



Horserace Betting Levy Board

HBLB Veterinary Bulletin Autumn 2015



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Do you have an idea that could lead to bigger and better things? If so, read on...

The HBLB's small projects funding gives an opportunity to kick-start fresh thinking and applications are open to anyone based in veterinary practice, veterinary schools and institutes and those working in the racing and breeding industries. The approach must:

- be innovative and progressive;
- be relevant to the breeding, rearing and racing Thoroughbred;
- have robust study design and specific proposals for disseminating the results as widely as possible.

Reports of the small projects commencing in 2015 can be found on Page 5. The maximum length

of a project is 12 months, with an additional period for reporting, and the costs should not generally exceed £10,000.

Examples of the kind of activity that may be supported include:

- efficacy and safety of established or pioneering therapies for conditions affecting Thoroughbreds;
- risk factors for specific injuries;
- tools that will help trainers and breeders to manage their horses more safely and effectively;
- effects of management, nutritional or handling strategies on Thoroughbred behaviour, health and performance;
- novel diagnostic interventions or imaging modalities for early detection and diagnosis of injury;

- biosecurity strategies and other preventive measures to reduce risks of infectious disease on stud farms and training yards.

The next application round will open early in 2016.

For help with developing a bid, why not contact an existing recipient of a small project award, or talk to the Equine Grants Team?

Contact Annie Dodd, Grants Manager: annie.dodd@hblb.org.uk or Laura Barron, Grants Officer: equine.grants@hblb.org.uk

Support for BEVA Congress

HBLB's sponsorship of BEVA Congress has grown and in 2015 we are supporting:

- **On the opening day**, Professor Clutton's plenary lecture;
- **On Thursday 10th September**, the sessions on Refining Lameness and Advances in Orthopaedics;
- **On Friday 11th September**, the sessions on Regenerative Medicine in Orthopaedics and Foals & Youngstock.
- **Throughout Congress**, sessions on clinical research.

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

What is HBLB 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 and re-distribute 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 research scope and priorities for the benefit of the Thoroughbred.

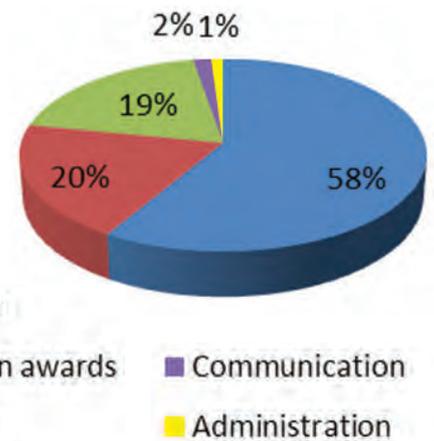
HBLB funding of equine veterinary science and education ensures the availability of the knowledge and skills that are essential to the health and welfare of the horses on which the racing industry ultimately depends.

HBLB Veterinary Expenditure 2015

For 2015, £1.8m was allocated to activities recommended by the VAC (equal to 2014 budget). Following the success of the collaboration in its inaugural year, HBLB will continue managing 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 £2m.

In 2015 work began on

- 6 new research projects (54% of the budget);
- 2 Clinical Scholarships and 1 Research Scholarship;
- 8 small projects.



