Results of Competition: Biomedical Catalyst 2020: Round 1, Early and Late Stage Awards

Competition Code: 2007_CRD_ASHN_BMC_2020

Total available funding is £30,000,000

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
ALCHEMAB THERAPEUTICS LTD	Novel protective 'self'-antibodies for disease modification in Huntington's Disease	£1,426,790	£998,753
MEDICINES DISCOVERY CATAPULT LIMITED		£150,100	£150,100

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Funders Panel Date: 11/01/2021

Project description - provided by applicants
Alchemab Therapeutics has a new way of approaching drug discovery by focussing on what keeps people well, sometimes against the odds. All of us produce a vast repertoire of different antibodies as part of our usual immune responses to fend off pathogens and to help the body maintain its health status. We believe that some individuals are able to use this mechanism to protect themselves against diseases to which they are pre-disposed. Huntington's disease (HD) is a devastating neurodegenerative disease, without any current medicines to slow or stop its progress. It has a genetic cause that is screened for in members of HD high-risk families. Surprisingly, some rare individuals with known genetic HD risk factors have far out-lived the age at which they would be expected to develop clear symptoms, and the underlying reason is not fully understood. Alchemab analysed B cells (which produce antibodies) of some of these resilient patients and identified antibodies common to those individuals resisting disease and not present in those patients who are showing symptoms. This grant will fund work to determine what the molecular target of these antibodies is (what they bind to), and whether they can protect against pathological mechanisms of HD. Our aim is to develop and test these antibodies as therapies to help other individuals living with a HD diagnosis that may not have been so lucky as to develop a protective antibody response themselves, which could be transformative in slowing the course of the disease. To do this, we intend to work with UK experts in complex cellular models of neurodegeneration, including those at the Medicines Discovery Catapult. Accessing human brain cells for neurodegeneration research is difficult, and so methods have been developed to reprogramme, in the lab, cells taken from skin into the cell types found in the brain. This can also be done with cells taken from Huntington's disease patients. We will use these human cell-based systems to find out how our antibodies change the biology that is different between healthy and HD. By using these cells for our studies, we are able to stay as close to the human biology of patients which led us to the discovery of these antibody candidates as possible, and this may give us a better chance of success in clinical trials. We hope this will help us to bring much needed therapies to Huntington's Disease patients faster than traditional drug discovery.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
VHSQUARED LIMITED	Pre-clinical development of an innovative, bi-specific , oral biologic for the optimal treatment of IBD	£2,725,747	£1,908,023

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Project description - provided by applicants
Inflammatory bowel disease (IBD) includes chronic disorders that cause inflammation of the gastrointestinal tract. In 2017 there were approximately 6.8 million patients globally with IBD, primarily either Crohn's disease or Ulcerative Colitis. In the UK, the prevalence of Crohn's disease in 2016 was 414 per 100,000 and the prevalence of Ulcerative colitis was 640 per 100,000\. The prevalence continues to increase around the world. The aim of this project is to obtain the pre-clinical data required to submit an application for regulatory authorization to carry out human clinical trials of a new biologic therapy for the treatment of IBD. This innovative product combines orally delivered antagonism of two distinct, clinically validated targets to achieve a greater degree of efficacy, for a longer duration, and in a higher proportion of patients than inhibition of a single pathway alone is able to deliver, and at a cost that overcomes current barriers for wider access. Current therapies aim to induce and maintain remission; Tumour necrosis factor (TNF?)-neutralising antibodies have been shown to be effective in moderate-to-severe IBD and this class of medication is currently the most effective treatment available. However, in addition to the high cost that limits their use to those with later stage disease, approximately one-third of patients are primary non-responders. In responders, a subsequent loss of response is reported in 10-50% of patients per year (secondary non-response). As a result, only 19 % of patients with Crohn's disease and 6% with Ulcerative colitis currently receive biological therapy and fewer than half of these patients persist after 1 year. Therefore, the potential number of users for effective orally delivered domain antibodies that address these shortcomings runs into millions globally and many thousands in UK. By blocking a second pathway along with TNF?, and in a single molecule formulated for oral delivery, this project will address the unmet need by: *Increasing efficacy by improving the primary response rate and decreasing loss of response over time *Providing oral delivery for greater convenience and compliance *Increasing safety achieved by oral delivery: providing localized anti-inflammatory activity in the gut, avoiding systemic exposure and associated whole body immunosuppression and injection site reactions *Reduced price to healthcare system/payors compared to two co-formulated molecules, or two combined systemically administered antibodies *Oral delivery is a tolerogenic route for antigen presentation and the domain antibodies have very low immunogenicity, together reducing the loss of response due to anti-drug antibodies.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
GREY WOLF THERAPEUTICS LIMITED	Accelerating and expanding the therapeutic potential of ERAP1 inhibition in cancer	£762,054	£533,438
University of Oxford		£199,530	£199,530
University of Southampton		£134,837	£134,837

