic resistance is an increasingly serious threat to global public health" undermining the ability to combat many serious infections, not just *H. pylori*. Antibiotic sensitivity testing on patients allows drug treatments to be more effectively tailored to suit individual patients. This increases the rate of treatment success and limits the ineffective use of antibiotics which encourages the antibiotic resistance of bacteria.

Contributing to the global knowledge base

The MCHRL and other Marshall Centre research teams continually add to the global knowledge base by publishing papers on topics as diverse as reports of new clinical treatments, to the genomics of *H. pylori* and pathogens such as *Neisseria* and *Clostridium difficile*. This fundamental research is key to the future development of new diagnostic tools, treatments, vaccines and other preventative measures.

The value of international collaboration – MCHRL outreach program

The MCHRL outreach program is rapidly developing in China. More than 700 million people are infected so *H. pylori* is a huge problem and there is growing demand for treatment. The Marshall Centre team has undertaken 13 projects with Chinese collaborators including work with the Hongmed-Infagen joint venture company which is developing a new diagnostic product.

“The damaging effects of antimicrobial resistance are already manifesting themselves across the world. A continued rise in resistance by 2050 would lead to 10 million people dying every year ... (and) cost the world up to 100 trillion USD.”

*UK Review on Antimicrobial Resistance, 2014*
International talent broadens research horizons

Attracting research fellows from around the world has enabled the Marshall Centre to expand its investigations to include the microbiology, epidemiology, molecular biology and increasingly the genomics and other ‘omics of the Helicobacter pathogen. Hypotheses being tested include whether immune system changes in response to H. pylori can be used to fight cancer by identifying the patterns of human antibodies to H. pylori that can act as biomarkers for gastric cancer. Early diagnosis of gastric cancer is vital to prevent the 1200 deaths from this disease that occur in Australia each year.

Building microbiome and metagenomics capability

Building on its capability in sequencing and analysis of large datasets, the Marshall Centre team is developing new projects to investigate the microbiome (combined genetic material of all the microorganisms in a particular environment) of the gut and other areas of the body. Metagenomics analysis allows the typical bacteria, from healthy and unhealthy individuals, to be compared. This new skill set has fed into several new collaborations including the noisy gut and interstitial cystitis projects. A better understanding of the biology underlining these diseases will aid in development of new diagnostic tests and treatments.
Turning the tables on *Helicobacter*

*Helicobacter pylori* encourages a tolerant host immune system to allow long term persistence. Researchers at the Marshall Centre, with colleagues at research institutes across Australia, are using animal studies and human trials to better understand this. In particular, Ondek Pty Ltd researchers are investigating whether they can exploit the immune-regulatory effects of *H. pylori* to manage allergies. The ultimate aim is to bring new therapies to market to control asthma and eczema.

“It would be far better if simple and safe therapies for *Helicobacter* existed ... genomic analysis will fast track our goal of developing new treatments – especially natural and probiotic therapies.”

*Professor Barry Marshall*
Patient stories

I would like to pass this message on to Barry and thank him for saving my life from the savage effects of bleeding ulcers. It allowed me to go on and develop the first 286, 386, 486 and Pentium PCs while working as a Systems Integration Manager and Director of Operations for North and South America with NCR and AT&T Computers. Without Barry’s help this would not have been possible. Also, I was able to start up 25 manufacturing facilities and work in 88 countries all because of Barry’s work. I was just about dead and Barry pulled me out of certain disaster.

Steve F. Gravely,
President The Consulting Group of Jocassee Inc, USA

Just a short message to say thank you, I will be 70 on June 15th this year and it’s been 22 years since I was cured of Helicobacter pylori. 3 weeks of antibiotics. From age 24 - 48 every night waking with terrible acid, having milk and biscuits by the bed, drinking gallons of white chalk medicine for 24 years… now having strawberries and cream! I hope to get over to Australia one day and will call in to the uni café. Many thanks for changing my life and Jen (wife). We live near Twickenham Rugby Stadium, West London, and are sitting here wondering how many thousands of people like me you have helped..

Peter Clephane, UK
"Against prevailing dogmas, you discovered that one of the most common and important diseases of mankind, peptic ulcer disease, is caused by a bacterial infection of the stomach. Your discovery has meant that this disabling condition can now be permanently cured by antibiotics to the benefit of millions of patients.

Your pioneering work has also stimulated research all around the world to better understand the link between chronic infections and diseases such as cancer.

On behalf of the Nobel Assembly at Karolinska Institutet, I wish to convey to you our warmest congratulations, and ask you to step forward to receive the Nobel Prize from the hands of His Majesty the King."

Nobel Prize presentation speech, Professor Staffan Normark, Stockholm, December 10, 2005
Monday 3 October, 2005 was the momentous day when Marshall and Warren received a call from the Nobel Foundation to say they were about to be announced recipients of the 2005 Nobel Prize in Physiology or Medicine. It is a call they had been hoping to receive for 20 years.

As is the custom, the telephone rang just a couple of hours before the international media were alerted and pandemonium broke loose. It was a very popular decision with the media, the public and the medical fraternity as, by then, the story of Marshall and Warren’s struggle for recognition and acceptance was well known.

As they have both said, the discovery was most exciting but the Nobel Prize was the icing on the cake.

During the next three years Adrienne Marshall worked at ONL and accompanied Barry on most overseas trips. Dr Warren’s daughter-in–law Mari Warren frequently travelled with him during those hectic years.

From October to December 2005, the Laureates completed 108 engagements. They visited 10 cities in 2 countries and travelled an estimated 72,150 kilometres.

• Official announcement of Marshall and Warren as Nobel Laureates
• Awarded Keys to the City of Perth
• Nobel week in Stockholm
• Nobel Prize presented to Marshall and Warren by HRH King Carl XVI Gustaf of Sweden
• Fremantle Hospital Nobel celebration and 2006 research awards presentation
• Dinner with the King and Queen of Sweden
• Meeting with Federal Minister for Education, Science & Training Brendan Nelson to discuss support for the Nobel Laureates and establishment of a future Marshall Centre for Infectious Diseases
• State reception hosted by WA Premier Geoff Gallop
A DECADE OF DELIVERY: 2006

After the flurry of the Nobel announcement, 2006 heralded the beginning of the operational era for the Nobel Laureates. The Western Australian Government appointed Marshall and Warren as WA Ambassadors for Life Sciences and funded the Office the Nobel Laureates to support their ambassadorial activities.

Demand for the Laureates was high and they received 657 invitations. Although Warren retired in 1999, he agreed to undertake several overseas tours and local student engagements. Marshall added the new full time commitments as Ambassador and Nobel Laureate to his existing full time job as the world’s leading expert in *Helicobacter* research.

During the year, an agreement was signed between UWA and KRIBB, the Republic of Korea’s only government research institute for biotechnology, and UWA launched the Combined Adrienne Marshall English Scholarship and Marshall Science Scholarship for students at elite high schools in China and South Korea.

In 2006 the Ambassadors completed 472 engagements. They visited 39 cities in 14 countries and travelled an estimated 311,627 kilometres.

- WA Premier Alan Carpenter agrees to provide funding support, Perth
- UWA celebrates the Nobel Prize at Winthrop Hall, UWA Perth
- Australia Post commemorates the Nobel Prize with a special edition stamp release
- Marshall undertakes an extensive lecture tour of China, South Korea, Japan and Singapore
- The Royal College of Pathologists celebrates Warren’s achievements
- Marshall travels to Singapore and USA with Premier Alan Carpenter for the BIO2006 Annual International convention promoting WA’s biotechnology industry
- Warren is keynote speaker at the Focus on Microscopy Conference in Fremantle
- Federal Budget allocates $4m towards establishment of the UWA Marshall Centre for Infectious Disease Research and Training.
- Marshall returns to his birthplace Kalgoorlie, conducting Grand Rounds and a lecture to the Eastern Goldfields Medical Division of General Practice
- Opening of the UWA Confucius Institute, Perth
- Marshall and Warren announced WA Citizens of the Year, Perth
Total invitations: 657
Completed activities: 472
Patients cured: 65
Savings to WA public health: $911,170

Public Health Leadership activities: 179
Scientific Leadership activities: 209
Educational Leadership activities: 143
Community Leadership activities: 207

- Interview with Michael Mosley for the BBC documentary “Horizon”
- Interview for the ABC documentary “How to win a Nobel Prize”
- Lecture tour to Germany
- Marshall is keynote speaker at the Computational Genomics Conference, USA
- Warren is keynote speaker at the University of Hong Kong, China
- MOU signed with the Korea Research Institute of Bioscience and Biotechnology (KRIBB)
- National Press Club address, Canberra
- National Health and Medical Research Council, Canberra
- National Library of Australia plans an exhibition of the Nobel Prize winning discovery
- Marshall and Professor Geoff Shellam announced as co-Directors of the new UWA Marshall Centre, Perth
- Lecture tour to Sweden, Finland and Poland
- Marshall and Warren announced as WA’s Australians of the Year, Perth
- Lecture tour to Japan and Thailand
A DECADE OF DELIVERY: 2007

Two significant milestones marked 2007 as a landmark. The first was the opening of the Marshall Centre. The facility quickly established itself as an international leader in H. pylori and related research under the guidance of co-Directors Barry Marshall and the late Professor Geoff Shellam. A Master of Infectious Diseases course was established by the UWA Faculty of Medicine, Dentistry and Health Sciences attracting students from across Australia and South-East Asia.

