

Genomes UK: Exploiting the Potential of High-Throughput Sequencing

COMPETITION FOR COLLABORATIVE R&D FUNDING

OCTOBER 2010



Genomes UK: Exploiting the Potential of High-Throughput Sequencing

COMPETITION FOR COLLABORATIVE R&D FUNDING

Summary

The Technology Strategy Board is launching a collaborative R&D competition with up to £5 million available to invest in projects using genomics-based technologies. This initiative seeks to highlight the opportunities created by the decrease in cost and increase in speed in high-throughput sequencing technology. Projects should be business-led and seek to develop new products or processes.

Background and challenge

The UK has a strong history in genomics built on early achievements in sequencing chemistry and technologies. 2010 marks the ten-year anniversary of the release of the draft sequence of the full human genome. This achievement created great excitement surrounding the possibilities for genomics medicine, especially in the area of human health, for the potential to revolutionise the diagnosis, detection and prevention of disease.

Recent developments in DNA sequencing technologies have driven major advances in our understanding of broad areas of biology and biomedicine – from human disease to microbial ecology, plant and animal science to evolution. Over the past few years technological advancements have led to sequencing costs decreasing dramatically, together with an increase in sequencing capacity. These advances have enabled the landmark accomplishments of genomics; the determination of the DNA sequences of major organisms used in life science research.

Genomics is the study of an organism's entire genome aiming at determining and/or fine mapping its DNA sequence. This field of study is underpinned by recent technological developments in the advancement of high-throughput sequencing, microarrays and bio-informatics. The determination of an organism's DNA sequence is the building

block to better understanding of the function, regulation and expression of its genes and, subsequently, its proteins, pathways and processes.

The ability to access genomic information quickly and cheaply provides opportunities for advances in many areas including: increasing our understanding of healthy and diseased states; improving livestock and crop species by selective breeding; developing novel therapeutics, vaccines and antimicrobials; and refining new or existing enzymatic processes. These impact both human and animal health, the sustainable production of food and the identification or production of novel bio-based products.

UK sequencing capacity

There are a number of public and privately operated facilities in the UK that offer high-throughput sequencing services.

The Wellcome Trust Sanger Institute made the largest single contribution to the Human Genome Project. Improvements in sequencing technology mean that the Institute can now produce more DNA sequence in one hour than it did in the 10 years from its founding to the end of 2002.

The Genome Analysis Centre provides national capability for the development and application of sequencing in animals, plants and non-medical microbes, including expertise in bioinformatics. The Centre was launched in 2009 and is funded by the Biotechnology and Biological Sciences Research Council (BBSRC), in partnership with the East of England Development Agency and Norfolk local authorities (Norfolk County Council, South Norfolk District Council, Norwich City Council and the Greater Norwich Development Partnership).

2009 also saw an investment by the Medical Research Council in three new sequencing hubs to further enable researchers to access cutting edge DNA sequencing technology.



Challenge

Although one third of the human genome was sequenced in the UK, no major genomics firms were created from this effort. However, there is still considerable potential for growth in most genomics-using sectors, and the UK is well positioned due to its high-quality science base and significant commercial life sciences sector. The challenge for UK business is to capitalise on the opportunities provided by these technological advances.

Scope

We are seeking to support projects which utilise genomics technologies and techniques, in particular those using high-throughput sequencing for genome analysis, to enable the development of new products and processes.

For example, projects may involve the use of technologies which enable (but are not limited to):

- identification of economically important traits in livestock and crops and the development of tools to exploit this knowledge



- identification of novel biomarkers for screening or diagnostics
- exploration of metagenomic information for application in diverse sectors, including industrial biotechnology and agriculture
- identification and monitoring of infectious outbreaks
- development of novel vaccines and antimicrobials
- genetic improvements in commercially relevant organisms.

While we expect that sequence data will underpin all projects, we envisage that consortia will use a number of 'omics techniques to enable the translation of this information into commercially relevant applications.

