



Horserace Betting Levy Board

Veterinary Bulletin Autumn 2014



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50 Years of Research Funding

HBLB recently celebrated 50 years of funding equine veterinary research and education, during which time we have invested some £47 million towards improving the health and welfare of racing and breeding Thoroughbred horses. This has led to significant advances in the understanding, prevention, treatment and management of a wide variety of health issues affecting this breed and horses in general.

HBLB awards three different types of grant:

- Research projects
- Small projects
- Scholarships

Our Veterinary Bulletin provides a summary of some of the activities we are funding and an overview of our support of the veterinary profession. It includes an explanation of how the veterinary research and education

budget is spent, together with details of the grant application process. Further information can be obtained by contacting: Annie Dodd, Grants Manager, (annie.dodd@hblb.org.uk) or Laura Barron, Grants Officer, (equine.grants@hblb.org.uk).

HBLB resumes sponsorship at BEVA Congress

The HBLB makes a considerable investment each year in veterinary research and education. We also recognise that this will only realise its maximum potential if we communicate our activities and results effectively to members of the veterinary profession. In our opinion, one of the most important means

of achieving this is via the Annual BEVA Congress and, for this reason, we are distributing our new-style Veterinary Bulletin with delegate packs at Congress, as well as sponsoring a number of relevant events, namely:

- Professor May's plenary lecture on the Opening Day

- Sessions on:
 - 'Racehorse Medicine' and 'Juvenile Medicine' on Friday 12th September
 - 'What Genomics Can Do For The Horse And Vet' and 'Exotic Infections' on Saturday 13th September

What is the Horserace Betting Levy Board and what does it have to do with veterinary science?

The Horserace Betting Levy Board (HBLB) is a statutory body required to collect a levy from the horseracing business of UK bookmakers. This is then utilised for the improvement of horseracing and breeds of horses; and for the advancement of veterinary science and education.

The HBLB is advised on its veterinary investment by a Veterinary Advisory Committee (VAC). The VAC also consults with representatives of the racing industry and the equine veterinary profession to identify the research scope and priorities for the benefit of the Thoroughbred.

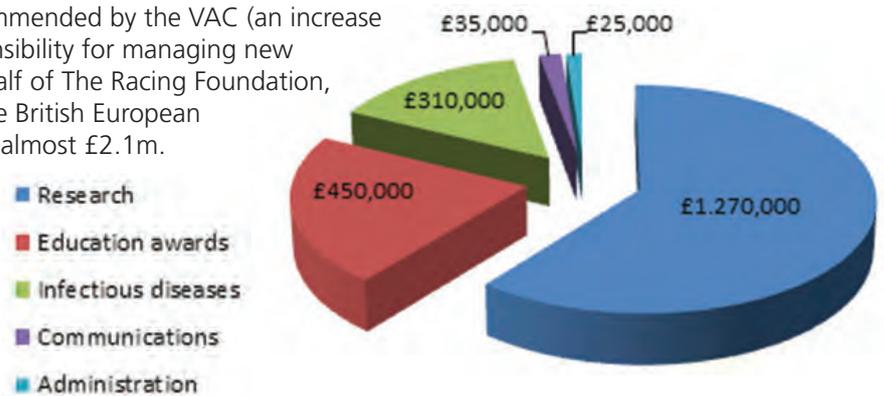
HBLB funding of equine veterinary science and education facilitates the acquisition of new knowledge and skills that are essential to the health and welfare of the horses on which the racing industry ultimately depends.

HBLB Veterinary Expenditure 2014

In 2014, £1.8m was allocated to activities recommended by the VAC (an increase of 12.5% over 2013). HBLB also took on responsibility for managing new veterinary scientific research investment on behalf of The Racing Foundation, the Thoroughbred Breeders' Association and the British European Breeders Fund, increasing the overall budget to almost £2.1m.

In 2014 work began on

- 7 research projects (61% of the budget)
- 3 Research Scholarships
- 1 Clinical Scholarship
- 10 small projects.



Who are the members of the HBLB VAC?