An initial meeting with Marshall and WA’s Director of Public Prosecutions, Mr Robert Cock, laid the foundations for a pro-bono case challenging the murder conviction of Chris von Deutschburg (previously known as Christian Michael). This case succeeded in 2013, legally reaffirming that bacteria, not stress, caused ulcers.

Marshall and Warren were awarded the Companion of the Order of Australia, the highest recognition for achievement and service in Australia.

In 2007, the Ambassadors completed 380 engagements. They visited 24 cities in 9 countries and travelled an estimated 272,014 kilometres.

- Marshall tour includes France, Italy, and Cambridge University, UK.
- Marshall and Warren are invested as Companions of the Order of Australia, Australia’s highest civilian award, by the former Governor General Major General Michael Jeffery at Government House, Canberra.
- The Marshall Centre welcomes its first students into the Master of Infectious Diseases.
- Marshall lectures at Kobe University and receives an Honorary degree from Shiga University of Medicine, Japan.
- Discussions in Taiwan, with the Taiwanese President, Senior Ministers and National Science Council, re Hp screening programs.
- Marshall and Raine Professor Doug Berg, University of California, visit WA’s Pilbara.
- Marshall meets Vice Premier of the People’s Republic of China, His Excellency Zeng Peiyan.
- Meeting with WA Government representatives to discuss the Lockhart Review on human cloning and stem cell research.
- Australian of the Year ceremony in Canberra.
- Marshall delivers keynote address to Supreme and Federal Court Judges’ Conference, Perth.
- Lecture tour to USA universities.
- Warren tours Germany.
Marshall advocates for convicted murderer Chris von Deutschberg during a meeting with WA Director of Public Prosecutions Robert Cock.

Marshall attends Science at Parliament, a bipartisan event to assist Parliamentarians to understanding the role of science in WA.

Marshall tours France and Japan.

Filming for TV show “The Most Useful School in the World” in Tokyo Japan.

Warren lectures to the American Society for Clinical Pathology, New Orleans USA.

Marshall and Warren attend the annual Nobel dinner celebration in Canberra hosted by Swedish Ambassador to Australia HE Karin Ehnbom-Palmquist.

Marshall travels to Penn State University, USA, for collaboration discussions.

Marshall, as Patron, attends the opening of the Australian Synchrotron in Melbourne.

Marshall consolidates work with Japanese collaborators at the Keio University of Medicine (KUM), Japan.


Marshall delivers the Neville Stanley Oration and speaks at the DoHad conference, in Perth.

Marshall travels to Abu Dhabi for meetings with the Minister of Health about H. pylori screening programs, in UAE.


Marshall delivers the Neville Stanley Oration and speaks at the DoHad conference, in Perth.

Marshall travels to Abu Dhabi for meetings with the Minister of Health about H. pylori screening programs, in UAE.
International collaboration was emerging as the impetus for WA to achieve its vision for a science-driven future. Lectures took the H. pylori message further afield into dense population centres like India and Indonesia. A Memorandum of Understanding was signed in Russia and scientists met in Belgium to consider alternatives to toxicity testing on animals.

Marshall continued to win hearts and minds in China visiting victims of the Szechuan earthquake and began Mandarin lessons at the UWA Confucius Centre. The first tripartite agreement followed between UWA and medical universities in both China and Japan.

The official opening of the Leaning tower at the Gingin Gravity Museum, cemented Western Australia’s place in the centre of a billion-dollar international project which, in 2016, evidenced Einstein’s theory of gravity waves. This has been described as one of the most important scientific discoveries in history.

In 2008, the Ambassadors completed 370 engagements. They visited 29 cities in 15 countries and travelled an estimated 254,570 kilometres.

- Meeting with Professor Sally Davies, Director of R&D, UPH Department of Health/National Health System, UK
- Interview for new book Australian Greats published by Random House
- Marshall speaks at BIOASIA 2008, India
- Twilight sailing with Swedish Ambassador to Australia Karin Ehnbom-Palmquist
- Launch of Brilliant Science WA, Perth
- Meeting with Indonesian President Mr Susilo Bambang Yudhoyono, Jakarta Indonesia
- Mochtar Riaidy Research Institute symposium, Jakarta Indonesia
- Launch of WA Inventor of the Year Awards, Perth
- 10th anniversary symposium for Australian Genome Research Facility, Melbourne
- Guest speaker at the European Partnership for Alternative Approaches to Animal Testing, Brussels, Belgium
- Lecture to Russian Gastro Association, tour of Kremlin and cultural program, Moscow, Russia
- Interview with Science Time, Beijing China
- Marshall named Honorary Professor, Nanjing University, China
- Visit to earthquake victims, Drum Tower Hospital, China
- Signing of MOU between the Tomsk Regional Administration of the Russian Federation and WA Premier Alan Carpenter, Tomsk Russia
- Marshall delivers the Dean’s Lecture, Penn State College of Medicine, USA

Australia, India

- Meeting with Indonesian President Mr Susilo Bambang Yudhoyono, Jakarta Indonesia
- Mochtar Riaidy Research Institute symposium, Jakarta Indonesia
- Launch of WA Inventor of the Year Awards, Perth

Australia, Indonesia

- 10th anniversary symposium for Australian Genome Research Facility, Melbourne
- Guest speaker at the European Partnership for Alternative Approaches to Animal Testing, Brussels, Belgium
- Lecture to Russian Gastro Association, tour of Kremlin and cultural program, Moscow, Russia

Australia, Russia, USA

- Interview with Science Time, Beijing China
- Marshall named Honorary Professor, Nanjing University, China
- Visit to earthquake victims, Drum Tower Hospital, China

Australia, Singapore, China
**Public Health Leadership activities**
- 496 Total invitations

**Educational Leadership activities**
- 370 Completed activities
- 133 Patients cured
- 129 Community Leadership activities

**Scientific Leadership activities**
- 145 Public Health Leadership activities
- 129 Educational Leadership activities
- 163 Community Leadership activities

**Patients cured**
- 129

**Savings to WA public health**
- $1,272,280

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**Events**

- **JUL**
  - Interview with Dr Norman Swan for Radio National *The Health Report*, Australia
  - Signing of MOU with Nanyang Technological University, Singapore
  - Trilateral agreement signed between Zhejiang University, Kobe University and UWA, Perth

- **AUG**
  - Keynote at Research and Advances Seminar, Princess Margaret Hospital, Perth
  - Address to, Developing Medicines in the Future, London UK
  - Interview with ABC News on therapeutic cloning

- **SEP**
  - Marshall delivers keynote speech at the Royal Australian Chemical Institute Conference, Perth
  - Guest speaker at the John Wollaston Anglican Community School prizegiving assembly, Perth
  - WA Premier’s Science Awards presentation dinner, Perth

- **OCT**
  - Interview with Lia Timson for book chapter on Australian Nobel Laureates
  - Public lecture and meeting with Queensland Chief Scientist and Government Ministers, University of Queensland, Australia

- **NOV**
  - MOU signed with Ondek and Eijkman Institute, Jakarta Indonesia
  - Warren presents to XXVII Congress, International Academy of Pathology, Athens Greece
  - Inaugural Marshall Warren Award for Asia Pacific Digestive Week, New Delhi India

- **DEC**
  - Lennox K. Black Award for Excellence presented to Marshall, Jefferson University, Philadelphia USA
  - Presentation of Marshall Travel Award at Fremantle Hospital Medical Research Foundation Awards, WA
G-Day WA Day, in London, was an important world showcase for Western Australian innovation. Oxford University presented Marshall with an honorary Doctorate in Science and his keynote lecture was widely publicised creating funding opportunities for vital new muscular dystrophy research being undertaken by Dr Steve Wilton, at Murdoch University.

Interest and connections with China continued to build – a reflection of the growing significance of relations with scientists and clinicians involved in *H. pylori* research.

The Professor Marshall Science Encouragement Prize was presented to the top Beijing student entering science at UWA, a public lecture series by Nobel Laureates was named in Marshall and Warren’s honour, and Marshall took the podium at the Australian Parliamentary Conference on Science Innovation.

In 2009, the Ambassadors completed 387 activities. They visited 29 cities in 10 countries and travelled an estimated 412,418 kilometres.
- Delegation from Chinese Academy of Science visits Perth
- Lecture tour for 50th anniversary of the Gairdner International Awards in Toronto, Vancouver and Calgary, Canada
- Filming by Chinese TV for Federal Government initiative Study in Australia 2010 to promote studying at UWA
- Media interviews for Discovery Magazine, ABC, Channel 9 and The Australian on vaccine development
- Launch of The Professor Marshall Science Encouragement Prize for NIT graduates, Beijing China
- Meeting with Foreign Experts Bureau and Ministry of Education, Beijing China
- Marshall named Honorary Professor, Graduate University of the Chinese Academy of Sciences
- Memorial lecture for Niigata University 60th anniversary, Japan
- Filming for Japan’s most popular TV health program, Niigata Japan
- Filming for NIH documentary on Nobel Prize discovery, London UK
- Marshall and Warren named Bragg Members of the Institute of Australia, Adelaide
- Panellists at the Australian Parliamentary Conference on investment in science and research, Perth
- In the Zone conference session on technology in health and disaster management, UWA, Perth
- Research trip to Wiluna, WA
The vision for international research and its potential implications for Western Australia’s biotechnology industry became clear as Marshall delivered the Austrade keynote lecture at the Shanghai World Expo.