Projects that propose sequencing either the full or partial genome of species whose information is not available in the public domain are eligible. Re-sequencing is also eligible, however consortia must demonstrate the additional value that this would provide.

We encourage proposals that involve multi-disciplinary consortia or those proposing applications with cross-sectoral impact. We also encourage consortia that involve an SME that has not previously used genome sequencing within its business.

Exclusions

The development of next generation high-throughput sequencing platforms (hardware) is specifically excluded from this competition.

Projects may involve bioinformatics, including software development. However, those proposing standalone bioinformatics developments are excluded.

Consortia proposing activities which involve the stratification of patient populations should consider applying to the 'Stratified Medicines' competition, which is currently planned for early 2011.

Other application criteria

This initiative is open to all UK-based companies and research organisations, either through business-to-business or science-to-business collaborations.

All proposals must demonstrate:

- requirement for R&D in the area and the value that our investment would bring
- innovation in the proposed solution
- commercial application(s) and the exploitation path for this
- a credible route to market for the technology or process and detail of the market size.

Projects can range from focused basic research aimed at establishing technical feasibility, through to applied research and experimental development projects. We anticipate that most of the funding will be allocated to proposals in the applied R&D (attracting up to 50% funding) or experimental development (up to 25% funding) categories. Projects involving industry-orientated basic research (up to 75% funding) will also be considered, but applicants must make a robust case to support the requested level of funding.

We recognise that added value can be gained through knowledge exchange within and across communities, and we expect consortia to put forward their plans for best practice dissemination and sharing of data and results where appropriate.

Key dates

Competition opens	12 October 2010
Briefing day	22 October 2010
Compulsory Expression of Interest deadline	18 November 2010
EOI applicants informed	3 December 2010
Registration of intent to submit	12 January 2011
Deadline for receipt of full applications	19 January 2011
Decision to applicants	16 February 2011

We are committed to working closely with the research councils to catalyse knowledge transfer between academia and industry, maximising the potential for the outputs of basic research to be commercialised to create economic wealth. Additional funding may be available from BBSRC for industry-led projects with one or more academic partners involved in the development of bioinformatic tools for the exploitation of sequence data. Where BBSRC funds are used for the generation of sequence data, the Council expects consortia to publish this data without delay.

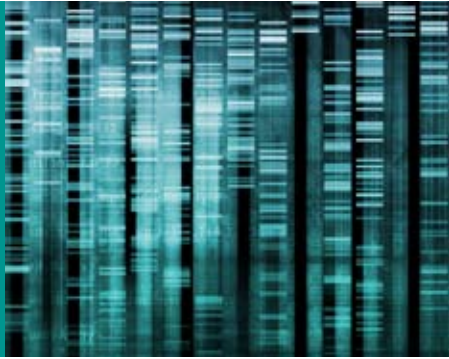
Application process

The application process for this competition is run in two stages:

1. Compulsory Expression of Interest (EOI)
2. Full stage application – by invitation only, subject to recommendation by an independent panel.

Applicants may make an optional EOI prior to their compulsory application. The optional EOI will be reviewed by officials and a response given to applicants within three working days. Applicants may take advantage of this up to one week prior to the compulsory EOI deadline.

A Guidance for Applicants document which explains the competition process in detail is available at www.innovateuk.org under Competitions.



Further information

For more information about this and other competitions, and details of how to register and apply, visit www.innovateuk.org under Competitions.

Competition helpline:
0300 321 4357

Email:
competitions@tsb.gov.uk

Publicity

The Technology Strategy Board frequently publicises the results of competitions and this includes engagement with the media. All applicants will be given a chance during the competition process to opt out of any publicity. Willing applicants will be asked to provide an agreed form of words for use in publicity material. Email 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.

The Technology Strategy Board
North Star House
North Star Avenue
Swindon
SN2 1UE

Telephone: 01793 442700

www.innovateuk.org