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Grey Wolf Therapeutics is developing a next-generation approach to cancer immunotherapy that is more effective than existing treatments and can be applied to a much wider variety of cancers. Breakthroughs in immunotherapy have been ground-breaking in the treatment of some cancers, with great benefits in some patients with advanced disease, in some cases extending and improving the life of patients by many years. However, most types of cancer are not controlled by these therapies, and therefore there remains a huge need to develop new medicines as cancer rates continue to grow. Recent research has shown that the visibility of a tumour to the immune system is one of the most important factors that decides whether it will progress and grow. Tumours that show a high number of 'non-self' components at the cell surface called neoantigens are particularly sensitive to current immunotherapies because they are more visible and likely to be recognized by the immune system as 'foreign'. However, most cancers have low numbers of neoantigens on their surface and therefore immunotherapies are not very effective in these cases. The immune system simply doesn't recognise that the cells should be eliminated. The future of cancer therapy requires new medicines that can address the tumour visibility problem. Grey Wolf has developed an innovate medicine that significantly alters the neoantigens presented on the cancer cell surface, illuminating them to the immune system, which is now able to recognise that the cells should be destroyed. This completely novel mode of action is active across the spectrum of cancer types and as such has the potential to provide huge benefits to thousands of cancer patients who currently have no effective treatment options available to them.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BICYCLE TX LIMITED	Development of a novel class antibiotic for therapy of carbapenem-resistant Enterobacteriaceae	£3,898,406	£2,339,044

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Project description - provided by applicants

The COVID-19 pandemic illustrates the need for future preparedness to tackle emerging infectious diseases. Whilst \>1 million people worldwide have died from COVID, antibiotic-resistant bacterial infections kill 700,000 people every year. COVID-19 has also exacerbated the AMR crisis by increasing use of broad-spectrum antibiotics, and also creating a reservoir of hospitalised patients, many ventilated, who are at severe risk from multi-drug resistant bacterial infections.

Antibiotics which have been developed in recent years are mostly incremental improvements on existing classes, sharing common liabilities to resistance mechanisms. For the most difficult to treat infections caused by Gram-negative bacteria, there has been no new class of antibiotic introduced since the 1970s.

Our vision is to develop the first new class antibiotic for therapy of Enterobacteriaceae, the most clinically-prevalent class of Gram-negative bacterial pathogens, for 50 years and to establish Bicycles as a new therapeutic modality for infectious diseases.

Under SBRI funding, we have applied Bicycle's proprietary bicyclic peptide (_Bicycle_(r)) technology, to develop strong leads which inhibit penicillin binding protein 3 (PBP3), part of the bacterial cell wall biosynthetic apparatus and a key target of the beta-lactam antibiotics., Our agents are of a totally new antibiotic class, and so have key differentiators:

1\. Our compounds are not inactivated by beta-lactamase enzymes which inactivate the most widely used antibiotic class, the beta-lactams, and do not show cross-resistance with existing classes of antibiotics

2\. Our compounds enter bacteria using a novel mechanism and are not expected to exhibit reduced uptake due to a loss of outer membrane porins or upregulation of efflux pumps

We have already developed a potent inhibitor of PBP3 which has promising antibacterial potency and spectrum of activity across Enterobacteriaceae. Our crystallographic work on the bound lead shows exquisite interactions with the enzyme active site across a broad binding surface and we have improved entry of our 'warhead' molecule into Gram-negative bacteria by conjugation to a cationic peptide ('vector'). .