In China, Marshall attended the Third Military Medical University in Chongqing to advise on vaccine development. Four years later the product was approved by the Chinese Food and Drug Authority and remains the world’s first and only effective vaccine for H. pylori.

In Italy, Marshall featured at the Bergamo science festival which attracted 100,000 participants from schools and universities around the country.

After five years as Nobel Laureates and WA Ambassadors for Life Sciences the impact of Marshall and Warren’s effort and influence was evident. A strong network was in place and early outreach strategies were delivering results.

In 2010, the Ambassadors completed 401 engagements. They visited 22 cities in 10 countries and travelled an estimated 229,320 kilometres.
**Public Health Leadership activities**
- 601 Total invitations

**Scientific Leadership activities**
- 401 Completed activities
- 162 Public Health Leadership activities

**Leadership activities**
- 107 Patients cured

**Educational Leadership activities**
- 187 Community Leadership activities
- 178 Patients cured

**Community Leadership activities**
- 1,671,546 Savings to WA public health

**Patients cured**

**Savings to WA public health**

**Total invitations**

**Completed activities**

**Leadership activities**

**Australia, Malaysia, China**
- Local activities in Perth
- BBC interview

**Australia, USA, The Netherlands, Thailand, Hong Kong**
- Marshall delivers Wally Neal Oration, Australian College of Educators, Perth
- Interview with Nick Goldie, Australian Scientist, Perth
- Interview for Innovation Nation, by Lia Timson
- Meeting with Professor Vanessa Hays about genomics collaboration, Perth

**Australia**
- Meeting with Attorney General Christian Porter about von Deutschburg conviction
- Speech to Australasian Association of Clinical Biochemists and Australian Institute of Medical Scientists, Perth
- World of Voices projects, Nobelprize.org
- WA Science Awards presentation, Perth
- Meeting with Professor Takeshi Sano, from the National Cancer Institute of Japan, in Perth
- Planning with Australian Society of Medical Research President Emma Parkinson-Lawrence ahead of ASMR Medallist tour in 2011.
- Civic reception celebrating charter of friendship between Chengdu City and Perth with Lord Mayor Lisa Scaffidi, WA
- Keynote address at IASP-ASPA joint conference
- Launch of Helico forum, an online global resource for patients
As the Australian Society of Medical Research’s 50th anniversary Medallist, Marshall toured Australian capital cities in pursuit of ASMR’s mission “to promote community understanding and support for health and medical research through public, political and scientific advocacy”.

Marshall’s lectures emphasised the importance of genomics as a new frontier of medical research with impacts and benefits estimated at one trillion US dollars.

In Canberra, Marshall addressed the National Press Club and broke new ground on the front page of the Sydney Morning Herald newspaper by announcing he would be the first Australian to publish his personal human genome on the internet.

In 2011, the Ambassadors completed 415 engagements. They visited 28 cities in 13 countries and travelled an estimated 275,789 kilometres.
Public Health Leadership activities

Scientific Leadership activities

Educational Leadership activities

Community Leadership activities

- Launch of National Science Week, Perth
- Australia-American Leadership Dialogue, Dept of Premier and Cabinet, Perth
- Marshall’s Science Cafe talk to year 9-11 students, UWA, Perth
- Inaugural Perth Next Generation Sequencing Special Interest Group meeting, Perth
- Interview with The West Australian re food based vaccines, Perth
- Ceremony for Commonwealth Heads of Government Meeting (CHOGM), Perth
- State reception for Her Majesty The Queen and Duke of Edinburgh, Perth
- Graduation lecture at University of Melbourne, Melbourne
- WA Science Awards, Perth
- Presentation of Tall Poppy Award, Perth

- Warren presents at Overcoming Barriers conference, Sydney
- Meeting regarding clemency for von Deutschburg, Perth
- Collaboration meetings and lectures, Singapore and Malaysia
- Meeting with former British Prime Minister Tony Blair re Faith and Globalisation Initiative, Perth
- Marshall studies advanced mathematics, Imperial College, London UK
- Meeting with Founder of Britain Nepal Otology Service Mr Neil Weir, London UK
- Dean’s Lecture, Peking University, Beijing China
- Opening lecture at BergamoScienze, Bergamo Italy
- Lecture at Korean Academy of Science and Technology, Hanyang University and Pohang Institute of Science and Technology, South Korea
- Marshall delivers Presidential lecture at the Clinical Oncological Society of Australia meeting, Perth

- Australia, Malaysia, Singapore
- Australia, UK, Ireland, China, Italy
- Australia, South Korea, Spain
- Australia, Japan
- Australia, New Zealand

Total invitations: 576
Completed activities: 415
Patients cured: 135
Savings to WA public health: 2,186,460

Public Health Leadership activities: 169
Scientific Leadership activities: 220
Educational Leadership activities: 158
Community Leadership activities: 158
A DECADE OF DELIVERY: 2012

Australia’s prominence as a leader in science communication had its roots at the 2012 Cheltenham Science Festival, UK where Marshall accompanied WA Chief Scientist Professor Lyn Beazley. Marshall gave numerous media interviews, featured in the BBC 4 science comedy program *Infinite Monkey Cage* and met with international delegates to discuss the challenges of communicating science to the public.

The *Helicobacter* message continued to build momentum bringing Marshall to an audience with HRH Princess Sirindhorn of Thailand, participating in the launch of the Perth US-Asia Centre by US Secretary of State Hillary Clinton and an economic mission to Perth headed by HRH Prince Phillippe of Belgium. The Marshall Centre published its first major paper on novel therapies to fight antibiotic resistant infection.

A $2.5 million state-of-the-art medical teaching facility opened at the University of Adelaide was named after one of the University’s most illustrious medical graduates - Emeritus Professor J. Robin Warren AC.

In 2012, the Ambassadors completed 418 engagements. They visited 31 cities in 10 countries and travelled an estimated 242,216 kilometres.

**January**
- An audience with HRH Princess Sirindhorn and keynote speaker at the Mahidol International Conference on Chronic and Oncogenic Infections, Bangkok Thailand
- Meeting with Dr Ken Henry regarding Australia in the Asian Century whitepaper
- Discussion with Dept. of Commerce about IP issues and strategic policies, Perth WA

**February**
- Awards presentation, Zhejiang Association of Science & Technology, Hangzhou China
- Lecture at world Vaccine Congress, Washington USA
- Speech at AGA & Bill and Melinda Gates Foundation conference on the impact of *H. pylori* on children in developing countries, Seattle USA

**March**
- Paint a frog to be auctioned off as an Autism Awareness Day fundraiser
- Interview with Canadian author Claudia Cornwall for a new book titled *Catching Cancer*, Perth
- Keynote speaker at the 1st Perth Air Quality Forum, Perth
- Keynote speaker at the 1st Civil Engineering Conference, Kuala Lumpur, Malaysia
- Collaboration meetings with University of Malay Marshall Centre team

**April**
- Conferred Honorary Professor, South East University, Nanjing China
- Meeting with Russian Federation Minister for Health Veronika Skvortsov and media conference, Moscow Russia
- Lecture, attend FameLab, TED talks, and panelist on BBC Radio 4 program *The Infinite Monkey Cage*, Cheltenham Science Festival, UK

**May**
- Conferred Honorary Professor, South East University, Nanjing China
- Meeting with Russian Federation Minister for Health Veronika Skvortsov and media conference, Moscow Russia
- Lecture, attend FameLab, TED talks, and panelist on BBC Radio 4 program *The Infinite Monkey Cage*, Cheltenham Science Festival, UK

**June**
- Collaboration meetings with University of Malay Marshall Centre team

**July**
- Digestive Diseases Week, San Diego USA
- Opening of the Warren Clinical Skills Lab, University of Adelaide
- Lecture at St Petersburg Medical Academy, St Petersburg, Russia
- Conferred Honorary Professor at Shantou University, China
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- Lecture to Yr 12 students Rossmoyne Senior High School, Perth
- Keynote, Grower Group Alliance, Perth
- Lecture at the 7th Chinese Digestive Diseases Forum, Beijing China
- Intensive Mandarin course at Peking University, Beijing China
- Lecture at Science for our Future Festival, Jakarta Indonesia
- Public lecture Genetic Diversity: from human to Hp, Eijkman Institute, Jakarta Indonesia
- Lecture at Science for our Future Festival, Universitas Airlangga, Surabaya Indonesia
- Lecture at Men’s Health Conference, Melbourne
- Filming for video presentation for opening ceremony address to 1st International Conference on Infectious Diseases & Nanomedicine, Nepal
- Plenary lecture at the FOSCA (Federation of Chinese Scholars in Australasia) symposium, Perth
- Meeting with Chris von Deutschburg’s Counsel re affidavit, Perth
- Meeting with Director of Busselton Health Study, Perth
- Invited speaker at ANZCCART conference re animals in research: Thinking outside the cage: a different point of view, Perth
- Keynote Curtin Health Innovation research Institute, Perth
- Launch of Perth US Asia Centre by US Secretary of State Hillary Clinton, Perth
- Meeting with economic mission headed by HRH Prince Phillippe of Belgium, Perth
A DECADE OF DELIVERY: 2013

There was now broad public awareness, acceptance and understanding that *H. pylori* caused peptic ulcer and Marshall and Warren’s *Helicobacter* story had become embedded in school classrooms and other forms of popular culture.

