

# Technology Strategy Board

Driving Innovation



## Rapid diagnostics for endemic animal diseases

**COMPETITION FOR COLLABORATIVE R&D FUNDING**

**JANUARY 2013**

**DETECTION & IDENTIFICATION OF INFECTIOUS  
AGENTS INNOVATION PLATFORM**

**SUSTAINABLE AGRICULTURE & FOOD  
INNOVATION PLATFORM**

# Rapid diagnostics for endemic animal diseases

## COMPETITION FOR COLLABORATIVE R&D FUNDING

### Summary

The Technology Strategy Board is to invest up to £2.5m in collaborative R&D projects to develop decentralised rapid diagnostics for the detection of endemic animal diseases and pathogens such as, but not only, liver fluke in livestock, equine herpes virus or white spot disease virus in farmed shrimp.

This competition encourages the development of diagnostic tools for rapid and timely diagnosis and action, such as treatment selection, culling of animals or discarding infected meat and fish, without the need to send samples to high-throughput reference or central laboratories.

The competition's scope allows applicants to consider the business case, including how tests could fit into disease management procedures and the impact of carrying out tests in a decentralised setting.

By 'decentralised', we mean a wide variety of testing scenarios and contexts, including, but not limited to, pen-side and point-of-sampling tests, and those carried out in satellite laboratories, mobile units, abattoirs, dairies, markets, on farms and in fields.

The Department for Environment, Food & Rural Affairs (Defra) and the Biotechnology and Biological Sciences Research Council (BBSRC) are interested in funding this competition; decisions will be made on a project-by-project basis.

Projects must be business-led and collaborative, lasting no more than three years. We are looking primarily to fund industrial research, with a business partner attracting 50% public funding for their project costs (60% for SMEs). We expect projects to range in size from £0.6m to £1.2m, with the maximum total project size being around £1.5m. We may consider larger projects but applicants should discuss this with us before making an application.

The competition is not limited to diagnostic companies. Industries with any relevant capability may join consortia, including

companies with an interest in biosensors, microfluidics, data capture and analysis, design and connectivity.

Where academic partners are involved their costs must be no greater than 50% of the total project costs.

This is a single-stage competition that opens on **21 January 2013**. The deadline for registration is noon on **6 March 2013** and the deadline for submission of proposals is noon on **13 March 2013**.

### Background

The Detection & Identification of Infectious Agents (DIIA) Innovation Platform aims to reduce the economic burden, death and illness due to infectious agents in humans and animals by encouraging the development and adoption of commercially viable diagnostic devices that will create business opportunity and wealth in the UK.

The Sustainable Agriculture & Food (SAF) Innovation Platform was launched in October 2009 to help UK businesses develop innovative technologies, production systems and supply chain solutions that will sustainably increase the productivity of the agri-food sector, while reducing its environmental impact. SAF works closely with DEFRA, the BBSRC and Scottish Government and with these partners it is on target to invest more than £90m by the end of 2014.

The World Bank has estimated that by 2030 world meat production needs to increase by 85% and cereal production by 50% to feed a global population that is expected to rise in that time from 6.7bn currently to 8.3bn. The UK population is forecast to increase from 61m to 70m over the same period.

This competition is highly relevant to the DIIA and SAF innovation platforms because, in combination with other measures, the resulting products

should reduce mortality and morbidity from infectious agents and lead to increased productivity and improved animal welfare.

The Defra Antimicrobial Resistance Co-Ordination Group (DARC) aims to co-ordinate, advise and review Defra activities on antimicrobial usage in animals and antimicrobial resistance in micro-organisms from feeding stuffs, animals and food. The group is chaired by the Veterinary Medicines Directorate and includes the Department of Health, the Health Protection Agency, the Food Standards Agency and other key organisations. The inappropriate and over-use of antimicrobial agents is a concern to the DARC membership; the diagnostic tools emerging from this competition should enable early and accurate diagnosis and appropriate treatment selection.

The Animal Health and Welfare Strategy for Great Britain <http://archive.defra.gov.uk/foodfarm/policy/animalhealth/strategy/ahws.pdf> highlights concerns over resistance to anthelmintic drugs to treat parasites such as gastro-intestinal worms and flukes. Similarly there have been increasing reports of flukicide resistance, particularly to triclabendazole, the drug of choice for acute fluke. Liver fluke disease has been estimated to cost the Scottish livestock industry in excess of £50m annually. Again, readily available reliable diagnostics could play a significant role in treatment selection and disease management.

According to a report published by BCC Research in May 2012, the total world market for animal therapeutics and diagnostics was US \$30bn billion in 2011, up from \$25bn billion in 2008. The report estimates that by 2016 the market is likely to exceed \$42bn, with a five-year compound annual growth rate (CAGR) of 7.2% through to 2016. Diagnostics are a small part of this, with a market of approximately \$2bn in 2011 rising to



\$2.5bn in 2016, but as with human health, diagnostics can play a major role in decision making and impact. The challenges of antimicrobial resistance and the opportunities afforded by stratified medicine are areas being debated by the animal health industries.

This competition follows a number of workshops supported by the Technology Strategy Board with advice from the DIIA and SAF innovation platforms' steering groups and other opinion leaders and experts. Workshops and discussions involved the dairy, beef, sheep, pig, poultry, aquaculture and equine industries along with technology developers, academics, government agencies and organisations such as the British Veterinary Association.

This is one of two competitions in this series and those interested in decentralised rapid diagnostics for human and bovine tuberculosis may wish to look at the other competition here [www.innovateuk.org/competitions](http://www.innovateuk.org/competitions)

## Scope

This competition encourages the development of diagnostic tools for rapid and timely diagnosis and action, such as treatment and culling of animals or discarding infected meat and fish, without the need to send samples to reference or central laboratories.

