

Parasitology Expertise

The Moredun Research Institute's parasitology group address the urgent need to maintain control over endemic parasitic diseases of livestock. The group conducts research on a range of parasites that have both economic and welfare implications to the farming industry worldwide. A number of the parasites worked on at Moredun are also important zoonotic pathogens that may cause disease in humans.

Focus areas include:

- **Gastrointestinal nematodes**

Resistance to anthelmintic drugs is increasing, and hence development of control strategies is a key focus with vaccination and sustainable anthelmintic usage as prime objectives. The use of genomic, transcriptomic and proteomic approaches aims to provide definition of the host/parasite relationship at the molecular level providing valuable insight that is used in vaccine and diagnostic development.

- **Liver fluke**

Liver fluke infection is a significant issue for cattle and sheep health and productivity. Improved diagnosis of active fluke infection is a target through evaluation of existing and novel diagnostic tests using experimental challenge models and field samples. Investigation of flukicide resistance and development of improved tools for prediction of disease risk are active areas of research in addition to the identification of novel vaccine targets.



- **Protozoan parasites**

Research projects target the control and prevention of diseases of livestock caused by protozoan parasites. For *Neospora caninum* an objective is to develop an early diagnostic test. Researchers are looking at tissue cyst contamination of meat in the main livestock species *Toxoplasma gondii* and for *Cryptosporidium*, parasite transmission on farm and in water catchments, along with immunological studies, are the main areas of research.

- **Ectoparasites**

Sheep scab (psoroptic mange) – research projects at Moredun seek to understand the mechanisms of immunity to the sheep scab mite, *Psoroptes ovis*, with the aim of developing effective vaccines and diagnostic tests.
Poultry red mite – vaccination offers a safe, effective alternative to chemical treatments. Research is focused on producing a vaccine based on recombinant proteins.



- **Research Outputs**

Vaccines - Barbervax® a vaccine for Barber's pole worm (*Haemonchus contortus*), is the first commercially available vaccine for any nematode parasite of any host. A recombinant vaccine for the control of *Teladorsagia circumcincta* in sheep is currently under development.

Diagnostic Tests – examples include a diagnostic blood test for *Psoroptes ovis* infestation in sheep (sheep scab)

Disease Control Measures – guidelines for sustainable parasite control using improved on-farm management strategies such as targeted selective treatment with anthelmintic drugs.

- **Collaborative research**

MoreDun is involved in a number of research projects with industrial and academic research partners and welcomes new enquiries for collaborative projects. The MoreDun Research Institute is the co-ordinator of a multinational EU project (PARAGONE) which aims to develop vaccines against a range of veterinary parasites.

- **Commercial services**

MoreDun Scientific, a commercial arm of the MoreDun group, conducts contract efficacy and safety studies for candidate veterinary medicinal products for the animal health industry. A wide range of endo and ecto parasitic disease models are available for client studies (bovine, ovine, equine, avian, natural and experimental infections). Development and validation of new models is available on request.