Ondek, the WA biotech company founded by Marshall, featured in a highly-rated episode of the ABC television science program *Catalyst* and was nominated as a market front-runner for its oral vaccines, allergy treatments and other new clinical products being developed in its Perth laboratory.

Western Australian Premier Colin Barnett launched a think tank to address the role of science in the State’s economic and social future, helping shape the inaugural *Science Statement for Western Australia*, in 2015.

Chris von Deutschburg’s murder conviction was over-turned.

In 2013, the Ambassadors completed 402 engagements. They visited 30 cities in 16 countries and travelled an estimated 216,948 kilometres.
Total invitations: 702
Completed activities: 402
Patients cured: 146
Savings to WA public health: $2,465,356

Public Health Leadership activities: 214
Scientific Leadership activities: 211
Educational Leadership activities: 116
Community Leadership activities: 130

Australia, Hungary, Spain, Sweden, Taiwan
Australia, Mexico, China
Australia, China, Portugal, Hong Kong
Australia

• Warren attends the Centre for Research and Innovation in Biomedical Sciences, University of Nuevo Leon, Mexico
• Interview highlighting 25 years of Scitech, Perth
• Invited speaker at the Catholic Education Office Heads of Department area network, Perth
• Speech to 4th Australian Chinese Biomedical Research Conference, Hangzhou China
• Signing of MOU with Sun Yat-sen University, Guangzhou China
• Warren presents at University of Lisbon, Portugal
• Debate What is the future of medicine: Clinician versus Dr Google, Perth
• Meeting with student recipient of the Daejeon Scholarship, Perth
• Two academic papers published

• Interview for a TV series “Life on US” for SBS, Perth
• Guest speaker at the centenary of the Marist Brothers education in WA, Perth
• Inspirational talk to students in the UWA-China Research Training Program, Perth
• Speech to Australia & New Zealand Laboratory Animal Association, Perth
• Interview for TV documentary Mysterious Human Body-Stomach broadcast in Mandarin and English via 9 satellites worldwide
• Filming for promotional video for Group of 8 Universities, Perth
• Photoshoot for UWA New Century Campaign, Perth
• Smart Science Initiative, workshops for science teachers, Perth
• Warren visits Rostrata Primary School, to celebrate student book, Perth
• Australian Academy of Science think tank on declining scientific literacy, Canberra
• Filming for ABC Catalyst on treating allergies using a safe Hp product, Perth
A DECADE OF DELIVERY: 2014

As Patron of the UWA Confucius Centre Marshall gave a five minute speech in Mandarin to a Chinese audience of approximately 2000 at the Annual Global Confucius Centres Conference in Xiamen.

The speech *My Mandarin Journey* was highly acclaimed by Chinese media and UWA was named the world’s top Confucius Centre for 2014. The presentation heightened interest in the establishment of Marshall Centre-UWA franchises across China.

Marshall now holds honorary professorships at five Chinese universities and the scientific and clinical collaborations he has established, in a country of 700 million potential *H. pylori* sufferers, are seen as viable operating models for similar centres internationally.

*Health is more important than medicine* was the theme of Marshall’s keynote speech at the official opening ceremony of the World Health Summit, in Berlin, Germany.

In 2014, the Ambassadors completed 485 activities. They visited 23 cities in 12 countries and travelled an estimated 284,040 kilometres.

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<td>• Marshall and Warren feature in a 30 part series of the world’s greatest scientists for a documentary called <em>Prometheus’ Fire</em> with the aim of improving the understanding of modern science among Chinese public</td>
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<td>• Warren lectures at the Universidad Francisco de Vitoria in Madrid, Spain</td>
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<td>• Keynote address at the Rural Health West Annual Conference in Perth</td>
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<td>• Marshall is guest speaker at Scotch College Awards breakfast for Top Students, Perth</td>
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<td>• Attend the launch of the 2014 WA Innovator of the Year awards</td>
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<td>• Interview about the impact global online media is having on shaping health information</td>
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<td>• Meeting with Shenzhen Municipal government senior officials and the Shenzhen Science, Technology &amp; Innovation Committee, Shenzhen China</td>
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<td>• Digestive Diseases Week conference in Chicago USA</td>
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<td>• Keynote speaker at the ARVO conference in Orlando USA</td>
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<td>• Guest speaker at the annual Health Sector Assembly in Tokyo Japan</td>
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<td>• Opening address at the Dorevitch Mens Health conference, Melbourne</td>
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<td>• Warren presents at the Chinese Academy of Medical Sciences, Beijing China</td>
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<tr>
<td>• Marshall presents at WA Inventors Association, Perth</td>
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<tr>
<td>• Meeting with research team ECU Electron Science Research Institute, Perth</td>
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<td>• Australian Day presentation at the Nobel Laureates Forum, Lindau Germany</td>
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</table>
Total invitations: 774
Completed activities: 485
Patients cured: 146
Savings to WA public health: 2,526,384

Public Health Leadership activities: 273
Scientific Leadership activities: 301
Educational Leadership activities: 149
Community Leadership activities: 137

- Association for Tertiary Education Management meeting, Perth
- Lecture at the Gravity Discovery Centre, Gingin WA
- Presentation of Convocation Awards, UWA, Perth
- Warren presents at Australian National University, Canberra
- Documentary interview with Russian TV Channel One
- Meeting with students from Ngee Ann Polytechnic, Singapore, in Perth
- Interview with the producer of The Incomplete Map of the Cosmic Genome an online science app run by the BBC
- Opening of St Hilda’s Girls School Science Building, Perth
- Address to the World Health Summit, Berlin Germany
- Delivers opening address at the 9th Global Confucius Institute Conference in Mandarin, Xiamen, China
- Interview for UWA Historical Society Oral History program
- Meeting, as Patron, with the FHMRF (Fremantle Hospital Medical Research Foundation)
- Invited speaker at the 15th Protein Expression Workshop at CSIRO, Melbourne
- Tetsumon lecture, Nobel Prize Dialogue Symposium, Tokyo Japan
- Papal Audience with European Helicobacter Study Group, Italy
- Conferred Honorary Degree in Medicine and Surgery, Universita Cattolica del Sacro Cuore, Rome Italy
- Marshall appointed co-patron of Ear Science Institute of Australia
- Meeting with WA Governor HE Kerry Sanderson re science policy, Perth
- WA Innovator of the Year Awards, Perth
- WA Health Excellence Awards, Perth
- Technology and Industry Advisory Council meeting with WA Commerce Minister Michael Mischin, Perth
A DECADE OF DELIVERY: 2015

A decade after receiving his Nobel Prize, Marshall was named the world’s most popular living Nobel Laureate, based on research by the Nobel Foundation, and UWA renamed its science library the Barry J. Marshall Library.

The Chinese Government presented him with a prestigious Friendship Award. Established in the 1950s, and restored in 1991, the Friendship Award recognises outstanding foreign experts for their contribution to China’s social development.

During the year, agreements were signed with universities in Chengdu, Nanjing, Shenzhen, Guizhou, Zhengzhou and Xi’an formalising a network of franchises across China for the UWA Marshall Centre for Excellence.

The new Zhengzhou Treatment Centre is located in the world’s largest hospital (7000 beds) with plans to treat about 30 million people. The West China-Marshall Research Centre for Infectious Diseases in Huaxi Hospital, Chengdu is working to develop new drug treatments and is screening Tibetans for a study of human migration.

In 2015, the Ambassadors completed 393 activities. They visited 29 cities in 7 countries and travelled an estimated 283,159 kilometres.

