

Results of competition: Biomedical Catalyst - Feasibility Studies - Round 5

Total available funding for this competition was £3.2m from the Technology Strategy Board.

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
Bioseptre (UK) Limited	Novel therapeutic antibodies against nf-P2X7	£199,985	£149,985
Project description - provided by applicants			
<p>In December 2013 the World Health Organization, released data showing that globally there were 14.1 million new cases of cancer and 8.2 million cancer deaths in 2012. Significant medical progress has been made, but patient outcomes remain poor, new cancer cases are increasing and for certain types of cancer, existing treatment options and those in development are clearly inadequate.</p> <p>Bioseptre, a company developing cancer therapeutics in the UK, has discovered nf-P2X7, a unique variant of P2X7, an important cell protein present in cancer cells that can be used to target cancers in order to kill them. This project will build on existing data to confirm that it is possible to create an innovative biological therapeutic that can be used to treat patients. Because of its mechanism of action, this therapeutic will have the potential to treat multiple cancer types safely.</p>			

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Biosignatures Limited	Computer enhancement of clinical imaging	£199,659	£149,744
Project description - provided by applicants			
<p>Examination of patients with flexible endoscopes is a very commonly used technique for diagnosing and monitoring diseases. Whilst the widespread use of endoscopy has undoubtedly brought great benefits to medical care, there are still considerable improvements which could be made, for example to the visual quality of images which are examined by clinical staff when making their assessments.</p> <p>This project aims to investigate the potential benefits that computerised image-enhancement and improved video recording could bring to endoscopy examinations with the intention of improving the quality of care that clinical staff are able to provide to their patients.</p>			

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C4X Discovery Limited	Small-molecule agonists of GLP-1R for the treatment of Type-2 diabetes	£197,724	£148,293
Project description - provided by applicants			
<p>Type-2 diabetes has assumed almost epidemic proportions, resulting in a significant financial burden to healthcare systems in developed countries. GLP-1R agonism represents one of the mainstays of therapy for type-2 diabetes, but existing GLP-1 mimetics necessitate injection and have been associated with severe side effects.</p> <p>Through the use of its proprietary NMR-based approach to drug design, C4X Discovery (C4X) has built the first comprehensive pharmacophore GLP-1R agonist 'map' and used this to derive the smallest orthosteric agonist of GLP-1R so far reported. As part of the project, C4X will explore whether this molecule can form the basis of a chemical optimisation programme that will enable the creation of orally-available and cheaper alternatives to existing therapies, thereby providing a significant healthcare benefit in terms of increased patient convenience, improved compliance and reduced economic burden.</p>			

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Cambimune Ltd	Feasibility of site-directed delivery of endolysins for targeted antibacterial therapy	£153,318	£114,989
Project description - provided by applicants			
<p>In light of rapidly emerging bacterial resistance to antibiotics, novel antimicrobials that are more refractory to resistance development are urgently needed.</p> <p>This project will test the feasibility of using targeted delivery of potent and highly specific novel antibiotic compounds. We will evaluate the feasibility of our approach in the context of Clostridium difficile (C.diff). C.diff infections (CDI) are the most frequent hospital-acquired infections in many industrialised countries driven by the emergence of highly virulent, antibiotic -resistant, strains.</p> <p>The disease results when the normal gut flora is disturbed, primarily as a consequence of broad-spectrum antibiotic use, leading to an overgrowth of C. diff. There is a pressing need for a therapeutic regimen that will suppress or remove C.diff without damaging or disrupting the normal bacterial flora of the gut.</p>			