<p>Professor Willie Donachie BSc PhD CBiol FSB <i>Director, Moredun Research Institute, Edinburgh</i></p>	<p>Chair of VAC <i>Primary expertise: Bacteriology, microbiology, immunology</i></p>
<p>Professor Celia Marr BVMS, MVM, PhD, DEIM, DipECEIM, MRCVS <i>Veterinary Practitioner, Rosedale & Partners, Newmarket</i></p>	<p>Deputy Chair of VAC Chair of Thoroughbred Research Consultation Group Member of Education Sub-Committee <i>Primary expertise: Internal medicine, cardiology</i></p>
<p>Professor Colin Farquharson BSc PhD <i>Chair of Skeletal Biology, Roslin Institute, University of Edinburgh</i></p>	<p><i>Primary expertise: endocrinology, orthopaedics</i></p>
<p>Professor Peter O' Shaughnessy BSc PhD <i>Professor of Reproductive Biology, University of Glasgow</i></p>	<p>Member of Education Sub-Committee <i>Primary expertise: Reproduction, developmental biology, endocrinology</i></p>
<p>Professor Chris Proudman MA Vet MB PhD Cert EO FRCVS RCVS <i>Head of School of Veterinary Medicine, University of Surrey</i></p>	<p>Member of Thoroughbred Research Consultation Group <i>Primary expertise: Orthopaedic surgery, internal medicine, parasitology</i></p>
<p>Professor Stuart Ralston MB ChB MRCP MD FRCP FRSE <i>Head of School of Molecular & Clinical Medicine and Chair of Rheumatology, University of Edinburgh</i></p>	<p>Member of Education Sub-Committee <i>Primary expertise: Rheumatic disease, molecular genetics, molecular and cell biology</i></p>
<p>Mr Chris Rea BVM&S MRCVS <i>Veterinary Practitioner, Three Counties Equine Hospital, Tewkesbury</i></p>	<p>Chairman of Codes of Practice Sub-Committee <i>Primary expertise: Lameness, orthopaedics, soft tissue surgery</i></p>
<p>Professor Falko Steinbach PhD MRCVS <i>Head of Mammalian Virology, Animal Health and Veterinary Laboratories Agency (AHVLA), Surrey</i></p>	<p><i>Primary expertise: Virology, immunology</i></p>

How the funding process works

HBLB's veterinary research funding supports work aimed at:

- benefiting the health and wellbeing of horses, particularly the Thoroughbred
- minimising the impact and improving the clinical management of disease and injury in all age groups
- promoting successful breeding and production
- preventing and treating injury in racehorses.

The review process is informed by the priorities of key industry stakeholders and scientific merit is the most important criterion by which applications are assessed. Projects should address a clearly defined hypothesis with specific, measurable, attainable, relevant and timely objectives.

The current strategic research priorities are:

- Improved prevention of current and emerging infectious diseases by the development of more effective vaccines, diagnostic tools, biosecurity and management strategies;

- Improved training environment and racecourse design and surfaces, riding strategies, tack and equipment to enhance the safety, health and well-being of racehorses;
- Improved methods of identification, management and prevention of musculoskeletal disease and injury in Thoroughbreds;
- Improved male and female reproductive efficiency.

The full scope of HBLB's veterinary research interests is published on www.hblb.org.uk. Key announcements, summaries of selected completed HBLB-funded research projects and other relevant articles can be found on racehorsehealth.hblb.org.uk.

New posts in 2014 include:

- *Streptococcus zooepidemicus*: bet hedging and equine respiratory disease
Dr Andrew Waller, Animal Health Trust

- An investigation of the building blocks (mucins) of lung mucus in horses with recurrent airway obstruction
Adele Williams, University of Manchester
- Re-programming of equine fibroblasts into induced pluripotent stem cells
Dr Xavier Donadeu, Roslin Institute, University of Edinburgh
- Non-invasive monitoring of changes in exhaled markers of airway inflammation in Thoroughbred racehorses
Michael Cathcart, University of Glasgow