- Meeting with Minister for Foreign Affairs & Member for Curtin Hon. Julie Bishop, Perth
- Teleconference with incoming CEO of NHMRC
- Lecture to medical students re antibiotic resistance, Perth

- Attend the launch of WA’s new science policy by Premier Colin Barnett, Perth
- Science of the Swan conference, Perth
- Interview for new program for physicians “Emergency Medicine” to be broadcast worldwide

- Marshall signs MOU for Huaxi-Marshall Centre, West China Hospital, Chengdu China
- Sichuan University International Communication Forum, Chengdu China
- Academic Symposium, Sichuan University, Chengdu China
- Opening of the Sino–Australia Joint Translational Medical Institute, Shenzhen China

- Warren guest speaker at the Royal Hobart Hospital Pathology Annual Symposium, Hobart
- Guest speaker at the RACS Forum for Junior Surgeons, Perth
- Guest speaker at the 2015 Nobel Prize Laureate Summit, Beijing
- Guest speaker at the Academician Medical Forum, Beijing

- TIAC meeting at the Department of Fisheries, Perth
- Meeting of the Neurotrauma Research Program Board, Perth
- State reception for the King and Queen of Norway visiting Perth
- Delegation of government officials from Wuxi, China
- Marshall attends the National Health Forum in Melbourne

- Attend the launch of WA’s new science policy by Premier Colin Barnett, Perth
- Science of the Swan conference, Perth
- Interview for new program for physicians “Emergency Medicine” to be broadcast worldwide

- Marshall signs MOU for Huaxi-Marshall Centre, West China Hospital, Chengdu China
- Sichuan University International Communication Forum, Chengdu China
- Academic Symposium, Sichuan University, Chengdu China
- Opening of the Sino–Australia Joint Translational Medical Institute, Shenzhen China

- Warren guest speaker at the Royal Hobart Hospital Pathology Annual Symposium, Hobart
- Guest speaker at the RACS Forum for Junior Surgeons, Perth
- Guest speaker at the 2015 Nobel Prize Laureate Summit, Beijing
- Guest speaker at the Academician Medical Forum, Beijing
- Present post graduate research and travel awards at UWA Convocation, Perth
- Attend Ian Constable lecture given by Australian Nobel Laureate Professor Elizabeth Blackburn, Perth
- Guest speaker at the Chinese Hp Infection & Digestive Diseases Forum, Beijing China
- Lecture at Henan Medical University, Zhengzhou China
- Celebratory dinner for the 10th anniversary of the announcement of the 2005 Nobel Prize to Marshall and Warren, Perth
- Presentation of China’s Friendship Award to Marshall, Perth
- Guest speaker at the Australasian Cytometry Society annual meeting, Perth
- Attend Knowledge Nation presentation by Prime Minister Hon. Malcolm Turnbull
- Launch of the WA Branch of the Academy of Health & Medical Sciences
- Visit to Guizhou Medical University Clinic research centre, Guiyang China
- Guest speaker at the 2015 BioEconomy conference, Tianjin China

Australia, Macau, China

Australia, USA, UAE

Australia, China

Australia
A DECADE OF DELIVERY: 2016

The Office of the Nobel Laureates closed on 30 June 2016 after 10 years of funding from the Western Australian Government. Marshall’s role as WA Ambassador for Life Sciences continues and will be supported for two years by the WA Office of Science.

Dr Warren no longer receives administrative support. Kris Laurie, the Nobel Laureates’ Manager since October 2005, and Susie Maluish, Warren’s personal assistant and ONL archivist since 2011, retired on 31 August 2016. Jeanette Harrison, the office accountant since 2012, moved to other projects.

In the future, Marshall’s ambassadorial activities will be coordinated by the Marshall Centre for Infectious Diseases and Training which also supports his ongoing research and collaborations.

This report summarises a decade of delivery from the Nobel Laureates as WA Ambassadors for Life Sciences and of ONL in supporting the Laureates’ work for WA and the worldwide community.

From January to 30 June the Laureates completed 178 engagements. They visited 7 countries and travelled an estimated 129,689 kilometres.

• Meeting with Susan Byrne and Prof. Cindy Bulik about intestinal microbiota in anorexia nervosa and obesity, Perth
• Lecture at the University of Indonesia Medical School, Jakarta Indonesia
• Marshall lecture Humans, Stomach Ulcers and Bacteria: How a simple discovery grows into many new scientific advances, Japan
• Reviewer for first Innovation competition of International Talents, Shenzhen, China
• Meeting with SAFEA Administrator Zhang Jianguo and Mayor Xu Qin, City of Shenzhen, China
• Marshall conferred Honorary Professor at 120th anniversary celebration of Xi’an University
• WA Health Translational Network and Neurotrauma Research Program meetings, Perth
• Meeting with Nanjing Government, China
• Meeting with Director of Gastroenterology, Changhai Hospital, 2nd Military Medical University, China
• Dinner to celebrate 50th anniversary of Busselton Health Study, WA
• Keynote address at Australian Doctors for Africa Conference, Madagascar, Africa
• Meeting with President and Health Minister, Madagascar

Australia, Japan, China, Indonesia
Australia, China
Australia, China
Australia, China
Australia, Madagascar, Singapore
Australia, Armenia, Austria
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As well as writing his Nobel Banquet speech and editing many of his research papers, Adrienne helped create the initial Perth Office of the Nobel Laureates, balanced Barry’s international travel with important family activities and accompanied Barry to international Nobel events. Adrienne has given several lectures about the Nobel Prizes. She has an Honours degree in Psychology (UWA 1981), a Diploma of Education (ECU 1983) and Honours in Fine Arts (Curtin U. 2003). Nowadays you might see Adrienne guiding visitors at the Western Australian Art Gallery in Perth.
Marshall and Warren’s discovery that a bacterium, *Helicobacter pylori*, causes ulcers, is a causative factor in stomach cancer and can be cured with antibiotics, is one of the most significant medical breakthroughs of the 20th Century.

Like many pioneering stories, what appeared to be overnight success was decades in the making. Along the way, the scientists had been ridiculed and shunned as charlatans and feted like rock stars. Theirs is a story of chance as well as huge personal risk, of grit and determination, curiosity and self-belief and having the courage to swim against a tidal wave of commercial pressure and expert opinion.

Not only has Marshall and Warren’s ground-breaking work saved thousands of lives, it forced a momentous shift in scientific thinking. Medical text books have been re-written and a wave of exciting new ideas and opportunities have emerged in the wake. Thirty years after their seminal paper was published in the Lancet in 1984 it is still in the top one per cent of all cited papers.

Any suggestion that the tiny spiral-shaped *Helicobacter pylori* (*H. pylori*) bug was a deadly threat to health was instantly dismissed. For over a century the scientific world knew the bug existed but it was ignored because of an unshakeable belief that bacteria could not survive in the stomach’s acidic environment.

In the absence of a better explanation, doctors believed that ulcers were caused by acid and stress and linked to a patient’s personality, lifestyle and genetics. It was an embarrassing ailment and patients were often subjected to years of pain and discomfort involving radical surgery, stomach removal, or prescription drugs for life. Many died from bleeding ulcers and septicaemia or went on to develop gastric cancer. Annual sales of symptom-relieving medications ran into billions of dollars. This meant that pharmaceutical companies had no incentive to find a permanent cure.

Like challenging flat earth beliefs, Marshall and Warren’s evidence to the contrary shook the medical establishment to its core and opposition was heated.

“Ultimately, society must recognize that science is not a democracy in which the side with the most votes or the loudest voices gets to decide what is right.”

*Dr Gregory A. Poland and Dr Robert M. Jacobson*
*New England Journal of Medicine, 2011*
Science by serendipity

Chance had a surprising role to play in Marshall and Warren’s historic breakthrough. Robin Warren was a pathologist at Royal Perth Hospital in Western Australia when a young registrar, Barry Marshall, walked through his door in search of a clinical research project.

For 10 years, Robin had studied gastric biopsies and his work was at the forefront of new explorative technologies, like the flexible endoscope and high-powered electron-microscope. In 1979, on his 42nd birthday, he observed what appeared to be bacteria growing on tissue samples from a chronic gastritis sufferer. Colleagues were sceptical and for the next two years he collected numerous examples to repeat his findings.

Accessing tissue samples from healthy patients was a challenge so the laboratory scientist teamed up with the young clinician in 1981. A year later, the pair completed a study of 100 patients, including 13 with duodenal ulcer. By accident the cultures that were usually discarded after two days were kept over the Easter long weekend. By day five, all 13 of them were found to be infected with *Helicobacter pylori*.

They had been using the correct methods but the cultures were being discarded too early, after just 48 hours. Now a bacterial cause for ulcers seemed likely.

Establishment backlash

The medical establishment laughed at Marshall and Warren’s findings. In professional circles and the media Marshall and Warren were alternately derided and ignored. Publishers and funding bodies refused to support them and Marshall resorted to building his own computer so he could word process the research paper and capture test results from hundreds of ulcer patients.

The prestigious Lancet journal was unable to find reviewers to vouch for their work until UK microbiologist Martin Skirrow successfully repeated their study, followed by other groups who had intentionally set out to prove them wrong. Marshall and Warren’s historic letters were finally published and followed, in 1984, by their definitive paper linking *Helicobacter pylori* infection to duodenal ulcer.
Marshall was convinced that if \textit{H. pylori} was eliminated with antibiotics it would be possible to cure ulcers. Animal tests failed and his personal ethical standards prevented him from testing his hypothesis on other humans.

Undeterred, and much to the dismay of his family, the intrepid investigator drank \textit{H. pylori} and the \textit{US Star} newspaper dubbed him "The Guinea Pig Doctor". Within days he developed halitosis and became violently ill. By day eight, an endoscopy and biopsy conclusively proved that \textit{H. pylori} could infect a healthy person and cause acute gastritis. After a course of antibiotics, he regained his health within weeks.