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CellCap Technologies Limited (lead) Lancaster University	A blood test for Alzheimer's disease - diagnosis and monitoring.	£120,283	£105,207
Project description - provided by applicants			
<p>Dementia is a growing problem with 800,000 people affected in the UK alone. Alzheimer's disease is the most common accounting for 62% of cases. Parkinson's disease is the next most common neurological disorder and subsets of this disease also cause dementia as well.</p> <p>At present there is no simple blood test that can accurately diagnose these different diseases and that causes complications in prescribing the correct treatment and also changing treatments quickly as they stop working. Proteins have been measured in cerebro-spinal fluid but collection is painful, can cause problems and cannot be used as a repeat monitoring diagnostic.</p> <p>Our consortium brings together 3 technologies that allows measurement of these proteins in blood and particularly the aggregated forms which are thought to be toxic and cause the nerve damage in the brain. This feasibility study will measure samples from Alzheimer's disease patients and change our understanding of diagnosis of this disease.</p>			

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Cerestim	Feasibility assessment of the opportunity for the use of transcranial cranial stimulation for the treatment of brain disorders	£187,109	£140,332
Project description - provided by applicants			
<p>Neuro 360 is developing the first brain stimulator device for personalized home therapy and rehabilitation. Brain stimulation therapeutics address the needs of approximately 550 million people worldwide with the potential to relieve a burden of \$620 billion on healthcare systems.</p> <p>The company aims to use this Technology Strategy Board grant to identify the best clinical application, develop commercial and IP strategies and conduct a proof of function experiment.</p>			

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Food Dudes Health Limited	Behaviour Change e-Health Platform for Increasing Physical Activity in Children	£198,357	£148,767
Project description - provided by applicants			
<p>The objective of the project is to conduct a feasibility study of developing low cost behaviour change e-health platform for increasing physical activity (PA) in children.</p> <p>As a result of sedentary ways of life, youth obesity has risen dramatically over the past few decades. Effective prevention of overweight and obesity remains a pressing public health priority given the adverse impact on health, quality of life and risk of obesity in adulthood. Current obesity prevention programmes are not evidence-based, limiting their effectiveness, electronic playground equipments are emerging but lack personalisation and interactivity while physical activity measurement devices are rarely designed for children.</p> <p>The objective for Food Dudes is to conduct a feasibility study to evaluate the commercial potential and determine the feasibility of building a prototype of the proposed behaviour change e-health platform.</p>			

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GeneFirst Limited	Improved next generation sequencing to detect ultra-rare, cancer gene mutations in circulating cell-free DNA in blood	£200,000	£150,000
Project description - provided by applicants			
<p>It has been well documented that the release of cell-free DNA into the bloodstream in patients with various types of cancer. There has been growing interest in trying to use such circulating tumour DNA as a non-invasive biomarker to detect the presence of malignancy, follow treatment response, gauge prognosis, or monitor for recurrence.</p> <p>However, current methods have significant limitations. Next Generation Sequencing (NGS) has revolutionised genomic exploration and analysis by making possible simultaneous sequencing of hundreds of billions of base pairs at a fraction of the time and cost of traditional methods.</p> <p>However, the sensitivity of this method is limited by the inherent error rate of the sequencer, as incorrectly read bases might be mistaken for true mutant copies. To overcome this limitation, GeneFirst has developed a method termed Targeted BiDirectional Sequencing technology. This is potentially suitable for detecting rare mutations in circulating cell-free DNA in blood.</p>			

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Highland Biosciences	Demonstrating Feasibility of a Novel Diagnostic for Thrombosis Risk	£199,371	£149,528
Project description - provided by applicants			
<p>This project will demonstrate the feasibility of applying a sophisticated analysis method for the detection of clinically relevant blood clotting defects in patients to an emerging diagnostic sensor platform technology that can be applied to improve outcomes in many high mortality conditions, particularly common amongst the ageing population.</p> <p>Thrombotic disorders are top causes for death, either as disease states – myocardial infarction or ischemic stroke, or as potential complications to most in-hospital treatments, including childbirth and routine surgery.</p> <p>The project will focus on demonstrating clear health benefits and attractive business case through the application of novel diagnostic techniques and will be delivered by Highland Biosciences, a micro SME that leverages a strong network of collaborators proven to deliver successful Technology Strategy Board funded projects.</p>			