New Research projects starting in 2014

<p>Assessment of a pili-based <i>Rhodococcus equi</i> vaccine in foals</p> <p>University of Edinburgh Prof Jose Vasquez-Boland</p>	<p><i>Rhodococcus equi</i> is a pathogenic bacterium that causes a life-threatening respiratory illness in foals. Rhodococcal pneumonia has a major economic impact on the Thoroughbred industry and remains an unresolved problem due to the lack of an effective vaccine to control the infection in endemic studs.</p>
<p>Development of synthetic vaccines for African Horse Sickness</p> <p>University of Glasgow Prof Massimo Palmarini</p>	<p>Currently there is no vaccine registered for the control of African Horse Sickness Virus (AHSV) in Europe. AHSV is highly related to bluetongue virus (BTV) and both viruses are transmitted by <i>Culicoides</i> biting midges. The recent outbreaks of BTV and Schmallenberg virus in Europe have proven that exotic diseases transmitted by <i>Culicoides</i> have the potential to enter, and moreover become endemic, in the UK.</p>
<p>Early detection of musculoskeletal injury in the Thoroughbred through monitoring of movement symmetry</p> <p>Royal Veterinary College Dr Thilo Pfau</p>	<p>Combining state-of-the art mobile gait analysis with computerised decision making, this study aims to identify gait parameters that maximise the likelihood of identifying developing injuries at the earliest possible stage. This is an essential step towards minimising injuries and maximising welfare and performance, leading to quantification of horse, track and training related parameters in relation to the risk of injury.</p>
<p>Randomised controlled trial of <i>Clostridium botulinum</i> type C vaccination for prevention of Equine Grass Sickness (EGS)</p> <p>Animal Health Trust Dr Jo Ireland</p>	<p>This project plans to determine the efficacy of <i>Clostridium botulinum</i> type C vaccination in preventing EGS by performing a nationwide randomised controlled field trial, comparing EGS incidence between groups of horses receiving vaccination or a placebo. The trial will recruit 1,100 horses for a 2-year period from premises previously affected with a high incidence of EGS. Demonstration of reduced disease incidence in vaccinated horses would provide a major breakthrough in the prevention of EGS, benefiting equine health and welfare.</p>
<p>Nature versus nurture: modelling environmental and genetic contributions to risk of racecourse injury in UK Thoroughbreds</p> <p>Royal Veterinary College Dr Kristien Verheyen</p>	<p>As well as being of concern for equine welfare reasons, racecourse injuries cause economic losses and damage the public perception of racing. This project will establish the causes of injury and death in British flat racing, and identify risk factors for these injuries, using all available data from the past 13 years (2000-2012). Trends in injury rates will be evaluated. In addition, genetic contributions to racecourse injury occurrence will be investigated by measuring heritability of injury susceptibility and the correlation between performance and susceptibility to injury. Results can be used by policy makers to inform strategies aimed at reducing injury occurrence on British racecourses. Information on heritability and the association between predisposition to injury and performance can inform breeding practices to enhance performance while minimising injury risk.</p>
<p>Exploring new sources of stem cells in horses</p> <p>University of Edinburgh Dr Xavier Donadeu</p>	<p>This study intends to identify new sources of mesenchymal stem cell sources for therapeutic and/or investigative purposes.</p>
<p>New roles for osteocyte in the aetiopathogenesis of stress fractures</p> <p>University of Cambridge Dr Frances Henson</p>	<p>This pilot study will investigate mechanisms underlying targeted remodelling of the distal third metacarpal bone (MCIII) in response to stress fractures (SF). Long bone fractures have significant welfare/economic implications to the horseracing industry. These fractures are either one-off overload incidents or due to repetitive microdamage from high intensity exercise. The key to fracture prevention is a clear understanding of their aetiopathogenesis. Bone is constantly remodelled to adapt to the demands placed upon it, including repair damage ('targeted remodelling (TM)'). SFs are a failure of TM during high intensity exercise, when bone resorption exceeds bone formation.</p>

Racing organisations investing jointly in Thoroughbred health

When reviewing grant applications, HBLB's objective is to identify scientifically robust work that will benefit the racing and breeding Thoroughbred. Racing's stakeholders, such as the Thoroughbred Breeders' Association (TBA) and the Racehorse Owners Association (ROA) are included in the consultation process, sometimes directly and otherwise through the sport's governing body, the British Horseracing Authority.

In 2013 the TBA sponsored a research scholarship at the RVC including a project investigating the risk factors and pathologies associated with early

pregnancy loss in Thoroughbreds.