By 1985, Marshall’s cure rate was outstanding and word was getting out largely through popular media coverage in the USA and Australia. Many patients were coming to him on the quiet, keen to keep their ulcers a secret. The Medical Journal of Australia published an article in 1985 but it would be another 10 years before antibiotic treatment was accepted by mainstream gastroenterology.

In 1994, more than a decade after their initial investigations, Marshall and Warren’s work was finally endorsed by the medical establishment, as the cause of peptic ulcer disease at a consensus meeting of the National Institute of Health. The World Health Organisation declared \textit{H. pylori} a group one carcinogen.

The tide of expert opinion turned and Marshall and Warren’s breakthrough has since been acknowledged as the most important discovery in the history of gastroenterology. Its importance has been compared to the polio vaccine and eradication of smallpox.

\textbf{In the mainstream}

Warren retired in 1999 after the pair successfully completed a seven-year study demonstrating that peptic ulcers rarely returned after \textit{H. pylori} had been eradicated.

Marshall went on to refine their antibiotic treatment and to develop non-invasive breath and blood tests that have slashed the cost of diagnosis and made treatment readily accessible to patients through their general practitioner. The breath test is now manufactured and distributed around the world by pharmaceutical giant Kimberly-Clark.

In 2005, Marshall and Warren were awarded the Nobel Prize. In 2006, with Professor Geoff Shellam, Marshall attracted a A$4 million grant from the Australian Federal Government allocated towards the establishment of the Marshall Centre for Infectious Diseases Research and Training which opened in 2007. Today, the Marshall Centre provides expert leadership in the diagnosis and treatment of antibiotic resistant \textit{H. pylori} and related disease.

\textbf{Helicobacter Pioneers}

Barry Marshall’s book \textit{Helicobacter Pioneers: First hand accounts from the Scientists who Discovered Helicobacters 1892 - 1982} provides a unique insight into the road to \textit{Helicobacter} discovery. It introduces the pioneering researchers who observed the bug and provided a century of clues which led Marshall and Warren to their Nobel Prize-winning work.

\textit{Helicobacter Pioneers} has been translated into several languages, even Chinese, and remains in print.
THE LAUREATES:
BARRY J. MARSHALL

Barry James Marshall AC, FRACP, FRS, FAA, DSc (born 30 September 1951)

The following excerpts were taken from Les Prix Nobel. The Nobel Prizes 2005, Editor Karl Grandin, Nobel Foundation, Stockholm, 2006. The essays were written at the time of the award and later published in the book series Les Prix Nobel/Nobel Lectures/The Nobel Prizes.

I was born in 1951 in Kalgoorlie, a prosperous mining town east of Perth, Western Australia. At the time I was born my father was 19 years old and in the final year of his apprenticeship as a fitter and turner. My mother quit her nursing training to have me at the age of eighteen years (but returned to complete her career when I entered medical school).

We moved quite a bit through my early childhood. My first memories are of life in Carnarvon. Our house was on Babbage Island about 100 yards from the beach. We had electricity, an outhouse toilet, dirt floors in parts of the house, a telephone, refrigerator, a car, a cat and a dog. I suspect I was born with a boundless curiosity and this was encouraged through my childhood.

Being the eldest of four children, I was expected to be the responsible one and often found myself controlling two younger brothers who shared my exuberant and inquisitive nature. In our dad’s shed, my brothers and I had access to all the tools needed to build or dismantle anything. I frequently got into trouble doing both. As the years went by, and I grew up, I recall building a slingshot, a crystal set, a Morse-code set, various guns, a hydrogen generator for balloons, electric devices and fireworks.

After high school, at Newman College, I felt that my mathematical ability was not strong enough to do electrical engineering, so I chose medical school.

I graduated from the University of Western Australia MBBS (Bachelor of Medicine, Bachelor of Surgery) in 1975 and thereafter performed internships and residencies in internal medicine at the Queen Elizabeth II Medical Centre (Sir Charles Gairdner Hospital).
My wife Adrienne and I must have been very busy during those years. We had four children, Adrienne was finishing the honours year of her psychology degree. My non-medical time was spent delivering children to various child-minding facilities, renovating our house and indulging in my hobby of computers and electronics.

In the evenings during 1981 I continued with my hobby of computing and electronics so that, by the end of that year, I had completed the construction of a home computer capable of word processing.

In the second half of 1981 my rotation took me to the gastroenterology division of Royal Perth Hospital. It was there that I met Robin Warren. As part of my training I was encouraged to perform a clinical research project each year. I was especially interested because one of the people on Robin’s list was a woman I had seen in my ward. She had severe stomach pain but no diagnosis. In desperation we had referred her to a psychiatrist and commenced antidepressant medication for want of a better treatment.

The family moved to Port Hedland in July 1982. In October 1982, I presented the preliminary findings from our study to the local College of Physicians meeting, where it received a mixed response. I found that my contract at Royal Perth would not be renewed the following year.

Fortune stepped in when I was approached by Drs Norm Marinovich and Ian Hislop at Fremantle Hospital who suggested they would find me a senior registrar position and fund me to continue. It was at Fremantle in those two years that the first effective treatments were devised. I did my famous self-experimentation and the early urease tests were developed.

In September 1983, I visited Martin Skirrow at the Worcester Infirmary. Martin’s registrar, Cliodna McNulty, was able to successfully isolate the organism, showing that the spiral bug was not merely an Australian phenomenon but was present in ulcer patients in the UK as well.

In 1984, there were several groups around the world obtaining results which paralleled those of our group in Perth. We became a closely knit group.

But 1984 was a difficult year. I was unsuccessfully attempting to infect an animal model. Most of my work was rejected for publication. When the work was presented, my results were disputed and disbelieved, not on the basis of science but because they simply could not be true.

At the same time I was successfully experimentally treating patients who had suffered with life threatening ulcer disease for years. Some of my patients had postponed surgery which became unnecessary after a simple 2 week course of antibiotics and bismuth.

Becoming increasingly frustrated with the negative response to my work I realized I had to have an animal model and decided to use myself. I was taken by surprise by the severity of the infection (but) I had a successful infection. I had proved my point. At the end of 1984 I was funded by the Australian Medical Research Council to conduct a prospective double blind trial to see if antibiotics could cure duodenal ulcers.

Even though I was not officially collaborating with Robin when I was working at Fremantle Hospital in 1983–84, we still met to discuss the papers we were writing. Early one morning he had a call from a journalist in the US. When asked the usual question about “How do you know it’s a pathogen and not a harmless commensal?” Rob blabbed the results of my still unreleased work with “I know because Barry Marshall has just infected himself and damn near died”, a slight exaggeration, but it made for good copy. The next day the story appeared, “Guinea-pig doctor discovers new cure for ulcers... and the cause”.

This became one of the serendipitous, life changing events in my life. Firstly, I was
contacted by a continuous line of patients in the US who read the story and were desperate for treatment. I was able to help. I was treating patients by proxy in the US as early as 1984. Ten years later this became important in a dispute with another doctor who claimed to be the first.

The second result was that it was read by Mike Manhart, a microbiologist working for Proctor and Gamble in the US. P & G later patented much of my work and funded a fellowship for me in the US. The ten years spent at University of Virginia, were a chance to extend my research, particularly in the area of treatment and diagnostics.

I also met Bill and Sandy Fry in 1987. Bill owned a company Tri-Med and bankrolled a US study for my CLOtest diagnostic and launched it in the US. Later he was to also pick up the $14-Urea Breath Test and shepherded it through the FDA at a cost of several million dollars.

Patients often wanted to make a donation to the work so I set up a foundation to use the money for patient and doctor education. On one occasion there had been a story about the cure in the Sunday papers across the US. In the following weeks we received 30,000 letters all with donations of a dollar or two to pay for postage and photocopying of information. We had to hire in students to handle it all.

The tide of acceptance began to turn in the early 1990s. In February 1994 the NIH held a consensus meeting in Washington DC which ended with the statement to the effect that the key to treatment of duodenal and gastric ulcer was detection and eradication of *H. pylori*. I had been waiting for ten years for this day.

At the end of 1994, I took a year of leave from the university. We moved back to Perth in 1996. I was awarded the McFarlane Burnet Fellowship which funded my lab at the University of WA for a 5 year period. In 1998, Tri-Med US bought the manufacturing rights to CLOtest. I was keen to keep control of the products in Western Australia so I started TRI-MED in Perth.

Before finishing I want to acknowledge all those scientists who failed to recognize *H. pylori*. Without them I would have had a very different career.

One of the truly great things about winning the Nobel Prize in 2005 was that I was living and working back home. I got to share it and celebrate with those who had been involved in the initial work at Royal Perth and Fremantle Hospital.

There were many occasions when luck played a role in my life. I look back and am grateful to the many friends and family who helped me along the way, most importantly, my wife Adrienne, and my children, their partners and my grandchildren.”

