



Equine veterinary science and education: a priority for the future

Celia Marr, Chair of the HBLB Veterinary Advisory Committee (VAC).

It is impossible to quantify the benefit derived from over 5 decades of HBLB funding to equine veterinary science within the UK and worldwide, but it has been substantial. In the last 15 years over £32 million has been allocated and since 1961 HBLB has funded almost 500 projects. Prevention and improved management of infectious disease and musculoskeletal injury have consistently been areas of major investment. In its earlier years, HBLB funding allowed the veterinary schools to develop expertise and facilities for the classical veterinary disciplines, whereas the current emphasis is to apply cutting edge epidemiological, genetic and molecular tools to address common problems among Thoroughbreds.

Arguably, HBLB's biggest contribution to veterinary science is investment in people, including 198 Research Scholars and 52 Clinical Training Scholars. Many of these have gone on to senior positions within academia, industry or practice. These scholarships ensure that the best veterinary graduates can be attracted towards equine work.

Currently, equine clinical departments in all UK vet schools are led by individuals who were HBLB Scholars. HBLB funding also supports meetings to disseminate knowledge about Thoroughbred health and disease and has been a byword for biosecurity through its support of disease surveillance and the Codes of Practice for equine breeders. The most recent iteration of this has been EquiBioSafe (see Page 7).

Meanwhile, options for revising racing's financial structure are under discussion. Whatever the outcome, it is essential that investment in equine veterinary science and education continues.

The ability to plan over a longer time frame than the current annual cycle will enable grants to be offered on a competitive, science-driven basis. We should encourage partnerships that add value to racing's resources. Examples might include partnering with other educational funders to ensure that the UK continues to train world-leading scientists; and collaborative funding with bodies supporting non-Thoroughbred research in areas of common interest such as infectious disease. By forming international

funding consortia, British Racing could lead global efforts to address equine injury and disease. There is much to be done in the next 12 months to determine how any new arrangement will look. There is an opportunity to develop a research funding mechanism for racing which keeps the independence and scientific rigour of the current VAC but enhances this with an improved governance framework. The UK's 7 Research Councils serve as the gold standard for research governance. Working within a framework driven by excellence in research and investment in training, they deliver world class science in areas of strategic priority.

We must ensure that our research endeavour is relevant to the Thoroughbred, promotes multidisciplinary team building and focuses on areas where change can be implemented for maximum benefit to the Thoroughbred. It is also essential that racing evaluates the impact of its research investment objectively both to generate evidence of practical benefit and to inform future strategy. Whatever opportunities the future brings, we must look to restore Britain's place as a leader in equine welfare and science.

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

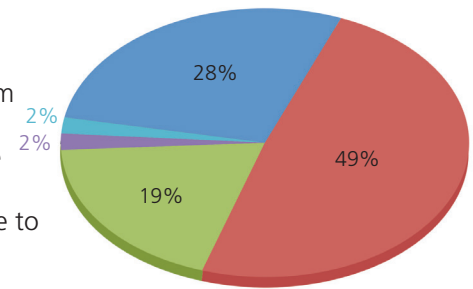
The Horserace Betting Levy Board (HBLB) is a statutory body required to collect a levy from the horseracing business of GB bookmakers, which it then distributes for the improvement of horseracing and breeds of horses and for the advancement of veterinary science and education.

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

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

HBLB Veterinary Expenditure 2016

Against the background of HBLB budget reductions spread across all areas, £1.48m was allocated in 2016 to activities recommended by the VAC (2015: £1.8m). HBLB will also continue to manage the veterinary scientific funding made available by the Racing Foundation, the Thoroughbred Breeders' Association and the British European Breeders Fund. This additional input increased the total funding available to more than £2.02m.



In 2016 work began on

- 4 new research projects (26% of the budget);
- 3 equine post doctoral fellowships (35% of the budget);
- 2 clinical scholarships (14% of the budget);
- 4 small projects (2% of the budget).

