

# Fight begins to eradicate fatal parasite; first vaccines delivered following major funding award

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A vaccine developed by University of Melbourne researchers that could eradicate a fatal form of brain disease will be delivered to Peru next week, and could soon be commercially available thanks to multi-million dollar funding.

The parasite *Taenia solium* causes 50 million tapeworm infections and 50,000 deaths from brain disease in the developing world each year. A major cash injection from the British Government and the Bill and Melinda Gates Foundation means that the vaccine will be registered and be produced on a commercial scale.

Although tapeworms can grow up to metres long and live in humans for years without health implications, their eggs can travel to the brain and cause paralysis and the often fatal condition of neurocysticercosis.

The disease results in cysts on the brain and spinal column, which is the most common cause of acquired epilepsy in the developing world and more than half the world's population living in countries where the parasite is endemic.

Professor Marshall Lightowlers at the Faculty of Veterinary Science has been striving towards the parasite's eradication for almost 30 years.

"I'm in a very lucky position that a lot of people dream and talk about,

but virtually nobody reaches," said Professor Lightowlers.

"This disease has been identified as one that could be eradicated from the globe, so this is a very significant hurdle which means the end is well and truly in sight."

Five field trials were carried out in Peru, Cameroon, Mexico and Honduras between 2006 and 2008. All five trials achieved greater than 99% success.

The field trials have proved so successful that the team has been asked to provide 210,000 doses of the vaccine for a separate US\$15.7m project funded by the Gates Foundation in Northern Peru, with the first of these doses arriving next week.

They will be used to treat 100,000 pigs in an area where the same number of humans are at risk of contracting the disease in the largest field trial of the vaccine to date.

Professor Lightowlers and his colleagues will travel to the infected regions where they have already trained local people to carry out the vaccinations; some from countries including Peru and Cameroon are now completing doctorates at the University.

University of Melbourne researchers have chosen to immunize pigs instead of humans with two intermuscular injections for piglets that prevent the animals from ever becoming infected but does not remove the disease from animals already infected.

"If we can prove that we can produce the vaccine commercially in a way that works in the field we will be looking at philanthropic groups for whom \$100 million or \$200 million isn't a lot of money to pay for the millions of doses needed to vaccinate pigs across the globe," he said.

In countries without proper sanitation, and where pigs and humans live in close quarters, there is a constant cycle of re-infection.

Pigs contract the tapeworm parasite from contact with human faeces, it is then passed on to humans who eat improperly cooked pig meat, and then more seriously, from human to human via exposure to tapeworm eggs in human faeces.

The vaccine will be developed and registered for commercial use by UK-based GALVmed, an organisation dedicated to the development of diagnostics, vaccines and medicines to tackle livestock diseases across the world.

GALVmed has secured US\$28m from the UK Government's Department for International Development and the Gates Foundation for the development of vaccines, of which approximately US\$5m is for the *Taenia solium* vaccine.

Professor Lightowlers says the vaccination could ultimately be delivered directly in humans, but developing it to that point would be a vastly more expensive process and one that would become irrelevant if the disease can be eradicated in pigs.

Source: University of Melbourne

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