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Current Appointments and Positions

• Nobel Laureate and Western Australian (WA) Ambassador for Life Sciences

• Senior Principal Research Fellow, Faculty of Medicine, Dentistry and Health Sciences, School of Pathology and Laboratory Medicine, University of Western Australia (UWA), Perth WA

• Director Marshall Centre for Infectious Diseases Research and Training, Helicobacter Research Laboratory, UWA, Perth WA

• Honorary Clinical Professor, Medicine and Pharmacology, Sir Charles Gairdner Hospital, Perth WA

• Consultant Gastroenterologist, Sir Charles Gairdner Hospital, Perth WA

• Founder and Director of ONDEK, a biotechnology company, Perth WA

• Founder of TRI-MED Distributors, a diagnostics company, Perth WA

• Ambassador, Perth Convention Bureau, Perth WA

• Clinical Research representative, Neurotrauma Research Program Executive Committee, Perth WA

• Co-patron, Ear Science Institute of Australia, Perth WA

• Director, Charlies Foundation for Research, Sir Charles Gairdner Hospital, Perth WA

• Medical Patron, Harry Perkins Institute of Medical Research, Perth WA

• Member of the Science Centre World Summit 2017 Honour Committee, Japan

• Member of TIAC, Western Australian Technology and Industry Advisory Council, Perth WA

• Member, Australian Inventors Association, Perth WA

• Member, University of Malaya High Impact Research Advisory Council, Malaysia

• Member, UWA In the Zone Editorial Committee, Perth WA

• Panel member, Australian Medical Association (WA) Doctors in Training research portal committee, Perth WA

• Patron and Scientific Advisor, Australian Doctors for Africa, Perth WA

• Patron, Fremantle Hospital Medical Research Foundation, Perth WA

• Patron, International Outreach Advisory Committee, ISTIH, Perth WA

• Patron, Scitech, Perth WA

• Patron, UWA Science Futures Foundation, Perth WA

• President, Helicobacter Foundation, www.helico.com
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<th>Year</th>
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<td>2016</td>
<td>Chinese Government’s 1000 Talents Plan</td>
<td>China</td>
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<td>2015</td>
<td>China Friendship Award, China’s highest honour to foreign experts</td>
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<td>2015</td>
<td>Fellow of the Australian Academy of Health and Medical Sciences</td>
<td>Australia</td>
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<td>2014</td>
<td>Doctor <em>honoris causa</em>, Universita Cattolica del Sacro Cuore</td>
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<td>2013</td>
<td>Honorary Doctorate, University of Newcastle</td>
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<td>Honorary Professor, Chinese University of Hong Kong</td>
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<td>2012</td>
<td>Doctor <em>honoris causa</em>, Wroclaw Medical University</td>
<td>Poland</td>
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<tr>
<td>2012</td>
<td>Honorary degree of Doctor of Medicine</td>
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<tr>
<td>2011</td>
<td>Australian Society of Medical Research Medalist</td>
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<tr>
<td>2011</td>
<td>University of Malaya Nobel Fellow</td>
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<td>2011</td>
<td>Foreign Member, Chinese Academy of Engineering</td>
<td>Beijing, China</td>
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<tr>
<td>2010</td>
<td>Honorary Professor, Third Military Medical University</td>
<td>Chongqing, China</td>
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<td>2009-14</td>
<td>NHMRC Sir MacFarlane Burnet Fellowship for Nobel Laureates in Physiology or Medicine</td>
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<td>2009</td>
<td>Galen Medal, Society of Apothecaries</td>
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<tr>
<td>2009</td>
<td>Degree of Doctor of Science, <em>honoris causa</em>, University of Oxford</td>
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<td>Honorary Bragg Member, Royal Institute of Australia</td>
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<td>2008</td>
<td>Honorary Professor Southeast University, Nanjing</td>
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<td>2007</td>
<td>Companion in the General Division of the Order of Australia AC</td>
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<tr>
<td>2007</td>
<td>Western Australian of the Year (shared with Dr J R Warren)</td>
<td>Perth WA</td>
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<td>2006</td>
<td>Western Australian Citizen of the Year (shared with Dr J R Warren)</td>
<td>Perth WA</td>
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<td>The William Beaumont Prize, American Gastroenterological Association</td>
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<td>Doctor <em>honoris causa</em> of Science, Polish Academy of Medicine</td>
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<td>2006</td>
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<td>1998</td>
<td>Dr. A.H. Heineken Prize for Medicine, The Alfred Heineken Fondsen Foundation, The Netherlands</td>
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<td>Kilby Prize, The Kilby Foundation, Dallas USA</td>
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<td>Paul Ehrlich Prize, Paul Ehrlich Institute, Frankfurt, Germany (shared with Dr J R Warren)</td>
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<td>1996</td>
<td>Gairdner Award, Toronto Canada</td>
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<td>1996</td>
<td>American College of Gastroenterology Baker Award Lecture, USA</td>
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<td>John Scott Award, Philadelphia USA</td>
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<td>Albert Lasker Award, Albert &amp; Mary Lasker Foundation, New York USA</td>
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<td>1995</td>
<td>American Gastroenterological Association Distinguished Achievement Award and lecture, San Diego USA</td>
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<td>Australian Medical Association (WA) Medical Research award (shared with Dr J R Warren)</td>
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<td>1995</td>
<td>Warren Alpert Prize, Harvard Medical School, Boston USA (shared with Dr J R Warren)</td>
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<td>1993</td>
<td>Admitted to the American Society for Clinical Investigation</td>
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<tr>
<td>1987</td>
<td>Third prize, Best Paper for 1987 Award, American Journal of Gastroenterology, USA</td>
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<tr>
<td>1983</td>
<td>Inducted into Royal Australian College of Physicians, Australia</td>
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<tr>
<td>1969-74</td>
<td>Commonwealth Tertiary Education Scholarship, WA</td>
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<td>Secondary assistance scholarship, WA</td>
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<td>Honorary Professor, Zhejiang University, China</td>
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<td>Honorary Member of Shanghai Association for Science &amp; Technology, China</td>
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<td>2005</td>
<td>The Nobel Prize for Physiology or Medicine (shared with Dr J R Warren)</td>
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<td>Health &amp; Medicine Winner, The Bulletin Smartest 100, Australia</td>
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<td>Silver Seal, University of Bologna, Italy</td>
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<td>Australian Centenary Medal</td>
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<td>2002</td>
<td>Member, Institute of Medicine of the National Academies, USA</td>
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<td>2002</td>
<td>Keio Medical Science Prize, Keio University, Japan</td>
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<td>Inaugural Premier’s Prize for Achievement in Science, Perth WA</td>
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<td>Joint winner, Prince Mahidol Award in Public Health, Bangkok Thailand</td>
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<td>2001</td>
<td>Australian Centenary Medal, Australian Government</td>
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<td>1999</td>
<td>Fellow, Australian Academy of Science, Canberra Australia</td>
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<td>1999</td>
<td>Fellow, British Royal Society, UK</td>
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<td>1999</td>
<td>Benjamin Franklin Medal for Life Science, The Franklin Institute, Philadelphia USA</td>
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<td>1998</td>
<td>Buchanan Medal, The British Royal Society of Medicine, UK</td>
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<td>1998</td>
<td>Distinguished Research Prize, Australian Gastroenterological Society</td>
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<td>1998</td>
<td>Florey Medal, Canberra Australia</td>
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<td>1998</td>
<td>Commonwealth Tertiary Education Scholarship, WA</td>
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THE LAUREATES: J. ROBIN WARREN

John Robin Warren AC (born 11 June 1937)

“I was born in North Adelaide, South Australia, the first child of middle-class parents. I am a fifth generation South Australian.

The Warrens migrated from Aberdeen in 1840. Their eldest son, my great grandfather John Campbell Warren, was a member of the local government, Captain of the Light Cavalry and patriarch of a family of 16 children. My father, Roger Warren, studied viticulture and became one of Australia’s leading winemakers.

My mother’s ancestors migrated from England to Adelaide with the first settlers in 1836–7. My grandfather, Sydney Verco, belonged to a dynasty of doctors. He died young, leaving my grandmother, Alice, with no income and four children to feed and educate. My mother, Helen, had desperately wanted to be a doctor.

My parents married during the depression. Life was not easy. During and after the war, I attended the local public primary school. As I grew older, I obtained my first bicycle, I watched my father take family photographs with his old Voitlander camera, and I finally persuaded him to buy me a Kodak box camera for my 10th birthday - my lifelong hobby of photography was definitely started.

I was never good at sports although I enjoyed a game of cricket, but I did become more adventurous with my bicycle and camera, touring around the Adelaide Hills and taking landscape photographs. Target shooting, which I learnt in the school cadets, became the primary sporting activity of my adult life.

I matriculated from the school in 1954, gaining a Commonwealth scholarship. One morning, my mother found me unconscious on the back lawn. I was soon diagnosed as suffering grand mal epilepsy. I was unable to obtain a driving licence, a major event for young people at that age. There were apparently numerous comments to my mother at the time. It was only years later that I came to appreciate just how much my mother had gone through to support my independence and personal maturation.

I obtained entry to the medical school of the Adelaide University in 1955. Both before and after starting university, I always read widely, including numerous scientific books and medical history books. Astronomy was a particular interest of mine at the time. I read the Oxford Junior Encyclopaedia, all 12 volumes.

Medicine began in earnest with the preclinical years two and three. Most of our time was spent in the anatomy department dissecting a cadaver or learning bone and joint structure and attachments, then the inner organs and the brain. We also learned physiology, biochemistry, pharmacology, embryology and histology. I illustrated my notes for the latter two subjects with full colour sketches.
In those days, the Royal Adelaide Hospital was the only general teaching hospital in South Australia.