The goal of this application is to develop a drug candidate ready to enter a phase I clinical trial. Key objectives are:

increase antibacterial potency by improving the 'warhead' target affinity and the efficiency of the 'vector' peptide

improve pharmacokinetics to optimise _in vivo_ efficacy

investigate resistance prognosis and identify possible mechanisms of resistance

perform formal GLP safety testing to identify a safe dose to initiate clinical testing, identify potential toxic mechanisms and provide a data package to support

a clinical trial application

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
CHROMITION LIMITED	Digital Breast Cancer Histopathology Screening Tool	£956,098	£669,269

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Project description - provided by applicants
Chromition's 'Digital Histopathology Screening Platform' (DHSP) will transform the way cancer is diagnosed in tissue biopsies taken from patients. The DHSP will enable the autonomous, rapid, economical diagnosis of cancer in tissue and provide a more detailed picture of disease status and enable stratification of patients for physicians to provide personalised and more effective treatments. Chromition's DHSP can be used to diagnose many types of cancer in tissue and this project will validate the DHSP to diagnose breast cancer and identify the optimal treatment for improved patient outcome.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
ARECOR LIMITED	Transforming Diabetes Care	£3,999,380	£2,799,566

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Project description - provided by applicants
AT247, a novel formulation of insulin with an ultra-rapid glucose lowering action, can transform diabetes care by enabling the development of a fully closed loop artificial pancreas (AP) system. The AT247 formulation was developed using Arecor's proprietary formulation technology and is based on a unique mixture of two ingredients. The first results in significant acceleration of insulin absorption from the injection site and the second ensures excellent stability of insulin in the pump. The ultra-rapid action of AT247 has already been demonstrated in a Phase I clinical trial where the onset and offset of exposure was superior to that of Fiasp, currently the fastest acting, commercially available insulin. The objective of the proposed Phase II trial is to compare the glycaemic control, safety and tolerability of AT247 with Fiasp when administered by insulin pump over a period of 6 weeks. Continuous glucose monitoring will allow the assessment of time spent with blood glucose (BG) level in a healthy range (TIR), a key metric for measuring episodes of hyper- and hypo- glycaemia as well as influencing long term health outcomes for people with Type I diabetes (T1D). Despite significant advances in treatment options, only 6% of people with T1D are considered to be under good BG control. It has been shown that TIR is significantly improved when patients are using an automated insulin delivery system (AP), where BG is continuously measured, an algorithm calculates insulin requirements based on real-time BG which is then automatically delivered by a pump. Current best-in-class insulins are not fast enough acting to control BG within an AP system around meal-times (when BG rises rapidly) and the patient must manually intervene (hybrid closed loop, HCL). The challenge is to develop an ultra-rapid acting insulin that enables a fully closed loop AP system. This will be transformative for T1D patients, improving quality of life and health outcomes. In addition, a true AP system will ultimately greatly reduce the wider burden of T1D on health care systems.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
RINRI THERAPEUTICS LIMITED	Preclinical development of a first in class stem cell therapy for hearing loss	£2,312,468	£1,618,728
CELL THERAPY CATAPULT LIMITED		£1,028,557	£1,028,557

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Over 400m people have disabling hearing loss in the world, with this figure expected to nearly double by 2050\. Deafness has a devastating effect on people, significantly affecting quality of life, education and employment prospects. The direct and indirect costs of hearing loss are estimated at £30B a year for the UK alone due to direct costs of life long treatment, personal costs to mental health, and lost economic productivity. There are no drugs for patients with hearing loss, the only treatments options available are medical devices such as hearing aids and cochlear implants. These devices only work for some patients and don't fully restore hearing for them. For patients with damage to the nerve cells of the ear (40m people globally), there are no treatments. Hearing devices do not work and these patients have no options. Patients and doctors have been demanding drugs that cure the underlying causes of all hearing loss conditions but particularly hearing caused by nerve damage, and this is the issue that Rinri Therapeutics was created to address. Rinri's approach is to repair the damage in the ear that causes hearing loss by replacing the damaged cells with ones that work. To do this, we are developing a unique cell-based therapy for patients with hearing loss caused by nerve damage. These cells will be injected near to the site of damage in the ear where they will grow. These new cells are then able to restore the broken connections in the inner ear. Once hearing is restored, the patient will be able to communicate properly and fully participate in society, engaging socially and economically without restriction. Currently, Rinri has shown that the therapy works and is safe in models of the disease and has shown that it can be made to high quality for patients. In this project, Rinri wants to complete its manufacturing development so it can produce clinical-grade cells, complete the background datasets, and develop the approach to deliver the product to patients. These project objectives will accelerate the pre-clinical development of Rincell-1 to demonstrate the safety, efficacy and manufacturability profile required by regulators for first in human clinical trials to demonstrate proof that the therapy works in humans and attract the funding required to take us through the remaining clinical program to the market.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
NOVAI LTD	Development of a novel ophthalmic biomarker	£1,637,233	£1,146,063