Who are the members of 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, cardiology</p>
<p>Professor Colin Farquharson BSc PhD <i>Chair of Skeletal Biology, Roslin Institute, University of Edinburgh</i></p>	<p>Primary expertise: endocrinology, 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: Equine sports medicine and science, reproduction</p>
<p>Professor Peter O'Shaughnessy BSc PhD <i>Professor of Reproductive Biology, University of Glasgow</i></p>	<p>Chair of Education Sub-Committee Primary expertise: Reproduction, developmental biology, endocrinology</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>Chair of Thoroughbred Research Consultation Group Primary expertise: Orthopaedic surgery, internal medicine, parasitology</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 the Education Sub-Committee Primary expertise: Rheumatic disease, molecular genetics, molecular and cell biology</p>
<p>Mr Chris Rea BVM&S MRCVS <i>Veterinary practitioner, Three Counties Equine Hospital, Tewkesbury</i></p>	<p>Chair of Codes of Practice Sub-Committee Primary expertise: Lameness, orthopaedics, soft tissue surgery</p>
<p>Professor Falko Steinbach PhD MRCVS <i>Head of Mammalian Virology, Animal Health and Veterinary Laboratories Agency (AHVLA), Surrey</i></p>	<p>Primary expertise: Virology, immunology</p>
<p>Professor Tom Stout MA VetMB PhD MRCVS Dipl ECAR KNMvD <i>Professor of Equine Medicine and Reproduction, Utrecht University, the Netherlands</i></p>	<p>Member of Education Sub-Committee Primary Expertise: Equine medicine, reproduction</p>
<p>Mr Rob van Pelt (to begin term in 2016) <i>Veterinary practitioner, The Arundel Equine Hospital</i></p>	<p>Primary Expertise: Equine medicine, vaccines</p>
<p>Professor Gary Entrican (to begin term in 2016) <i>Principal Research Scientist, Moredun. Honorary Professor, University of Glasgow</i></p>	<p>Primary Expertise: Immunology, internal medicine, reproduction</p>

Research funding

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 single

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 wellbeing 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 the website www.hblb.org.uk.

Research summaries

Summaries of selected completed HBLB-funded research can be seen on racehorsehealth.hblb.org.uk.

Newly posted in 2015:

- *Minimising the risk of fatal and non-fatal injury in jump racing*

Dr Richard Reardon, Mr Anthony Stirk, Prof. Dominic Mellor, Dr Lisa Boden, Dr Richard Newton, Prof. Sandy Love and Dr Tim Parkin – University of Glasgow

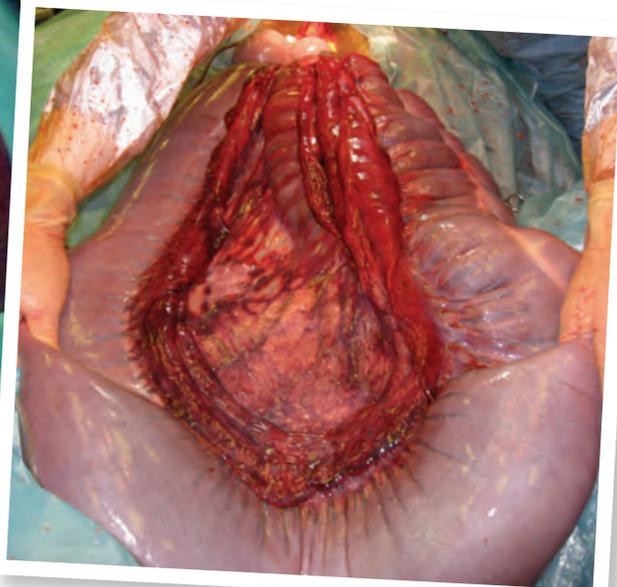
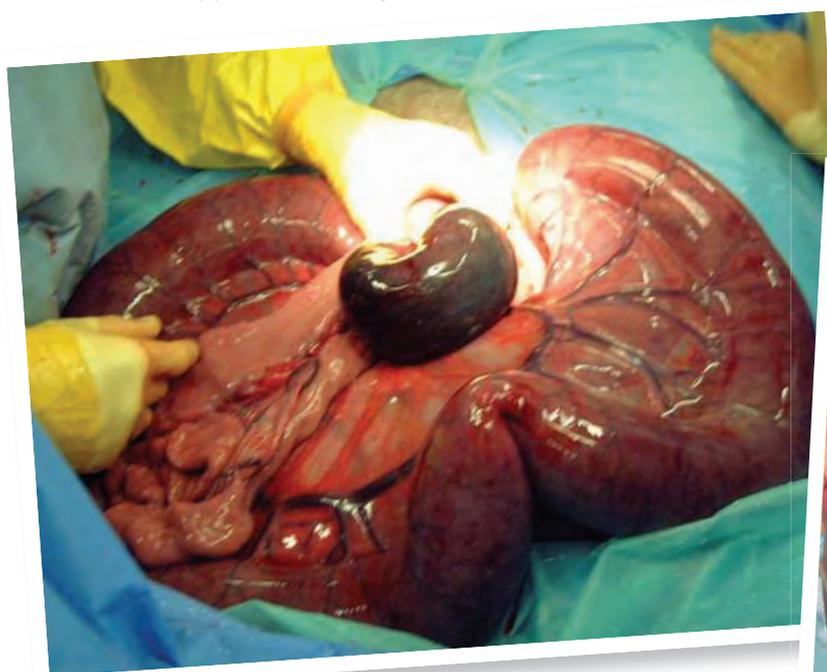
- *A combined engineering and molecular approach to study*