After medical school, life became very busy. A second government hospital opened, and I obtained a position there. All graduating medical students were given Junior Resident positions. These entailed about 100 to 120 hours per week working with very little payment (I received £17/10 per week). I bought a Leica M3 camera, and started to turn my hobby to professional subjects, photographing interesting clinical lesions.

The new hospital also provided a second obstetrics facility for the medical school. Some of the students were young women (and) I found myself very attached to one Winifred Williams. Soon we were engaged and, a year later, married. For me, that was the biggest and best decision of my life.

I remained a little innocent about the big bad world outside. I did not realise how easy it was for us, with automatic positions provided – even if it was almost slave labour. Other students had to find employment for themselves. I learned a valuable lesson at the end of my resident year. I assumed it was good manners to only apply for the second year position that I wanted, Registrar in Psychiatry. I did not get the post and found myself, to my surprise, unemployed. Luckily there were still a few positions available, and the one which appealed to me most was Registrar in Clinical Pathology at the Institute of Medical and Veterinary Science, attached to the Royal Adelaide Hospital.

By the end of that year, Win graduated MB BS, and we had our first baby on the way. I applied for every position advertised at the end of the year. My first choice was Temporary Lecturer in Pathology at the Adelaide University, and I obtained the position. The work there consisted largely of morbid anatomy and histopathology, which completed my overview of pathology and convinced me to go for membership of the (then) new College of Pathologists of Australia.
Melbourne

I was offered the position of Clinical Pathology Registrar at the Royal Melbourne Hospital. After four years in Melbourne I finished my College membership and was a fully-fledged pathologist. Our second son, David, was born in Melbourne. Win somehow managed to fit in her intern year between babies. This was complicated by the unexpected arrival of twin sons, Patrick and Andrew, two years later. We had four sons under three and a half years old!

I was trying to obtain a position as pathologist at Port Moresby in Papua New Guinea. This had to be done through the Department of Foreign Affairs and government red tape was extraordinarily slow. I was working in my room one afternoon, when a thickset man with a strong Germanic accent walked in and said, “You are working with me next year” and walked out. I discovered he was Professor Rolf ten Seldam, the Professor of Pathology at the University of Western Australia and the Royal Perth Hospital. I gave the Department of Foreign Affairs one day to settle the position in Papua and when they failed to reply, I accepted the position in Perth.

Perth

We arrived in Perth in January 1968. In 1970, our last child, Rebecca, was born - our first daughter. Win decided to specialise in psychiatry, and was accepted into the college training scheme which took most of her time into the early 1980s.

Helicobacter

During the 1970s I wrote up a few interesting cases and developed an interest in the new gastric biopsies that were becoming frequent. I also attempted to develop improved bacterial stains for use with histological sections. Then, in 1979, on my 42nd birthday, I noticed bacteria growing on the surface of a gastric biopsy. From then on my spare time was largely centred on the study of these bacteria.

In 1981, I met Barry Marshall, and we agreed to undertake a more complete clinico-pathological study. This resulted in our papers of 1983 and 1984, linking the infection to duodenal ulcer and culturing a new organism.

Before I met Barry, Win was the only person to accept my work and encourage me.
My last major work was the pathology for a large study by Barry Marshall et al. to show the effect of eradicating the bacteria on the relapse rate of duodenal ulcer. The study extended over seven years. It clearly showed that, after successful treatment of the infection, recurrence of peptic ulcer was rare.

By 1990, our findings began to be recognised by the medical community. Yet, in spite of this, no one but patients and local general practitioners appeared to believe our findings. Many patients demanded treatment and some GPs were very keen to treat them. Otherwise, it seemed that only our wives stood beside us.

In 1996 I was invited to Japan for a lecture tour. The following year, a three-month tour of Germany and adjacent countries was arranged. This provided us with some real recognition for our work, and it seemed the fighting was over. Soon after our return, Win experienced difficulty eating, and investigation showed duodenal obstruction due to an inoperable pancreatic carcinoma. Win gradually deteriorated and died four months later. After spending this time caring for her, I decided the time had come to retire.

At first, I spent most of my time trying to return to my hobby, photography. I intended to print my own pictures, using today’s improved digital technology. I had to put this project aside to try and digitise all my old publications, microphotographs and other works, since I was receiving many requests for them. Now I have to put that aside, because the Nobel Prize has brought a stream of requests for my presence at meetings and presentations.”

Robin Warren, 2008
Photo: David Warren
Honours and Awards

2014  Doctor honoris causa, Universidad Francisco De Vitoria, Madrid Spain

2012  Doctor of Medicine honoris causa, University of Sydney, Australia

2012  Honorary Professor, Huaqiao University, China

2012  Honorary Professor, Northwestern Polytechnical University, Xi'an Shaanxi Province, China

2008  Distinguished Pathologist Medal, International Academy of Pathology, Australia

2008  Doctorem Magistralem Artis Medicæ Atqua Chirurgicæ honoris causa, Romana Studiorum Universitas "Ad Turrim Vigatam", Rome Italy

2007  Companion of the Order of Australia (shared with Dr B J Marshall), Perth WA

2007  Western Australian of the Year (shared with Dr B J Marshall), Perth WA

2007  Honorary Doctorate, The University of Toyama, Japan

2007  Honorary Doctor honoris causa, Otto-von-Guericke Universität, Magdeburg Germany

2007  Honorary Member, German Society of Pathology, Magdeburg Germany

2007  Medal of the Hirosaki University School of Medicine, Japan

2007  Special Recognition Award for Distinguished Service to Surgical Pathology, American Society for Clinical Pathology

2007  Premier's Science Awards, Western Australian Science Hall of Fame, Government of Western Australia

2006  Western Australian Citizen of the Year (Dr B J Marshall), Perth WA

2006  Fellowship of the Royal Australian College of Physicians honoris causa, Australia

2006  Doctor of the University of Adelaide honoris causa, Adelaide SA

2006  Gold Medal, Australian Medical Association, Australia

2006  Honorary Member, Polish Society of Gastroenterology socium honoris causa, Societas Gastroenterologiae, Poland

2005  Nobel Laureate in Physiology or Medicine

2005  Medal of the Universitas Studiorum Romana “La Sapienza”, Italy

2000  Australian Institute of Political Science, Cavalcade of Australian Scientists of the 20th Century, Australia

1998  Faulding Florey Medal, Australia

1997  The Paul Ehrlich and Ludwig Darmstaedter Award, Paul Ehrlich Foundation, Johann Wolfgang Goethe-Universität, Frankfurt am Main Germany (shared with Dr B J Marshall)

1997  Guest speaker, Centenary Meeting of the German Society of Pathology, Berlin Germany

1997  Honorary Doctor of Medicine, University of Western Australia

1997  Guest speaker, World Helicobacter meeting, Lisbon Spain

1996  Inaugural Award, First Western Pacific Helicobacter Congress, Guangzhou China

1996  The Medal of the University of Hiroshima, Japan

1996  Distinguished Alumni Award, University of Adelaide Alumni Association, Australia

1995  Australian Medical Association (WA) Medical Research award (shared with Dr B J Marshall)

1995  Distinguished Fellows Award, Royal College of Pathologists of Australasia

1995  Warren Alpert Prize, Harvard Medical School, Boston USA (shared with Dr B J Marshall)

1991  Guest of honour, Sixth International Workshop Campylobacter, Helicobacter and Related Organisms, Australia
ACKNOWLEDGEMENTS

The Nobel Laureates have been supported over the years by the following team members who have worked in the Office of Nobel Laureates and with the Marshall Centre.

Each person’s contribution has had a significant impact and their expertise, dedication and enthusiasm is acknowledged and very much appreciated.

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Aleksandra Debowski  Hong Li  Mohammed Benghezal
Alfred Tay  Hooi Ee  Rachael Bridges
Alma Fulurija  Jacqueline McNally  Rod Blechynden
Antonina Volikova  Jeanette Harrison  Rosalind Stott
Bernie Grogan  Ji (Kevin) Li  Samuel Lundin
Binit Lamichhane  Jim Blanchard  Senta Walton
Charlene Kahler  Joanne Barram  Shelley Blechynden
David Warren  Josephine Muir  Sophie Dwyer
Elina Spina  Kazufumi Kimura  Susie Maluish
Eng Chua  Kris Laurie  Tiffany Fox
Fanny Peters  Marg Glenn  Tim Perkins
Geoffrey Shellam  Mari Warren  Tingting Liao

ONL has received outstanding support from many consultants and advisors. We thank them all for their professionalism and creativity with special mention to Tina Kordys at iTalk Travel (northperth.italk.travel), Frances Andrijich Photographer (andrijich.com.au) and designer Michelle Reid (reidmultimedia.com.au).

As the creator of the 10 year Nobel Laureate social impact study and report I would like to acknowledge and thank Mrs Marie Howarth, the report co-author, my friend and mentor. Marie and I worked on this report for three years, mostly in the rarest of commodities – our spare time.

Thank you Marie for your good humour, sound advice and patience and for loving this project.

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