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Novai Ltd is developing a highly sensitive diagnostic tool for ophthalmic diseases allowing very early diagnosis, disease monitoring and patient stratification. The solution has already demonstrated powerful prognostic capability, accurately predicting the degree of disease progression in a cohort of glaucoma patients in Phase 1 and Phase 2 clinical trials (PMID:32310684), and initial findings were published in 2020\. This project focuses on the advance of this ophthalmic biomarker with added functionality and a formulation compatible with outpatient delivery, to enable very early diagnosis of sight-threatening diseases, and earlier therapeutic intervention.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
OXFORD HEARTBEAT LTD	PreSize medical device software that allows pre-operative rehearsals of stenting surgeries to reduce complications	£2,207,954	£1,545,568

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Project description - provided by applicants
Our goal is to make cardiovascular surgeries more efficient and safe. This project develops the PreSize platform, a novel clinical decision-support solution that helps clinicians plan and rehearse stent placements inside blood vessels. Using cutting-edge computational modelling, we make the best use of available patient scans and stent device mechanics to accurately predict the behaviour of devices inside each patient's vessel configuration. This allows clinicians to optimise device selection, reducing the number of complications and the associated cost of stenting surgeries for hospitals and our society. We are a start-up company specifically created to bring this technology to hospitals. We currently run IUK Biomedical Catalyst Primer (BMC-P) project, and are incubated by The Royal Academy of Engineering. The results of our previous projects have received numerous awards, including the NHS Innovation Award 2017 from Health Enterprise East (HEE). We were named the "Best Healthcare Start-up of 2018" by WIRED magazine and were the national winner at the prestigious Medilink UK Healthcare Business Awards 2017\. We were selected to be part of the Digital Health London Accelerator (DHLA) programme, and previously one of the 6 startups selected globally by Philips Healthcare Accelerator, as well as featured in two Forbes articles as "founders striving to change the world" and "one of the new British start-ups to watch closely", two WIRED articles: "These are the healthcare start-ups you need to know about" and "From AI doctors to 3D X-rays, the future of healthcare is already here", and have been featured in The Times, Financial Times, etc. Our aim is to grow Oxford Heartbeat to be the leading provider of clinical decision support tools, to improve healthcare and define the medicine of tomorrow.

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CAMBRIDGE ALLERGY LTD	CA002 peanut allergy immunotherapy readiness for Phase 3 clinical trials in children	£1,599,258	£1,119,481

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Project description - provided by applicants
Peanut allergy is the most common cause of severe reactions and food allergy deaths in children and adults. The continuous need to manage these risks profoundly reduces quality of life of allergy sufferers and their families. Camallergy is pioneering a novel biological oral immunotherapy drug CA002 for the treatment of peanut allergy to protect patients from severe reactions should they accidentally eat food containing peanut. It aims to provide protection within 12 weeks of starting treatment significantly improving quality of life. The treatment regime desensitises patients by gradual exposure to increasing amounts of characterised allergenic proteins and involves seven short treatment visits and two years of easy, daily administration. The early access programme at Cambridge Peanut Allergy Clinic has achieved \>95% success in over 200 children. This project will bring CA002 treatment closer to large-scale and international commercialisation. It includes all pre-trial work required to gain approval to initiate global clinical trials that aim to confirm the success of CA002 at Cambridge Peanut Allergy Clinic. Camallergy's primary customers are allergy physicians (around 4,500 in US, 12,000 in Europe). Peanut allergy represents a potential £multi-billion market with a critical unmet need. Approximately 6m people in the EU and US have a peanut allergy, including 3m children. Based on feedback from international key opinion leaders and our experience at the Cambridge Peanut Allergy Clinic, we anticipate strong demand for safe, efficacious, patient-centric treatments.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MR COILTECH LIMITED	Development of a Novel Head Coil for Clinical Neuroimaging in 7 Tesla MRI Scanners	£247,900	£173,530
NHS Greater Glasgow and Clyde		£44,809	£44,809
University of Glasgow		£275,098	£275,098
WIDEBLUE LIMITED		£95,802	£67,061