the initiation and progression of equine tendinopathy

Prof Peter Clegg, Dr Hazel Screen, Dr Chavaunne Thorpe, Dr Helen Birch and Dr Graham Riley – University of Liverpool

- *The behaviour of horse Toll-like receptors*

Dr Kate Irvine – University of Cambridge



New research projects starting in 2015

<p>Post natal development of the tendon inter-fascicular matrix for long-term tendon health</p> <p>University of Liverpool Prof Peter Clegg</p> <p><i>Supported by The Racing Foundation</i></p>	<p>Tendon injuries remain one of the most common problems in Thoroughbreds; however, the manner in which tendons function and become injured is poorly understood. Tendons which are particularly prone to injury are highly loaded during use and have to stretch to make locomotion more efficient. The mechanism by which such tendons work to allow stretching and recoil during locomotion has been identified. Tendons develop this specific ability to stretch and recoil after birth, and this specialist property is fully developed by the age of two years. The project will study developing tendons to understand the process by which a key tendon develops its unique properties which are vital for orthopaedic function. The aim is to identify approaches, relating to training or conditioning, which can optimise tendon quality fully to maximise orthopaedic health through life, ultimately reducing the incidence of tendon injuries.</p>
<p>Identification of new vaccine targets for the prevention of <i>Streptococcus equi</i></p> <p>Animal Health Trust Dr Andrew Waller</p>	<p>Using new DNA sequencing techniques to identify genes required by <i>Streptococcus equi</i> in order to cause Strangles, this project will generate invaluable and unprecedented new information on how this bacterium causes disease and identify new targets that can be used to improve Strangles vaccines.</p>
<p>Intrinsic barriers to influenza virus infections in the horse</p> <p>University of Glasgow Dr Pablo Murcia</p>	<p>Equine influenza virus (EIV) is an important pathogen of the horse, posing a constant threat to the equine industry. In the last 51 years, three avian influenza viruses (AIVs) have jumped the species barrier from birds to horses. The interferon (IFN) system is one of the first barriers against viruses that allow people and animals to fight viral infections. Employing modern sequencing technologies and powerful cell culture methods to understand how EIV and AIVs counteract the IFN response, the project will identify genes that are important to block viral infections and that are likely to play an important role against the emergence of novel influenza viruses. The risk of emergence of novel, avian-derived equine viruses will also be assessed. As the IFN response is non-specific, the results will be applicable to other equine viruses, probably leading to novel approaches to treat diverse equine diseases.</p>
<p>Blood outgrowth endothelial cells: a novel non-invasive method for studying equine endothelial cell biology in health and disease</p> <p>Royal Veterinary College Dr Nicola Menzies-Gow</p>	<p>Endothelial cells line every blood vessel and play an important role in maintaining health through regulating blood flow, clotting and inflammation. Alterations in their function are implicated in numerous equine diseases including endotoxaemia, pulmonary inflammation, equine herpesvirus, gastrointestinal disease and laminitis. To date, studying equine endothelial cell function in health and disease has relied on using tissues obtained from euthanased animals, severely limiting the research questions answerable. This project proposes to develop a novel non-invasive method of isolating and culturing equine endothelial cells from the blood, an approach showing promise in human research. If successful, the technique will be used to investigate equine endothelial dysfunction. This methodology will potentially deliver valuable insights into equine endothelial cell biology, facilitating for the first time non-invasive assessment of the effects of disease and direct interventions on the function of these important cells. Furthermore these cells may have diagnostic and therapeutic applications.</p>
<p>Rationally designing bespoke topical delivery systems for equine therapeutics</p> <p>Royal Veterinary College Dr Roger Smith</p> <p><i>Supported by The Racing Foundation</i></p>	<p>The delivery of drugs through equine skin is poorly understood and therefore has been mainly limited to application of cooling agents and topical anti-inflammatories. This unique collaboration will exploit emerging state-of-the-art strategies from human medicine to develop scientifically-based drug delivery systems. However, equine skin is structurally different from human skin and therefore the first phase of the project will explore the fundamental barrier properties of horse skin by measuring diffusion of commonly used drugs into and through the skin. These results will then build a database of the relationship between drug properties (molecular size, solubility, and lipid nature) and their delivery as has been used successfully in developing formulations for human skin. These data will highlight challenging molecules for the second phase of the project, where we will apply novel methods of enhancing drug delivery to and through the skin including penetration enhancers, liposomes, supersaturation and microneedles.</p>
<p>Prediction of antigenic drift in equine influenza viruses</p> <p>Dr Debra Elton Animal Health Trust</p>	<p>Influenza viruses gradually change their surface proteins, enabling them to escape host antibodies induced by previous infections. This process of antigenic drift means that viruses used in vaccines must be updated regularly. The World Organisation for Animal Health (OIE) recommends suitable strains for equine influenza vaccines, which are reviewed annually. It takes 3-4 years for manufacturers to update their products, but there are no predictive methods in place to allow for this delay and changes to recommendations tend to be conservative. To improve selection of vaccine strains, we will combine traditional techniques with new technology to attempt to predict future antigenic changes. Mutations will be made in current OIE viruses to measure their effect on antibody recognition; viruses will also be grown under selective pressure in the presence of horse antibodies to determine which changes occur. Longer term, these methods will be applied to recent viruses to predict future variants.</p>