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Hypha Discovery Limited	Microbial Enzymatic Drug Modification to Improve Treatment Outcomes	£170,049	£127,537
Project description - provided by applicants			
<p>The major healthcare imperatives are to deliver effective prevention and treatment of diseases. Whilst pharmaceutical intervention of disease progress is effective in many cases, the use of medicines can also lead to adverse reactions resulting in the need for further medical intervention, compounding the cost of therapy.</p> <p>The aim of this project is to further develop a platform product, already used in part by the pharmaceutical industry, to allow the greater exploration of the chemical space of a potential drug to overcome the main cause of adverse reactions, polymorphic variation of cytochrome P450 enzymes (CYPs).</p> <p>Hypha currently uses microbial biotransformations to produce metabolites and effect lead molecule-diversification for Pharma-based clients. The feasibility of a cell-free version of the product will be assessed to target advantages comprising speed of delivery and use in a kit form, enabling Pharma clients to innovatively deliver improved medicines with more predictable properties.</p>			

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Knowledge Economy Developments Limited (lead) Khemeia Consulting Limited	UbiquiSon - Ubiquitous ultrasound; machines within the reach of every clinician, all the time.	£195,747	£146,810
Project description - provided by applicants			
<p>The UbiquiSon project is about realising the enticing prospect of ubiquitous ultrasound - putting ultrasound within the reach of every clinician, all the time. In essence the goal is to produce low-cost, highly portable devices that are capable of generating the high quality images that clinicians need and desire, with significant benefit in a wide range of clinical settings.</p> <p>Four clinical impacts of ubiquitous ultrasound have been identified:</p> <ul style="list-style-type: none"> (1) Faster access to ultrasound; (2) Broader access to ultrasound; (3) Reduced clinical risk and (4) Change in clinical behaviour. <p>The expectation is that this will lead to both improved patient care and substantial healthcare efficiency improvements. The cost of these innovative ultrasound machines will be low enough to make their purchases part of discretionary spend. The proprietary Smart US technology is what makes this leap feasible.</p>			

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Medical Wireless Sensing Limited (lead) Kings College London	Non-invasive glucose monitoring using high-frequency radio waves	£199,806	£170,130
Project description - provided by applicants			
<p>We are developing the first accurate, non-invasive, wireless glucose monitoring system. The system consists of a wearable on-ear sensor, a mobile unit for receiving and displaying the glucose data, and a cloud-based software platform which interfaces with existing electronic health systems to store and provide data access to patients, carers or medical professionals.</p> <p>We will combine these systems onto a single IT and smartphone platform so that users have access to all the information they need to maintain effective control of their blood glucose levels and health care professionals can accurately monitor their treatment adherence. The main objectives of this system are to provide a pain-free, cheaper and more hygienic option to the current blood glucose monitors, while at the same time providing the user with the additional tools they need to effectively manage their condition.</p>			

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Mission Therapeutics	Feasibility of inhibiting desumoylating enzymes for treating platinum-resistant cancers	£199,493	£149,620
Project description - provided by applicants			
<p>Through work funded by the Technology Strategy Board, Mission Therapeutics identified SENP enzymes as new therapeutic targets for treating drug-resistant ovarian cancer. For drug discovery, SENPs pose a distinct challenge as they require specific substrates and assays and they are not well studied in terms of their biological role(s). For these reasons, SENPS are currently considered higher risk targets.</p> <p>We propose to use our proven expertise targeting related enzymes to test the feasibility of developing SENP inhibitors by developing appropriate biochemical and cell-based activity assays then screening a bespoke compound library to assess druggability. In addition, we will carry out additional target validation to further assess the utility of inhibiting SENPs for treating drug-resistant cancers.</p>			