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Project description - provided by applicants
Magnetic resonance imaging (**MRI**) is a powerful tool for diagnosing medical conditions that affect the brain. Standard MRI scanners in current use have a magnetic-field strength of 1.5 tesla (1.5T) or 3 tesla (3T). Recent advances have led to scanners with a magnetic-field strength of 7 tesla (7T), which provide images with an increased level of detail. These systems now have approval for medical use in Europe and the USA. This project concerns the commercial development of new technology that will enhance the performance of these new 7T scanners. Neurological conditions, including brain tumours, epilepsy, multiple sclerosis, motor neurone and vascular disease will significantly benefit from the introduction of 7T MRI. This promises to improve diagnosis and help clinicians to deliver more targeted, personalised and effective treatments. Despite this potential, the introduction of 7T MRI into clinical use has been impeded by the difficulty to acquire uniform images of a large area of anatomy, such as the whole brain. This is a fundamental limitation caused by the shorter radiofrequency wavelength at 7T. Parallel transmit (pTx) technology provides the means to overcome this problem and produce uniform images. The project is based on an existing research project at the University of Glasgow, which has resulted in the development of a prototype of a novel head coil for MRI of the brain at 7T. The new coil incorporates pTx technology, which improves image uniformity and offers better visualisation of brain regions that are important in the management of epilepsy, MS and vascular disease. Furthermore, an open-face design improves patient comfort and minimises claustrophobia. The compact design is operator friendly and saves space on the patient table. Modern 7T MRI scanners operate in two modes: a technologically advanced pTx mode, and a conventional single-transmit (sTx) mode. The new coil is designed to be used in both modes, whereas separate coils are currently required. This dual-mode feature prevents the need for two coils, which is a considerable cost saving to the consumer and is time-efficient. Our goal is to translate the prototype head coil into a medical device suitable for clinical diagnostic use. The first stage in this process is to develop the new head coil through ISO 13485 quality management systems and achieve corresponding certification. This project will demonstrate performance and safety of the device using computer modelling, phantom studies and healthy volunteer imaging to prepare for subsequent evaluation in a clinical setting.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BRAINWAVEBANK LTD.	Cumulus NeuroScience: Real-World Technology to Accelerate Clinical Trials in Dementia	£2,623,685	£1,836,580

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
It is estimated that more than one million people in the UK will have dementia by 2025, with one in three born in 2015 projected to develop it in their lifetimes (ARUK, www.dementiastatistics.org). Clinical trials in this field are typically long, drug development costs are extremely high, and success rates for development of dementia treatments are exceedingly low. For many thousands of patients enrolled in ongoing or planned clinical trials, it is vital to maximise their valuable contribution alongside the efforts of drug developers by accelerating the path to treatment. BrainWaveBank's current platform is designed to provide a health technology solution to support measurement of drug mechanisms, stratification of treatment groups, and early detection of response to therapies. It consists of an easy-to-use, wearable headset, accompanied by games presented on a tablet that test different aspects of cognition, yielding brain-based biomarkers of neurophysiological mechanisms and cognitive function. In this project, BrainWaveBank will build upon their existing platform to incorporate integrated, synchronous assessment of a broader range of domains that are particularly relevant in dementia. Providing a single platform to unify measurements for clinical trials, where previously multiple different tools would have been used to cover the same ground, will significantly reduce patient burden, minimise variability across studies and dramatically reduce timelines and cost for drug developers, ultimately leading to a better understanding of disease and faster routes to market for promising treatments.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
BIOPHARM SERVICES LIMITED	Integrating Continuous Technologies Rapid Delivery of Cost Effective Biotherapeutics to Patients	£270,837	£189,586
AB SCIEX UK LIMITED		£0	£0
BIOLOGIC TECHNOLOGIES LIMITED		£250,001	£175,001
CENTRE FOR PROCESS INNOVATION LIMITED		£1,248,425	£1,248,425
PALL EUROPE LIMITED		£719,984	£359,992
PERCEPTIVE ENGINEERING LIMITED		£249,466	£174,626