- Scientific research
- Education awards
- Disease control
- Communication
- Administration

Who is on the HBLB VAC?

<p>Professor Celia Marr BVMS MVM PhD DEIM DipECEIM MRCVS <i>Veterinary Practitioner, Rossdale & Partners, Newmarket</i></p>	<p>Chair of VAC Primary Expertise: Internal Medicine and Cardiology</p>
<p>Professor Matthew Allen MA Vet MB PhD <i>Professor of Small Animal Surgery, University of Cambridge</i></p>	<p>Primary Expertise: Orthopaedics and Musculoskeletal Oncology</p>
<p>Professor Gary Entrican BSc PhD <i>Principal Research Scientist, Moredun. Honorary Professor, University of Edinburgh</i></p>	<p>Member of the Education Sub-Committee Primary Expertise: Immunology and Vaccinology, Viral and Bacterial Infectious Disease</p>
<p>Professor Colin Farquharson BSc PhD MB <i>Professor of Skeletal Biology, Roslin Institute, Royal (Dick) School of Veterinary Studies, University of Edinburgh</i></p>	<p>Primary Expertise: Musculoskeletal Biology, Endocrinology and Orthopaedics</p>
<p>Ms Caroline George BVMS MRCVS <i>Veterinary Practitioner, Lambourn Equine Vets</i></p>	<p>Member of the Education Sub-Committee Primary Expertise: Racehorse and Sports Horse Medicine</p>
<p>Mr Rob van Pelt BSc BVSC MRCVS <i>Veterinary Practitioner, The Arundel Equine Hospital</i></p>	<p>Chair of the Codes of Practice Sub-Committee Primary Expertise: Stud and Racehorse Medicine and Surgery</p>
<p>Professor Chris Proudman MA Vet MB PhD CertEO FRCVS <i>Head of School of Veterinary Medicine, University of Surrey</i></p>	<p>Chair of Thoroughbred Research Consultation Group Primary Expertise: Gastroenterology, Parasitology and Epidemiology, General Surgery</p>
<p>Professor Falko Steinbach PhD MRCVS <i>Head of Mammalian Virology, Animal and Plant Health Agency</i></p>	<p>Primary Expertise: Virology and Immunology, Emerging Diseases</p>
<p>Professor Tom Stout MA Vet MB PhD MRCVS Dipl. ECAR KNMvD <i>Professor of Equine Medicine and Reproduction, University of Utrecht, The Netherlands</i></p>	<p>Chair of the Education Sub-Committee Primary Expertise: Reproduction and Stud Medicine</p>

HBLB's veterinary research funding

Our 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 single-most important criterion by which applications are assessed.

Projects should address a clearly defined hypothesis with specific, measurable, attainable, relevant and timely objectives.



Strategic research priorities 2016

- Improved methods of preventing current and emerging infectious equine diseases by the development of more effective vaccines, diagnostic tools, biosecurity and management strategies
- Increased safety, health and wellbeing of racehorses through the development of better training environment, stable and racecourse design and surfaces, riding strategies, management and husbandry, tack and equipment
- Prevention or minimisation of musculoskeletal disease and injury in Thoroughbreds through advanced identification and management
- Enhanced reproductive efficiency, health and wellbeing of the breeding Thoroughbred and youngstock

The full scope of HBLB's veterinary research interests is published on the website www.hblb.org.uk.

Summaries of selected completed HBLB-funded research can be seen on racehorsehealth.hblb.org.uk. Newly posted in 2016:

- **Epidemiology of joint injuries in Thoroughbreds in training**

K. Verheyen, J. Price, B. Jackson, J. Wood and S. Reed

- **Are specific changes in mucus biochemistry associated with respiratory dysfunction in the racing Thoroughbred?**

K. Rousseau, P. Clegg, R. Newton, and D.J. Thornton

- **Development of an equine tracheal cell culture model**

K. Rousseau, P. Clegg and D.J. Thornton

- **Evaluation of mast cell responses as a novel method to estimate equine cyathostomin burdens**

R. Clements

Racing invests in Thoroughbred health

When reviewing grant applications, HBLB's objective is to identify scientifically robust work that benefits the racing, breeding and/or rearing of Thoroughbreds. 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.