Racing invests in Thoroughbred health

Professor Celia Marr, who took over as Chair of the VAC on 1st January 2015, said:

“For us, good research has to be both scientifically robust and clearly relevant to the racing and breeding Thoroughbred. Our communications strategy this year will concentrate on making research outcomes available to, and easily understood by, the racing industry, and making promising young researchers aware of the huge range of opportunities in equine science. There is exciting, high quality work going on that is all for the benefit of the 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.

Adding to its sponsorship of a research scholarship at the RVC, including a project investigating the risk factors and pathologies associated with early pregnancy loss in Thoroughbreds, the TBA supported Emily Haggett’s 2014 small project looking at *Lawsonia intracellularis*, a significant threat to foals and youngstock. Emily presented the findings to the TBA’s veterinary seminars in July. For 2015, the TBA is funding a study into whether an examination of the umbilical cord by Doppler ultrasonography during pregnancy can identify abnormalities that may lead to abortion.

The British European Breeders Fund is also continuing its investment in veterinary research, backing the RVC’s work on developing an ethical

welfare friendly method of oestrus suppression.

The Racing Foundation, a fund created from the proceeds of the sale of the Tote, is sharing the costs of two major projects (see opposite) with the HBLB.

Professor Willie Donachie, who retired from the role as Chair of the VAC at the end of December 2014, said:

“It is good news for the future of Thoroughbred health and welfare not only that the HBLB is maintaining the level of its allocation to veterinary science and education, but also that our funding partners, The Racing Foundation, the TBA and the BEBF are continuing to invest in veterinary research. The VAC will again be taking responsibility for managing all the projects, making sure that the funders are kept up to date with progress.”

