Australian Government
National Health and Medical Research Council
NHMRC

Curing stomach ulcers

Stomach ulcers have been a significant cause of illness throughout recorded history. Up until recently, they were thought to be caused by excess stomach acid, spicy food or stress. However, NHMRC-funded researchers at the University of New South Wales (UNSW) played key roles in the Nobel Prize winning discovery that these ulcers are ultimately caused by a bacterial infection, and that they can be cured using antibiotics. This research has led to the virtual elimination of peptic ulcer disease throughout the world, where treatment is available.

Origin

In 1964, microbiologist Rene Dubos proposed that within healthy animals there exists an ecosystem composed of the digestive organs and the micro-organisms that live within them.

Dubos's theory was difficult to substantiate because digestive system microbes were difficult to grow in the laboratory. However, when Dubos' Australian postdoctoral student Adrian Lee moved to UNSW, testing this theory became the focus of his laboratory's research.

Investment

Over time, NHMRC-funding supported the following UNSW researchers who were investigating the microbiome: Graeme Cooper, Adrian Lee, Hazel Mitchell, Tom Borody, Stuart Hazell, Jani O'Rourke, Richard Ferrero and Philip Sutton.

Funding from NHMRC and the Royal Perth Hospital (RPH) Research Foundation also supported research at the University of Western Australia/RPH, with a team that included clinician-researchers Barry Marshall and Robin Warren.

Research

In 1982, Marshall contacted the UNSW team seeking their assistance in identifying a particular spiral-shaped bacteria that he and Warren had obtained from the human stomach. They had been able to grow this bacteri in the laboratory using a method that the UNSW team had developed. Marshall and Warren thought these bacteria could be playing a role in causing gastritis and peptic ulcers.

The UNSW team focused their research on the new bacteria (called *Helicobacter pylori* or *H. pylori*) and developed diagnostic tests for it.

Translation

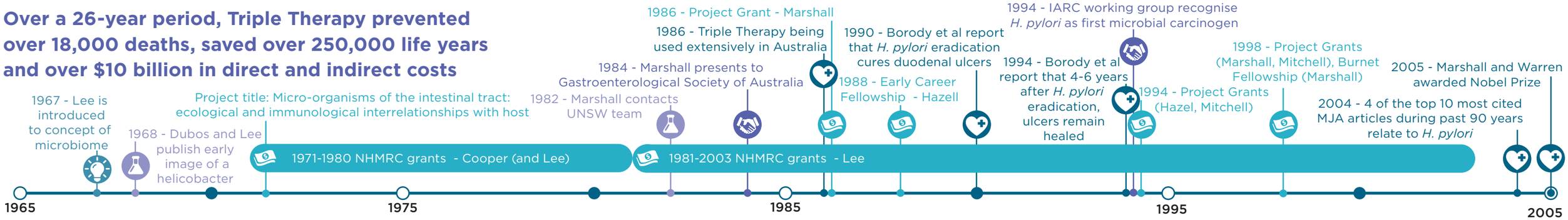
St Vincent's Hospital gastro-enterologist Tom Borody recognised that the only way to prove that *H. pylori* caused ulcers was to eradicate the bacterial infection and then show that the ulcers both healed and stayed healed. In 1989, Borody and colleagues reported that the treatment they developed - called 'Triple Therapy' - led to the eradication of *H. pylori* and the subsequent healing of ulcers.

In 1994, they reported that 4–6 years post-eradication, ulcers remained healed and that the re-infection rate was only about 0.1% per annum.

Impact

The discovery of *H. pylori* and the development of Triple Therapy have brought enormous benefits through reductions in the prevalence of *H. pylori* infection and in associated morbidity, mortality, hospital admissions and health care. In Australia, between 1990 and 2015, treatment of peptic ulcer disease by Triple Therapy is estimated to have prevented 18,665 deaths and saved 258,887 life years and 33,776 productive life years. The total savings, over the 26-year period, including direct and indirect costs, are calculated to be $10.03 billion.

Over a 26-year period, Triple Therapy prevented over 18,000 deaths, saved over 250,000 life years and over $10 billion in direct and indirect costs



Researchers

Prof Adrian Lee AM
Prof Barry Marshall AC
Prof John Warren AC
Prof Geoff Cooper
Prof Tom Borody
Prof Hazel Mitchell
Prof Stuart Hazell
Dr Jani O'Rourke

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