For 2014, the HBLB veterinary science programme was boosted by further external funding. The TBA is supporting a small project looking at *Lawsonia intracellularis*, a significant threat to foals and youngstock. The British European Breeders Fund has taken on 2 small projects, one examining the virulence of *Rhodococcus equi* and the other investigating the effect of light and temperature on ovulation.

The Racing Foundation, a fund created from the proceeds of the sale of the

Tote, is part-funding a number of major projects - the top 4 listed on the page opposite.

The VAC Chairman, Professor Willie Donachie, welcomed this collaborative approach, saying:

"The new co-ordination of equine veterinary research investment, bringing together a number of funding streams, is a very welcome step forward. This clear demonstration of the industry's confidence in the VAC's assessment and management protocols is much appreciated".

New 'Small Project' category

Launched in 2013, this new funding category is intended to support research projects focusing on specific issues of direct and immediate practical importance to the health and

wellbeing of the Thoroughbred. The grants are open to individuals based in veterinary schools and institutes, and also to veterinary practitioners and others working in the Thoroughbred

racing and breeding industry. The projects should take no longer than one year and cost no more than £10,000.

The projects beginning in 2014 are:

Kate Allen <i>Bristol</i>	Development of a novel technique for assessing and improving respiratory performance in racehorses
Colin Barker <i>Animal Health Trust</i>	Technical transfer and validation of an EHV-1 and EHV-4 ELISA
Emily Haggett <i>Rossdale & Partners</i>	Serial investigation of seroprevalence and faecal shedding of <i>Lawsonia intracellularis</i> in Thoroughbred foals in the first year of life
John Marshall <i>Glasgow</i>	Validation and development of an inertial-sensor method of gait analysis in the Thoroughbred racehorse
Helen Morrell <i>Harper Adams</i>	Effect of shortwave ultrasound to tendon-like constructs cultured from adipose derived mesenchymal stem cells <i>in vitro</i> on tissue strength and elasticity
Pablo Murcia <i>Glasgow</i>	An equine-specific <i>in vitro</i> assay to study equine influenza pathogenesis
Paul Pryor <i>York</i>	Identifying virulence factors in the horse pathogen <i>Rhodococcus equi</i> that allows intracellular pathogen survival
Carolyn Tranquille <i>Animal Health Trust</i>	Pilot investigation into the involvement of a low oxygen environment in the pathogenesis of lateral condylar fracture in Thoroughbred racehorses
Renate Weller <i>RVC</i>	How best to support collapsed heels? – the effect of farriery intervention on hoof deformation
Sandra Wilsher <i>Mellon Laboratory</i>	Roles of light and temperature on delayed ovulation in maiden and barren, and anovulation in foaling, Thoroughbred mares

Education Awards

The aim of the Scholarship Programme is to produce a pool of highly skilled equine veterinary researchers and clinicians. The 2 types of Education Awards for qualified veterinary surgeons are:

- Senior Clinical Research Scholarship – supporting specialised higher clinical or pathology training
- Research Training Scholarship – leading to a PhD



The current Clinical Scholars, with their particular field of research, are:

Kerstin Erles	Royal Veterinary College	<u>Veterinary Pathology</u> What is the prevalence of equine herpesvirus-1 (EHV-1) infection of equine ovaries?
Matthew Robin	University of Liverpool	<u>Equine Internal Medicine and Infection Diseases</u> The threat of African horse sickness virus in the UK: furthering our understanding of vector biology and how best to protect horses in the event of an outbreak
Laura Fitzharris	University of Bristol	<u>Equine Sports Medicine</u> Evaluation of the validity of respiratory muscle training as a non-surgical treatment for upper airway collapse

The current Research Scholars, with their particular field of research, are:

Ebony Escalona	University of London	<u>Metabonomics and metagenomics</u> Metabonomic and metagenomic characterisation of Thoroughbred racehorse intestinal function
Rebecca Parkes	Royal Veterinary College	<u>Equine Locomotor Biomechanics</u> Intrinsic and extrinsic factors affecting the loading environment of the equine distal limb
Rhiannon Morgan	University of Liverpool	<u>Equine Arthritis</u> Development of sustained release, anti-cytokine siRNA therapy for equine arthritis
Nuria Terron Canedo	University of Glasgow	<u>Oncology/Virology</u> Micro RNAs and equine tumours
Cara Hallowell	University of Liverpool	<u>Parasitology</u> Parasite control on Thoroughbred studs
Rebekah Kennedy	University of Glasgow	<u>Equine periodontal disease</u> Microbiological and immunological aspects of equine periodontal disease
Alexandra Draper	Royal Veterinary College	<u>Equine Recurrent Laryngeal Neuropathy</u> Aetiology and pathogenesis of Equine Recurrent Laryngeal Neuropathy
Caroline Chauché	University of Glasgow	<u>Virology: Equine Influenza</u> Molecular pathogenesis of equine influenza virus
Zofia Lisowski	University of Edinburgh	<u>Equine colic, intestinal inflammation and dysfunction</u> Targeting the macrophage and mast cell in equine postoperative ileus

Equine Infectious Disease

In Britain in 2013 there were 10,146 races with 90,836 runners at 58 racecourses. Combined with an ever increasing number of horses travelling internationally to race, there is enormous potential for large scale transmission of infectious disease in the racehorse population. Outbreaks of highly infectious diseases, such as equine herpesvirus and equine influenza, have serious consequences for the welfare of horses, as well as disrupting racing and training activities on a local and national scale.

Protecting the health of the UK racehorse population is essential to

safeguarding both the welfare of the horses and the day-to-day running of the racing industry. For this reason, the HBLB funds an equine influenza programme and, together with the Racehorse Owners Association and Thoroughbred Breeders' Association, a programme for other infectious disease services, based at the Animal Health Trust in Newmarket.

In 2014, the HBLB will apply some £300,000 (2013: £300,000) to the equine influenza programme and the AHT's infectious disease services, to help protect racehorses and the racing industry.

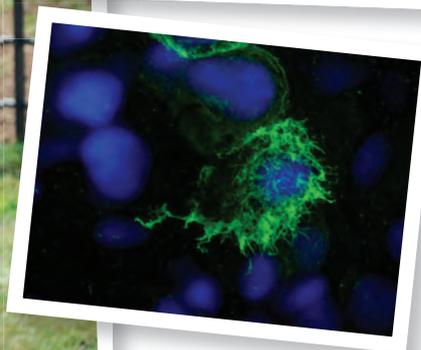
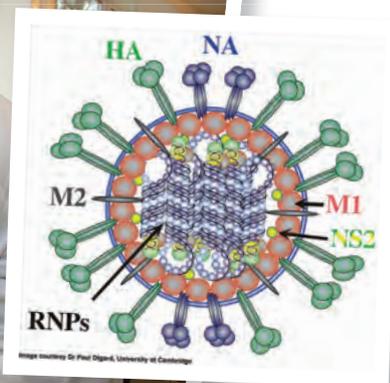
Codes of Practice

The HBLB Codes of Practice set out voluntary recommendations intended to help breeders and others, work with their vets on the prevention and control of a range of infectious diseases that may affect any horse or pony. Included is advice on the following 6 diseases plus additional guidelines on *Streptococcus equi* and artificial insemination:

- Contagious equine metritis CEM
- Equine viral arteritis EVA
- Equine herpesvirus EHV
- Equine coital exanthema ECE
- Equine infectious anaemia EIA
- Dourine

The Codes are reviewed on an annual basis in consultation with the relevant authorities in France, Germany, Ireland and Italy.

They are available in full on line at www.codes.hblb.org.uk



HBLB Veterinary Science and Education Awards: 2015 Applications

The detailed schedule for the 2015 application round, for awards to start in 2016, will be announced in Spring 2015. As a guide, the following is an approximate timetable covering all grant funding:

Late March/early April 2015	Announcement of new funding round Research Project applications via the Equine Grants System Small Project applications using form found on HBLB website Clinical and Research Scholarship applications using form found on HBLB website
June/July	Application deadlines
August/September	Review stages
November	Autumn VAC meeting to decide funding recommendations
December	Approval of budget by HBLB
January 2016	Press Release announcing projects and scholarships starting in 2016

Further information, including grant terms and conditions, can be seen on www.hblb.org.uk

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