Small Projects

In the second year of this new category of grant, eight projects are underway. 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 2015 are:

Dr Gayle Hallowell <i>University of Nottingham</i>	Development of a saddle mounted ECG system for documenting fatal dysrhythmias in Thoroughbred racehorses
Dr Alastair Foote <i>Rossdales Equine Hospital</i>	Genetic diversity of <i>Streptococcus zooepidemicus</i> isolated from Thoroughbred horses with inflammatory airway disease, and correlation with clinical and cytological findings
Dr Mandi de Mestre <i>RVC</i> <i>Supported by BEBF</i>	Development of an ethical, welfare friendly method of oestrus suppression in mares
Dr Safia Barakzai <i>Chine House Veterinary Hospital</i>	Investigation of the effect of unilateral laser ventriculocordectomy on exercising respiratory noise in horses with naturally occurring vocal fold collapse
Dr Luis Rubio-Martinez <i>University of Liverpool</i>	<i>In-vitro</i> study of the effects of magnesium sulphate, morphine and mepivacaine on equine joints.
Dr Rita Jabr <i>University of Surrey</i>	Investigation of potential biomarkers for diagnosis of paroxysmal atrial fibrillation in Thoroughbred horses
Dr Thilo Pfau <i>RVC</i>	Improving shock absorption in horses on hard and soft surfaces
Dr Andrew McGladdery <i>Rossdales Equine Hospital</i> <i>Supported by TBA</i>	Assessment of the umbilical cord by Doppler ultrasonography during pregnancy in Thoroughbred mares

Education awards

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

Matthew Robin	University of Liverpool	Equine Internal Medicine and Infection The threat of African Horse Sickness virus in the UK: furthering the understanding of vector biology and how best to protect horses in the event of an outbreak
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

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

Rhiannon Morgan	University of Liverpool	Equine Arthritis Development of sustained release, anti-cytokine siRNA therapy for equine arthritis
Nuria Terron Canedo	University of Glasgow	Oncology/Virology Micro RNAs and equine tumours
Cara Hollowell	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 Coultos	University of Glasgow	Infectious Disease Equine Piroplasmosis – detection and transmission risk

STOP PRESS!!!

In 2015 the HBLB launched a new Equine Post Doctoral Fellowship award which will commence in 2016. The Fellowship, tenable for three years, is open to individuals with a named sponsor at a host institute within Great Britain.

We are looking for exceptional individuals, with a veterinary degree and a PhD, who have 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 rearing.

For further information please contact Annie Dodd, Grants Manager: annie.dodd@hblb.org.uk or 0207 504 4014.



Infectious Disease

In Britain in 2014 there were 10,105 races with 87,531 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 British 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 surveillance, based at the Animal Health Trust in Newmarket.

In 2015, the HBLB will apply some £366,000 (2014: £300,000) to the equine influenza programme and the AHT's infectious disease service, to help protect racehorses and, ultimately, safeguard the racing industry.

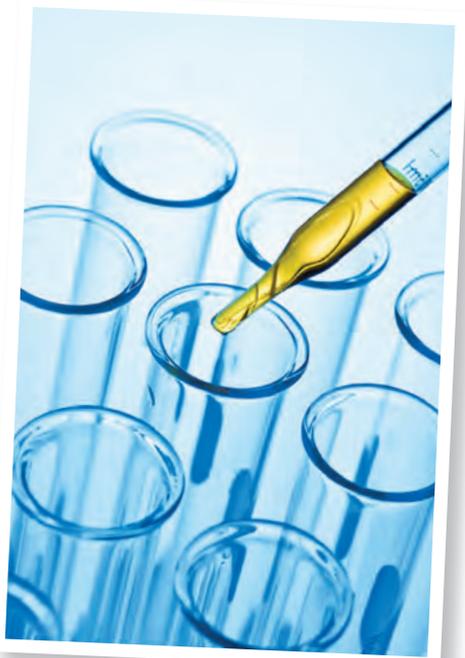
Codes of Practice

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

- Contagious Equine Metritis
- Equine Viral Arteritis
- Equine Herpesvirus
- Equine Coital Exanthema
- Equine Infectious Anaemia
- 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: 2016 Applications

The detailed schedule for the 2016 application round, for awards to start in 2017 will be announced in Spring 2016. As a guide, the following is an approximate timetable covering all grant funding:

Mid March 2016	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	Autumn VAC meeting to decide funding recommendations
December	Approval of budget by HBLB
January 2017	Press Release announcing projects/scholarships starting in 2017

Further information, including grant terms and conditions, is available at www.hblb.org.uk

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