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Orphidia Limited	HAITI-POC - High Accuracy Immunoassay Test at Point-of-Care	£183,712	£137,784
Project description - provided by applicants			
<p>Biomarker assays offer robust and accurate diagnosis for some conditions but cannot be performed at the point-of-care, increasing costs to the system and inconvenience for patients. In addition, current technologies are not well-suited to the complex, multi-factor analysis needed by the next generation of assays.</p> <p>Orphidia proposes a ground-breaking technology that brings lab-quality tests to the point-of-care and maintains accuracy for complex tests. Orphidia will transform the process of biomarker development, significantly accelerating the uptake of new assays and increasing profitability and investment in the sector.</p> <p>In this project we will validate the accuracy of tests run on Orphidia's chip, confirm clinical specifications for the product and refine the commercial proposition of the system. Successful delivery will allow us to move forward with completion of the full Orphidia system, in order to enter the market one year after project-end and enable faster, better treatment for patients.</p>			

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PharmacoGenomic Innovative Solutions Limited	Novel Drug Targets for Treating Rheumatoid Arthritis based on Analysis of Human Genetic Data	£81,126	£60,844
Project description - provided by applicants			
<p>Rheumatoid arthritis is a disabling and painful condition that can cause substantial reduction in quality of life to patients, and is associated with early death and significant socioeconomic costs. Despite recent progress in treating the disease, there are several areas of unmet need, including addressing treatment failures or partial response.</p> <p>In this project, a novel mathematical method for analysing genetic data will be applied to a dataset generated from patients with rheumatoid arthritis. We are confident that the analysis will identify significantly more genes associated with the disease than conventional methods. This list of genes will provide an excellent basis for identifying new drug targets to treat this disease. As these drug targets are derived from analysis of human genetic information, they are more likely to be relevant to the human disease, and therefore will have a greater probability of success in clinical development.</p>			

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Plasticell Limited	Optimisation of human iPS cell-derived platelet manufacture	£199,728	£149,796
Project description - provided by applicants			
<p>Platelets are an essential component of blood, involved in homeostasis, clotting and wound healing. Certain medical treatments (esp. chemotherapy) cause a severe reduction in platelet count leading to uncontrolled bleeding. This can be treated with transfusions of platelets isolated from donor blood, but in approximately 15% of patients, repeated challenge with platelets from other donors causes an immune response, leading to 'alloimmune platelet refractoriness' which is costly to treat and life threatening.</p> <p>We have developed a method of producing platelets from stem cells (which can be made from the patient's own cells) and wish to develop this as therapy for low platelet count due to alloimmune refractoriness. This project is to scope the feasibility of upscaling the manufacturing process and reduce costs by up to 500-fold through process optimisation and use of proprietary small molecules that specifically modulate hematopoiesis and improve efficiency.</p>			

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Polyphotonix Limited (lead) The Centre for Process Innovation	the manufacture of a flexible blanket that will provide phototherapy treatment for a number of conditions (BAMBOO)	£200,000	£165,000
Project description - provided by applicants			
<p>Project BAMBOO will develop a wearable and flexible phototherapy device for the treatment of a number of medical conditions including but not limited to wound healing, neonatal hyperbilirubinemia or Psoriasis.</p> <p>The device will be produced by printing methods it will incorporate sensors to allow the measurement of disease progression, monitor infection and manage dosage.</p>			

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ProteinLogic Limited (lead) Institute of Hepatology	Technical and Commercial Feasibility of a blood test for prediction of response to interferon treatment in Chronic Hepatitis B patients	£166,919	£127,564
Project description - provided by applicants			
<p>Hepatitis B is the most common chronic viral disease in the world with over 350 million chronic carriers. Taking into account the recent migration patterns it is estimated that that there are now more than 300,000 people in the UK with HBV infection and, of these, 78,000 have Chronic Hepatitis B infection.</p> <p>NICE recommends that interferon be used as the first line treatment for Chronic Hepatitis B. However interferon treatment has a long duration (6-12 months), considerable side effects including fever, neurological and gastrointestinal disorders and whilst it can be very effective only 30% of patients respond to treatment.</p> <p>ProteinLogic has identified biomarkers that can be used as a simple diagnostic blood test for the prediction of response to treatment with interferon in patients with chronic HBV infection before start of treatment, therefore providing significant benefits to patients and saving healthcare costs in the UK and worldwide.</p>			