HBLB is delighted that investment in equine science and education continues to be a priority for racing's bodies. The HBLB is again managing projects funded by the TBA, the British European Breeders Fund and The Racing Foundation. The latter is a fund created from the proceeds of the sale of the Tote.



New research projects starting in 2016

Why do horses roar? – from the beginning to the end of recurrent laryngeal neuropathy

Royal Veterinary College
Professor Richard Piercy

*Supported by The Racing
Foundation*

For unknown reasons, recurrent laryngeal neuropathy (or 'roaring') is associated with degeneration of the nerve that supplies the larynx and it causes poor performance in racehorses. This study will include a series of experiments aimed at evaluating the function of the nerves that supply the larynx in horses of various sizes, and compare with the function of nerves in the limbs. If successful, the work will facilitate a practical diagnostic test that can be used to detect the earliest signs of disease in horses, before they become detectable by other means. The project will also examine some key pathological processes in the nerves that supply muscles in the horse larynx. The aim is to develop new tools to allow us to determine the reasons why nerves in certain horses degenerate with a view to discovering the cause and, potentially, novel treatments.

Putting inflammatory airway disease research back on track

Royal Veterinary College
Dr Jackie Cardwell

Inflammatory Airway Disease (IAD) is a common form of respiratory disease in British Thoroughbred racehorses and an important cause of reduced performance and lost training days. Case definitions vary but, in Thoroughbreds, IAD is usually defined by increased respiratory mucus, with or without evidence of inflammation in routine respiratory samples. However, published expert opinion on how IAD should be diagnosed recommends more invasive lung sampling and does not regard respiratory mucus as a reliable sign of lung inflammation. It is not known whether, or to what degree, British racing veterinarians are following these recommendations or how feasible it is for them to do so. This study will use formal approaches to investigate the amount and strength of research evidence available to support these recommendations, as well as British veterinarians' opinions, current practices and needs. Findings will ensure that future research can be appropriately tailored to British racing Thoroughbreds.

Establishing the safety of allogeneic equine embryonic stem cells for tendon regeneration

Animal Health Trust
Dr Debbie Guest

*Supported by The Racing
Foundation*

Tendon injuries occur frequently in Thoroughbreds and have a significant welfare and economic impact on the racing industry. Embryonic stem cells (ESCs) can turn into tendon cells and may provide an 'off the shelf' source of cells to aid tendon repair. However, ESCs would be used in horses unrelated to those from which they were derived and may be recognised as foreign by the immune cells of recipient horses. Previous work has shown ESCs do not produce an immune response. However, the challenge is to ensure that when the ESCs turn into tendon cells they remain immune privileged and do not change their properties when exposed to the inflammatory environment which is present in the acutely injured tendon. An established laboratory system will be used to determine the immunological safety of the ESCs specifically for tendon repair and support the clinical application of these cells.

Measuring local strain distributions through the equine SDFT as a novel indicator of injury risk: effective injury management and prevention

Queen Mary University of
London
Dr Hazel Screen

Injuries to the superficial digital flexor tendon (SDFT) are extremely common amongst racehorses, very difficult to treat, often career limiting and a major welfare concern. Injury is not surprising considering the extreme mechanical demands on the SDFT, and earlier *in-vitro* tests have identified why some SDFTs are fatigue resistant whilst others injure easily.

It is now known that sections of the SDFT must slide relative to each other for effective function, enabled by a low stiffness matrix. However, as the matrix stiffens (such as with age) it limits sliding, increasing injury risk.

The team has developed methods to characterise sliding between sections of the human Achilles tendon, and will transfer this expertise to investigating SDFT sliding. This work will use cadaveric legs to validate the measures, allowing comparison of *in-vivo* sliding with the team's wealth of knowledge of healthy tendon mechanics *in-vitro*.