Diseases of cattle, pigs, sheep, poultry, horses and fish (including shell fish) can be considered. With justification applicants may consider diseases in other animals.

We will be looking for projects that seek to develop diagnostic tests and platforms, or the further development of existing systems, for the rapid detection of endemic animal diseases and pathogens in a decentralised setting

Projects may include work packages to explore the economics of introducing

decentralised tests and the business models around their introduction into current or feasible and acceptable disease management and business practices.

Examples may include, but are not limited to, tests that:

- assess the nature of pathogens (such as viral versus bacterial)
- determine the antimicrobial resistance/sensitivity of pathogens
- guide the use of anthelmintic drugs including flukicides
- identify treatment efficacy
- distinguish between vaccinated and infected animals
- identify the cause and appropriate treatment of mastitis
- identify equine strangles (*Streptococcus equi*), equine influenza, equine viral arteritis or equine herpes virus
- detect *Mycobacterium paratuberculosis* in milk at the point-of-sale
- detect white spot disease virus in farmed shrimp
- detect norovirus contamination in shellfish
- can screen broodstock and egg supplies.

Applicants should note that these examples are part of the output from workshops held in 2012. They have not been verified for their commercial viability. They have been highlighted as unmet needs. A presentation with further details on the output of the workshops can be found on [\\_connect](#).

Go to [www.innovateuk.org/connect](http://www.innovateuk.org/connect) and download them from the DIIA Community Network's documents section under Calls/2013. This site also gives details of the factors to be considered in the development of a rapid diagnostic for use in a decentralised setting. Some, such as cost and the sensitivity and specificity, are the same as for diagnostics in general, but others, such as ease of use and an understanding of how quality assurance, waste disposal and data handling will be achieved need special consideration.

A good understanding of who will carry out the tests, where and when and of the implications is imperative.

The use of any biological sample and non-invasive techniques (for example, the measurement of volatile organic compounds) will be in scope. Living and slaughtered animals and milk can be considered.

The products must generate wealth for the UK economy but we recognise that for some diseases the prevalence will be higher outside the UK and we expect businesses to explore global market opportunities. Organisations outside the UK cannot be consortia members but can be subcontractors.

What is important is to develop devices and tests that are affordable and not overly complex for the setting they need to operate in or for the information required.

The diagnostics should be decision-making tools.

The following are outside the scope of this competition:

- tests for companion animals (although horses are in scope)
- development of central laboratory-based tests and systems
- tests to detect bovine tuberculosis
- detection of infectious agents in processed foods (milk processing in dairies is in scope)
- novel biomarker discovery incorporating, for example, proteomics or approaches that explore the fundamental pathogenesis of disease.

Looking for partners to work on your project? Go to [\\_connect](#) [www.innovateuk.org/connect](http://www.innovateuk.org/connect) and search for DIIA activities under the HealthTech and Medicines Knowledge Transfer Network

## Funding allocation and project details

We have allocated up to £2.5m to fund collaborative R&D projects that are within the scope of this competition.

Projects must be collaborative and can involve science-to-business or business-to-business interactions. Projects must be business-led, so academics can apply only as a partner in a consortium.

The competition is not limited to diagnostic companies. Industries with any relevant capability may join consortia, including companies with an interest in biosensors, microfluidics, data capture and analysis, design and connectivity.

Applicants must establish relationships with appropriate experts, such as veterinarians, farmers, academics, microbiologists and economists to ensure their proposed product is fit for purpose; these experts can be consortia members, sub-contractors or advisers.

Projects can range from fundamental research through industrial research to experimental development (attracting up to 75%, 50% and 25% of total project costs respectively). For this competition we expect most applications to focus on industrial research.

We expect to fund three to five projects but this depends on the size of projects, the final percentage funding and co-funding. Definitions of the above categories of research can be found in the *Guidance for Applicants*. We reserve the right to take a portfolio approach in awarding grants.

## Key dates

Competition opens	<b>21 January 2013</b>
Applicant Briefing day	<b>29 January 2013</b>
Registration deadline	<b>6 March 2013 at noon</b>
Deadline for receipt of applications	<b>13 March 2013 at noon</b>
Applicants informed	<b>26 April 2013</b>

Further information is available in the *Guidance for Applicants* (see the competitions section of our website, [www.innovateuk.org](http://www.innovateuk.org)) and at an optional briefing that will be held in London on **29 January 2013**.

This is a single-stage competition that opens on **21 January 2013**. Applicants must register by noon on **6 March 2013** and full stage applications must be submitted by noon on **13 March 2013**.

**Note that ALL deadlines are at noon**

## Further information

To apply for this competition you must first register with us. You can do this by going to our web page for this competition at [www.innovateuk.org](http://www.innovateuk.org) under Competitions. When you register you will get access to all the supporting information you need to read before you apply, including the *Guidance for Applicants* and the application form

## Competition helpline:

0300 321 4357

## Email:

[competitions@innovateuk.org](mailto:competitions@innovateuk.org)

## Publicity

As part of the application process all applicants are asked to submit a public description of the project. This should adequately describe the project but not disclose any information that may impact on intellectual property, is confidential or commercially sensitive. The titles of successful projects, names of organisations, amounts awarded and the public description will be published once the award is confirmed as final. Information about unsuccessful project applications will remain confidential and will not be made public. E-mail [pressoffice@tsb.gov.uk](mailto:pressoffice@tsb.gov.uk) with any queries.

*The Technology Strategy Board is a business-led executive non-departmental public body, established by the Government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve quality of life.*

*Collaborative research and development is part of the Government's Solutions for Business portfolio.*

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