



NovaUCD

Technology Transfer Opportunity

Novel Vaccine for Protection against Liver Fluke Disease in Cattle and Sheep

OPPORTUNITY:

Novel vaccine for protection against Liver Fluke disease in cattle and sheep.

Description of Technology:

This vaccine is based on a recombinant antigen expressed by cDNA, which encodes for a proteolytic enzyme secreted by the liver fluke parasite. Initially, the native protease was isolated from the parasite and cattle vaccinated with the purified enzyme were shown to have protection against the parasite. Furthermore, production of viable parasite eggs was also prevented.

A recombinant version of the native protein has now been produced by inserting cDNA for the enzyme into a yeast expression system. The isolated product is highly stable and a purification procedure has been developed to provide high quality yields of the protein. The product was tested in cattle and sheep and provided similar levels of protection to those achieved with the native protein. Current work is focused on developing a formulation and administration regime which will induce maximal protection using the most commercially viable adjuvant.

Value Proposition:

Control of liver fluke disease (fasciolosis) currently relies on administration of anti-helminthic drugs. Such chemical treatments are now unsatisfactory, as drug-resistant parasite populations have risen to critical levels. Development of new chemical therapeutics is now less attractive as long discovery times, costly registration, testing requirements, environmental objections and human health concerns add to the list of issues.

Consequently, market indications are that there will be a decline in the supply of effective drug treatments for liver fluke. As the availability of effective anti-parasitic drugs declines, the only viable solution for control and elimination of the disease is through the use of vaccines. This novel antigen has demonstrated effective protection against the parasite in cattle and sheep and the first ever liver fluke vaccine is now in the final stages of development, offering an effective tool towards elimination of the disease. The global market opportunity for this vaccine is US\$182m.

Market:

Fasciolosis is one of the most common parasite diseases affecting domestic animals and is increasing in prevalence in humans with an estimated 20 million people infected worldwide. Annual losses to the world's agricultural community due to liver fluke infestation are estimated to be in excess of US\$2 billion.

The main market opportunity is in those countries with intensive cattle and sheep farming industries – Australia, Argentina, Brazil, Europe, New Zealand and the USA. Ireland and the UK represent a market size of US\$31m and the rest of Europe accounting for US\$49m.

Inventors:

Professor Grace Mulcahy, UCD School of Agriculture, Food Science and Veterinary Medicine and Professor John Dalton (Associated Faculty Member).

Publications:

Mulcahy, G. and Dalton, J.P. (2001) Cathepsin Ls as vaccine against liver fluke disease. Res. Vet. Sci. 70, 83-86.

Status:

A method for preparation of the vaccine has been patented and is underpinned by secret know-how in the production and purification of the unique recombinant antigen. Furthermore, a novel rapid diagnostic assay has also been developed for detection of liver fluke, thus greatly enhancing market penetration for the vaccine through early disease diagnosis and monitoring of treatment regimes.

Opportunity Sought:

A suitable co-development partner and licensee is sought for cooperation on optimisation of the vaccine formulation, performance of field trials and registration of the final product.

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