The next step is to develop methods to investigate SDFT sliding *in-vivo*, developing a clinical diagnostic tool for assessing SDFT health and injury. A pilot longitudinal study of injured SDFTs, investigating how sliding alters during healing, will build the platform for a future larger study of SDFT healing, assessing our novel diagnostic tool for monitoring healing, to see if it can determine when a safe reintroduction to training can be considered.

Small Projects

With the continued support for small projects in 2016, 4 new pieces of work started this year. This award 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 2016 are:

Professor Mark Harris <i>University of Leeds</i>	Developing a culture-based model system to study the emerging hepatotropic equine pathogen, non-primate hepacivirus (NPHV)
Dr Cristina Esteves <i>The Roslin Institute, University of Edinburgh</i>	Exploring the potential of equine mesenchymal stem/stromal cells as antibacterial agents
Dr.-Ing. Thilo Pfau <i>RVC</i>	Validation of activity monitoring in the turned out horse: towards early detection of musculoskeletal problems
Alison Northrop <i>Anglia Ruskin University</i>	Enhancing track safety; managing the effect temperature has on the consistency of all-weather track surfaces in the UK

HBLB support for BEVA Congress 2016

On the opening day of Congress, Thursday 8th September, HBLB is supporting:

- Advanced Orthopaedics (3 sessions)

- Improving Veterinary Practice
 - Upper Respiratory Tract Disease
- and on Friday 9th September:

- Advanced Session on Foals

HBLB sees BEVA Congress as the most effective and direct way to communicate with equine vets working in research and practice.



Education awards

The aim of the scholarship programme is to produce a pool of highly skilled equine veterinary researchers and clinicians. The 2 existing categories 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:

Laura Fitzharris	University of Bristol	Equine Sports Medicine Evaluation of the validity of respiratory muscle training as a non-surgical treatment for upper airway collapse
Giulia Lipreri	University of Liverpool	Equine Surgery and Orthopaedic Research Long pastern bone fracture predictivity
Robyn Graham	University of Edinburgh	Equine orthopaedic diagnostic imaging and surgery Techniques for detecting pre-joint disease conditions
Alejandro Suárez-Bonnet	Royal Veterinary College	Veterinary Anatomic Pathology The species and prevalence of mycoplasmas in the airways of Thoroughbred horses
Francesca Worsman	University of Edinburgh	Equine Internal Medicine Real-time three-dimensional (4D) echocardiographic assessment of the equine left atrium

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

Cara Hallowell	University of Liverpool	Parasitology Parasite control on Thoroughbred studs
Rebekah Kennedy	University of Glasgow	Equine Periodontal Disease Microbiological and immunological aspects of equine periodontal disease
Alexandra Draper	Royal Veterinary College	Equine Recurrent Laryngeal Neuropathy Aetiology and pathogenesis of equine recurrent laryngeal neuropathy
Caroline Chauché	University of Glasgow	Virology: Equine Influenza Molecular pathogenesis of equine influenza virus
Zofia Lisowski	University of Edinburgh	Equine Colic, Intestinal Inflammation and Dysfunction Targeting the macrophage and mast cell in equine postoperative ileus
Robert Coultous	University of Glasgow	Infectious Disease Equine piroplasmosis – detection and transmission risk

NEW!!!!

In 2015 the HBLB launched a new Equine Post Doctoral Fellowship award to commence in 2016.

The Fellowship, tenable for 3 years, is aimed at individuals with exceptional PhDs, a veterinary degree and the skills and aptitude to develop an academic or clinical academic career in equine veterinary sciences with a particular focus on Thoroughbred racing, breeding and/or rearing.

