Australians win Nobel for linking bug to ulcers

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Two Australians have won the 2005 Nobel Prize in Physiology or Medicine for establishing that bacteria cause stomach ulcers, it was announced on Monday.

Working at the Royal Perth Hospital, Barry Marshall and Robin Warren established beyond all doubt in the 1980s that Helicobacter pylori causes stomach ulcers by infecting and aggravating the gut lining.

Moreover, they showed that ulcers could be cured altogether by killing the bacteria with antibiotics. Hitherto, ulcers had been considered uncurable. Instead, patients’ symptoms were treated with a lifetime of drugs to reduce the acidity of the gut.

The pair’s claims provoked a fierce backlash from the medical establishment, which held to the dogma that ulcers were brought on by stress and lifestyle, and could not be cured. By revealing a simple cure, the researchers also threatened to destroy huge and lucrative global markets for the existing anti-ulcer drugs, which simply eased symptoms.

Abuse and ridicule

At conferences, the two scientists were subjected to abuse and ridicule. “There was such a prejudice against the idea that bacteria could grow in the acidity of the stomach,” says David Kelly, a senior microbiologist at the University of Sheffield, UK.

The controversy is euphemistically alluded to in the Nobel citation, which credits the pair with “tenacity and a prepared mind [to challenge] prevailing dogmas”.

Warren, a pathologist from Perth, first noticed in 1982 that strange, curved bacteria frequently colonised the lower part of the stomach in biopsies from patients with ulcers, and that the bugs always lived close to sites of inflammation.

Marshall, a young clinical fellow, became interested in Warren’s findings and together they initiated a crucial study of biopsies from 100 patients. From these, Marshall eventually learned how to grow the bacteria in the lab, and named the species Helicobacter pylori.

They established that the organism was almost always present in patients with gastric inflammation, duodenal ulcers or gastric ulcers.
Next, the pair proved that patients could be cured, but only by eradicating the bacteria with antibiotics. Notably, Marshall proved in 1985 that the bacteria caused gastric inflammation by infecting himself, then curing his condition with antibiotics.

**Heroic experiment**

“This extraordinary act demonstrated outstanding dedication and commitment to his research,” says Bob May, president of the UK Royal Society.

Kelly believes that Marshall performed his “heroic experiment” out of sheer frustration at the failure of other doctors to accept his results.

Since their discovery, it has been accepted beyond all dispute that H. pylori causes more than 90% of duodenal ulcers and 80% of gastric ulcers.

Half of all humans carry the bugs in their stomachs for life, but on average only 10 to 15% of those infected develop gastric inflammation or ulcers. In some individuals, infections can lead to stomach cancer.

Although the idea that bacteria cause chronic inflammatory disease was seen as heresy back in the 1980s, there is now increasing evidence that bacteria might be to blame for other conditions, such as Crohn’s disease, rheumatoid arthritis and even the clogging of arteries that leads to coronary heart disease.

Marshall, who has set up his own Helicobacter pylori Research Laboratory in Perth, affiliated with the University of Western Australia, posted a notice on his website saying: “Thank you to everyone. At the moment I am overwhelmed with phone calls and congratulations pouring in from all over the world.”

Helicobacter pylori
— the bacterium causing peptic ulcer disease

Infection
*Helicobacter pylori* infects the lower part of the stomach, antrum.

Inflammation
*Helicobacter pylori* causes inflammation of the gastric mucosa (gastritis). This is often asymptomatic.

Ulcer
Gastric inflammation may lead to duodenal or gastric ulcer. Severe complications include bleeding ulcer and perforated ulcer.

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