

Good news for sheep farmers in footrot fight

Tim Cronshaw

Australian scientists have made an initial breakthrough that could bring sheep farmers closer to eliminating the costly footrot disease.

A team at Monash University in Victoria believe they have identified surface proteins of the footrot bacterium which are more likely to bring about an immune response. It is a key step in developing a new vaccine against the disease, in a joint effort with Maryland scientists in the United States.

The Australian research project leader, Professor Julian Rood, said the extent of the breakthrough would be revealed if they were able to develop a vaccine in the next stage.

Scientists hoped the approach they were taking would find the "chink in the armour" to develop a vaccine that would ultimately eliminate, or dramatically reduce, the incidence of footrot, he said.

"It has given us excellent new options to develop a vaccine and it throws the conventional way of thinking about vaccines on its head. This is the first time it has been

applied to an animal disease," Rood said.

The traditional route of coming up with a vaccine is by working out the major components in the disease process and letting the components predict their ability to raise antibodies and protect against disease.

However, the Monash team took the opposite angle, in an approach called reverse vaccinology. They determined the complete DNA sequence of the pathogenic bacterium that causes footrot, and analysed which of the 1300 proteins are potentially exposed on its surface and more likely to bring about footrot immunity.

Of the 99 "surface" proteins, eight were identified in the footrot bacterium as potential antigens for a new cross-protective vaccine.

Rood said if antibodies could be made that reacted with these proteins, then, it was hoped, vaccines could be manufactured.

"The difference in this approach is we do not have to know about their role in the process to test them, so we have this ability to test all the proteins that are on the surface of the

bacterium and that is the next stage of the process."

If funding applications for \$500,000 are successful, the first sheep vaccine trials will be held at the end of this year at the University of Sydney. A commercial partner will eventually need to be found to register the vaccine.

Footrot costs farmers in Australia up to \$100m a year in lameness and condition loss, and it is also an expensive problem in New Zealand.

Hood said the \$2m spent so far in the eight-year project would be overshadowed by the eventual gains from a footrot vaccine.

"I don't know any figures for New Zealand, but I guess it would be significant and there is (also) the cost from the rest of the world."

Hood said the team had a good relationship with New Zealand scientists such as Dr Jon Hickford at Lincoln University's Gene Marker Laboratory.

"We are doing different things and we are taking a global vaccine approach. It is not a matter of being ahead, it is a matter of doing different things."