

Press Release

Breaking new ground for sustainable parasite control

PARASOL – a European Framework 6 funded project

Gent, May 2006. The European Union has provided 2.9 Million Euro for an international research project to investigate and develop sustainable, low-input methods for internal parasite control in ruminants (Target Selective Treatments). The project known as PARASOL (Para-site Solutions), an abbreviation for “Novel solutions for the sustainable control of nematodes in ruminants”, has been designated for a period of three years and involves 12 academic partners and 5 business ventures from 7 EU countries as well as Africa. The project is coordinated by Professor Jozef Vercruysse of the University of Gent. Among the partners are the University of Bath, Department of Biology & Biochemistry, represented by Dr. Adrian Wolstenholme, the University of Bristol, School of Veterinary Medicine, represented by Dr. Gerald Coles and Dr. Eric Morgan, the Moredun Research Institute, Penicuik, Edinburgh, represented by Dr. Frank Jackson as well as Innovis Ltd., Peithyll Centre Capel Dewi, Aberystwyth, represented by Mr. Eurion Thomas.

Announcing the new project which has begun in March, Professor Vercruysse stressed the importance of effective chemical anthelmintics for the control of gastro-intestinal worms of ruminants as these pose the greatest threat to animal welfare and production. He also pointed out that current conventional treatment methods, such as the repeated dosing of whole herds with synthetic anthelmintics, are not sustainable as they produce food and environmental residues and promote the spread of anthelmintic resistance (AR) by failing to leave an untreated parasite population in refugia. As discontinuing the use of effective chemical anthelmintics is neither practical on animal welfare or economical grounds, the PARASOL-Project aims to reduce the need for drugs by developing Target Selective Treatments (TST) for animals showing clinical signs of parasitic disease or reduced productivity only. Animals with low worm burdens do not show symptoms and therefore do not require treatment. These strategies will thus reduce the risks of residues in food and in the environment and provide a parasite population *in refugia* to limit the development of anthelmintic resistance.

In order to achieve their goal, the PARASOL-Partners will: (1) determine the best methods of identifying animals and herds requiring anthelmintic intervention; (2) standardise existing tests for detecting anthelmintic resistance and develop new tests, if the current ones are inadequate; (3) optimise the efficacy and bioavailability of anthelmintics by modulating parasite P-glycoprotein detoxification systems and (4) assess the effect of targeted selective treatments on productivity, animal welfare and the spread of AR genes under a wide range of farming conditions. “By the end of the project, we will provide farmers, veterinarians and advisors with clear guidance and protocols for sustainable, low-input, user- and consumer-friendly nematode control”, so Professor Vercruysse.

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Notes for the editor:

- 1. European Framework 6 Program (FP6):** The Framework Program (FP) is the European Union's main instrument for funding research in Europe. Six Framework Programs (FPs) have been implemented since 1984, each covering a period of five years with the last year of one FP and the first year of the following FP overlapping. The current sixth FP (FP6) aims to contribute to the creation of a true "European Research Area" (ERA). ERA is a vision for the future of research in Europe, an internal market for science and technology. It fosters scientific excellence, competitiveness and innovation through the promotion of better co-operation and coordination between relevant actors at all levels. The biggest part of FP budget will be spent on focussing and integrating future research activities on seven thematic priority areas such as Food Quality and Safety.
- 2. Gent University, Faculty of Veterinary Medicine, Laboratory of Parasitology, Merelbeke, Belgium**

The Laboratory of Parasitology of the Gent University, Faculty of Veterinary Medicine, employs a total of about 22 veterinarians, biotechnologists and laboratory technicians with expertise ranging from parasite epidemiology and immunology to helminth molecular biology. The research group has extensive experience with the epidemiology and control of gastrointestinal nematode infections in cattle and small ruminants in Belgium and the tropics and strong expertise in a broad range of biochemical and molecular techniques including anthelmintic resistance. Laboratory techniques such as ELISA, (Real-Time) PCR, polymorphism and proteomic techniques, recombinant protein production and chromatography are applied routinely.
- 3. University of Bath, Department of Biology & Biochemistry, Bath, England, U.K.**