Three Fellowships are underway:

Illaria Piras <i>Funded by HBLB</i>	University of Glasgow	Project area: Identification of virulence factors in different Equine Influenza strains.
Laura Peachey <i>Funded by the Thoroughbred Breeders' Association, The British European Breeders Fund and HBLB</i>	University of Cambridge	Project area: Investigation of associations between high cyathostomin levels and gut bacteria, and exploring the response of horse gut cells to cyathostomin infection.
Belinda Rose <i>Funded by the Thoroughbred Breeders' Association</i>	Royal Veterinary College	Project area: The genetics of placentation and early pregnancy loss, including impact of EHV.

Infectious Disease

In Britain in 2015 there were 10,041 races with 88,078 runners at 59 racecourses. Combined with an ever increasing number of horses travelling internationally to race, there is enormous potential for large scale transmission of infectious diseases in the racehorse population. Outbreaks of highly infectious diseases such as equine herpesvirus and equine influenza can 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 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, HBLB funds an equine influenza monitoring and research programme and, together with the Racehorse Owners Association and Thoroughbred Breeders' Association, an infectious disease surveillance service, based at the Animal Health Trust in Newmarket.

In 2016, the HBLB will apply some £366,000 to the AHT's equine influenza programme and the infectious disease services to help protect racehorses and, ultimately, the racing industry.

Codes of Practice

In 2016 the HBLB and National Trainers Federation together launched a mobile app bringing together the Codes of Practice relating to breeding operations and also training yards.



EquiBioSafe

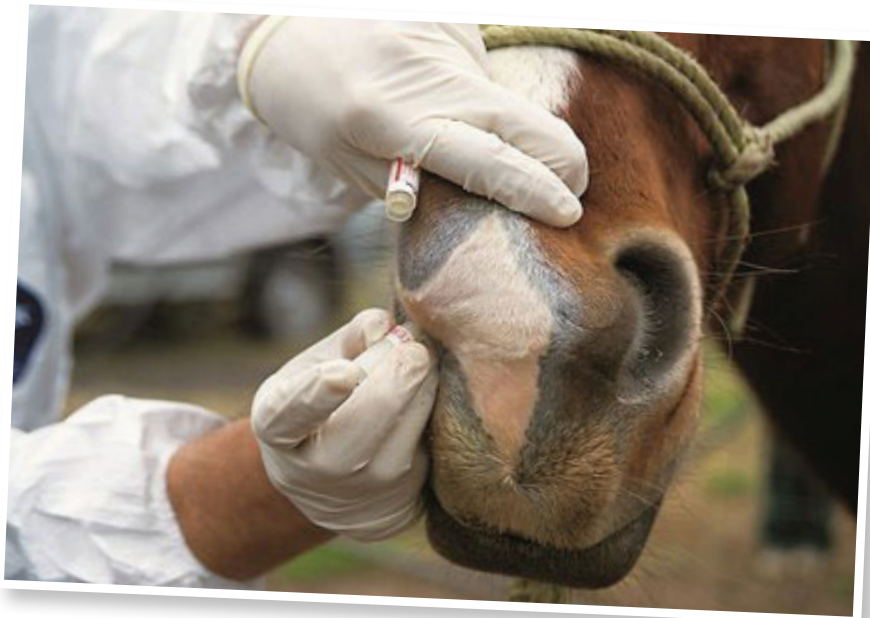
EquiBioSafe is available to download free for all smart phones.

The HBLB Codes of Practice set out voluntary recommendations intended to help breeders and others, with their vets, to prevent and control 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

Hard copy publication of the HBLB Codes has ceased, but they will continue to be available in full on line at www.codes.hblb.org.uk

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



HBLB Veterinary Science and Education Awards: 2017 Applications

Depending on developments covered by Professor Marr in the introduction to this Bulletin, the provisional schedule for the 2017 application round, for awards to start in 2018, is:

Mid March 2017	Announcement of new funding round <i>Research project applications</i> via the Equine Grants System <i>Small project applications</i> using form available on HBLB website <i>Scholarship applications</i> using form available on HBLB website
June/July	Application deadlines
August/September	Review stages
November	VAC meeting to decide funding recommendations
December	Approval of budget by HBLB
January 2018	Announcement of projects and scholarships starting in 2018

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

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