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Tecrea Limited (lead) University of Leeds	Modulating intracellular oncology targets using Adhiron TM – a novel therapeutic approach	£198,393	£173,460
Project description - provided by applicants			
<p>Tecrea and Leeds University BioScreening Technology group will collaborate to establish the feasibility of using peptide aptamers based on the Leeds's Andiron platform to modulate intracellular oncology targets. In particular KRas and Bcl-xL.</p> <p>The key innovations are the use of Tecrea's safe nanoparticle based delivery system combined with a stable peptide aptamer platform to provide a new modality for target modulation and future therapy.</p>			

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Vasgen Ltd (lead) UCL Institute of Ophthalmology	Evaluating Novel Monoclonal Antibodies to Target ADAM15 for a Potential Novel Ocular Anti-Angiogenesis Therapy	£199,996	£173,434
Project description - provided by applicants			
<p>Eye diseases, characterised by the dysregulated growth of leaky blood vessels in the retina, are debilitating conditions that effect up to 800,000 people in the UK, particularly the elderly. In recent years, drugs which block the action of a molecule called VEGF have been developed and have transformed the management of these diseases by preventing the growth and leakiness of the blood vessels.</p> <p>Patients now not only maintain their vision, a third may even gain back a substantial portion of the vision lost prior to treatment. However, a third of patients do not gain vision and up to two thirds could experience better results for reasons partly due to the aggressiveness of their disease and partly related to genetic predisposition. Therefore, new therapies that can complement the action of existing drugs are urgently needed.</p> <p>The funding provided for this project will assess the feasibility of a developing a new therapy and evaluate the potential for a drug combination with VEGF blockers.</p>			

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Xention Limited	Development of a translational model system of the spinal pain synapse	£193,060	£144,795
Project description - provided by applicants			
<p>The discovery of new drugs has become an extremely costly and time-consuming activity, and is associated with many late-stage failures. After 30 years of research there still remains a large unmet need for safe and effective treatments for chronic pain. One of the reasons for so many clinical failures, especially in the area of pain drug discovery, is the difficulty in predicting whether a potential drug will work in man.</p> <p>In order to address this problem we intend to develop a new technique that will allow the detailed evaluation of new drugs in a model pain system and so bridge the gap between traditional and well characterised but simple primary testing assays and more complex whole animal behavioural models.</p> <p>Success in this project will allow us to prioritise new pain drugs for testing in animal models, reducing the unnecessary use of animals as well as accelerating the drug discovery process and improving the chances of achieving success in man.</p>			

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XstalBio Limited	Tablet Vaccines	£190,584	£142,938
Project description - provided by applicants			
<p>Acellular vaccines have an excellent record of safety and efficacy in target paediatric patients but the restricted scope of the immune response and the reduced duration of immunity compared to previous live or attenuated vaccines has led to declining protection for older patients and incomplete herd immunity.</p> <p>For pertussis this has resulted in a recent upsurge of cases across well vaccinated countries. The objective of this project will be to develop innovative tablet vaccine formulations to allow booster acellular vaccines to be taken orally. The formulations will aim to boost systemic antibody titres and induce a mucosal immune response resulting in improved efficacy.</p> <p>Self-administered oral booster vaccines will also lower healthcare costs and encourage better patient compliance, resulting in more extensive community protection within developed and developing world countries.</p>			

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Zilico Limited	Electrical Impedance Spectroscopy to detect neoplastic oral lesions	£136,924	£102,692
Project description - provided by applicants			
<p>When found at early stages of development, oral cancers have an 80 - 90 % survival rate. Unfortunately, the majority are found as late stage cancers. This accounts for the very high death rate of ~43% at five years from diagnosis, for all stages combined at time of diagnosis.</p> <p>Zilico Ltd is developing the next generation of cancer diagnostics and proposes to use electrical impedance spectroscopy as a tool to diagnose the presence of oral cancer.</p>			