The Department of Biology & Biochemistry at Bath has a total of about 150 staff plus about 70 postgraduate research students. The Department has a major strength in invertebrate biology and is a leader in studying macrocyclic lactone action in parasitic nematodes, and in developing functional assays, using ligand-binding and electrophysiology techniques. This expertise is now being applied to all the major groups of anthelmintics. The Dept of Biology & Biochemistry carries out international quality science on insecticide and antibiotic resistance. It contains a wide range of modern equipment and a genomics unit with high-throughput DNA sequencing and microarray readers, together with a dedicated bioinformatics server. The nematode laboratory is well equipped for molecular biology, including real-time PCR. We have facilities for electrophysiology on *Xenopus* oocytes and pharmacological analysis via radioligand binding, making us ideally suited to the work proposed, determining the basis of ML resistance in *Haemonchus contortus* and other species, and using this information to develop and test novel molecular diagnostics. The Department has played a role in several EU projects, currently including HPRN-CT-2002-00258 and is a Marie Curie Training Site 'Post-genomic analysis of microbial virulence' Contract: HPMT-CT-2001-00288.
- 4. University of Bristol, School of Veterinary Medicine, Bristol, England, U.K.**

Driven by the needs of the European farming community, the Bristol group has been a leader and vocal advocate for studies on anthelmintic resistance for many years. In 1994, they organised an EU funded conference on anthelmintic resistance in Brussels. They have considerable expertise in the isolation and production of parasites, in field and laboratory anthelmintic trials and in the development and optimisation of biologi-

cal assays for resistance, being first to describe the larval development test. They have been responsible for many of the first reports of anthelmintic resistance in the U.K., including triple resistant worms in goats and the isolation of the first macrocyclic lactone-resistant cattle parasites in the northern hemisphere. They are the first veterinary school in Europe to purchase and study New Zealand Romney sheep that are resilient to nematodes. The group also has expertise in the population dynamics of ruminant nematodes, which equips them to assess the epidemiological consequences of altered anthelmintic treatment strategies. Being in probably the most intensive cattle and sheep producing area of Europe, Bristol vet school is ideally suited to the work in research on cattle and sheep nematodes and the development and standardisation of tests for resistance.

5. Moredun Research Institute, Penicuik, Edinburgh, EH26 0PZ, Scotland, U.K.

Moredun Research Institute is a disease research institute that specialises in diseases of livestock, particularly sheep. The institute has two farms and excellent animal breeding, rearing, and accommodation together with very modern laboratory facilities. The parasitology division (30 staff) maintains 8 different species of ovine gastrointestinal nematodes together with a number of anthelmintic resistant isolates. The majority of its Veterinary, Biology and Molecular Biology researchers are engaged on nematode research on vaccines, anthelmintic resistance, alternative approaches to control and immunoparasitology. The research group has extensive experience in the field of anthelmintic resistance particularly with regard to its epidemiology, prevalence and diagnosis. More recently the laboratory has begun to characterise a local triple resistant isolate of *Teladorsagia circumcincta* using *in vivo* (CET, FECRT) and *in vitro* (LMIA, LDA, LFIA) bioassays and molecular approaches (multiplex PCR, sage, microsatellite markers). Moredun Research Institute has held previous EU grants in a number of different research areas concerned with infectious diseases and parasitology. The group used in PARASOL has been involved in 3 parasitological programmes (Fair 3 CT 96-1485; QLRT – 2000-1843 WORMCOPS and a STREP REPLACE).

6. Innovis™ Ltd mission is:- ‘To provide the livestock industry of the UK with a first class artificial breeding service for livestock and to use this established customer base to introduce new complimentary services in, scrapie genotyping; parasitology; disease monitoring; breeding consultancy and reference databases; electronic identification and traceability.’ The company has evolved from a spin-out company (CBS Technologies) from the University of Wales Aberystwyth in 2002, acquiring at the time the Edinburgh Genetics’ Malvern Centre. In 2005 Innovis acquired Britbreed Ltd in Scotland providing the opportunity to extend the services to clients in Scotland and the North of England. Innovis™ Limited currently employs 50 staff, operating out of five (5) sites in Wales, England and Scotland. The company’s main office is at Peithyll Centre, Aberystwyth, Ceredigion, Wales, SY23 3HU.