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Efficient and agile production of high-quality biopharmaceuticals is of the highest priority to the biopharmaceutical manufacturing industry. The advantage of integrating multiple unit operations into a continuous process has been demonstrated by a previous consortium project, based at CPI Darlington. During that project, 3 out 4 of the end-user participant companies have moved to develop their own capabilities. The UK needs to continue to develop expertise in this area to encourage a biopharmaceutical manufacturing presence. This project builds on the proof-of-concept system developed in previous projects and adds the next required level of configurability, automation control and process intelligence:- * critical control automation and predictive performance to show real-time continuity of quality attributes and to predict consumable lifetime and changeover to avoid quality deviations (predictive maintenance). Next generation Advanced Process Control and Machine Learning techniques will be developed. These tools will create a vendor independent /scale independent intelligent control solution. * optimisation of unit operation interfaces by the incorporation of 3D-printed microfluidics to reduce volumes and therefore residence time distribution. These interfaces are also a critical point for hygienic process sampling for at-line quality analytics. * synchronising the process data generated by the system into manufacturing cost, investment required, environmental cost, production capacity and production facility requirements. These elements will be actively assessed to allow for the process to be optimised on these factors. * extending the upstream capabilities of the system to include a perfusion bioreactor. The process will utilise a monoclonal antibody product and process from AstraZeneca. Pall Biotech will continue to support the use of equipment and consumables used in the downstream process. The project brings together 5 biotech product companies, all with UK Operations and a Catapult centre. The output of a demonstrator hosted at a High Value Manufacturing Catapult open access centre will ensure dissemination of the performance, design, control strategies and business value of the integrated manufacturing technology.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
MODERN BIOSCIENCES LIMITED	Demonstrating proof of concept of a first-in-class metabolic reprogramming agent that aims to promote myelin regeneration and anti-inflammatory effects in patients with Multiple Sclerosis	£3,926,938	£2,748,857

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Project description - provided by applicants
Multiple sclerosis (MS) is the most common cause of progressive disability in young adults in the Western world. It can be a relentless, painful, and disabling condition. In a person with MS the immune system attacks the myelin sheath, a fatty protective coating that surrounds nerve fibres, which causes inflammation and injury to the sheath and ultimately to the nerve fibres. This results in the slowing down and interruption of how these neural messages are transmitted or in signals from these nerves being unable to get through to the central nervous system. If myelin is not repaired properly symptoms become permanent, leading to a steady accumulation of disability and progression of the disease, including weakened muscles, damaged coordination, and in the worst cases paralysis. MBS2320 offers the potential to slow, prevent or even reverse the progression of MS through its unique immune system modulating and pro-repair effects. With extensive pre-clinical MS data, and clinical data in patients with Rheumatoid arthritis showing good safety, tolerability and translatability into humans, the proposed project has the potential to deliver a timely solution. The project will focus on obtaining a greater understanding of the dose required and mechanism by which MBS2320 improves the outcome for MS patients by providing evidence as to how it can repair myelin in humans and reduce inflammation. A clinical trial will then be undertaken using MBS2320 to demonstrate Proof of concept in MS patients.

Results of Competition: Biomedical Catalyst 2020: Round 1, Early and Late Stage Awards

Competition Code: 2007_CRD_ASHN_BMC_2020

Total available funding is £30,000,000

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
GLAMOROUS AI LTD	Glioblastoma Multiforme Patient Stratification through Novel integration of Artificial Intelligence, Big Data and Phenotypic Screening	£282,647	£197,853
King's College London		£161,321	£161,321

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
Use the Competition Code given above to search for this competition's results

Project description - provided by applicants
Glamorous AI, a UK SME, is pioneering cutting-edge ML methods for drug and biomarker discovery. In collaboration with leading researchers from King's College London, the team aims to run a comprehensive study on GBM patients derived cell lines to deliver novel predictive biomarkers that enable efficient stratification strategies and reduce cost of treatment.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
Amber Therapeutics	Amber-UI: A closed-loop bioelectronic system for urinary incontinence	£1,582,094	£1,107,466

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Urinary incontinence (UI) is a common condition that can severely impact physical, mental and financial wellbeing. Though it is thought at least 8.5% of the global population suffer from UI, many do not admit it, with fewer than half of adults with severe UI seeking help from healthcare providers; one study found that men would rather admit to sexual impotence than symptoms of incontinence. Amber-UI will be a highly innovative implantable bioelectronic neuroprosthesis intended to provide synthetic continence reflexes in patients with UI who have not responded to simple treatments like lifestyle changes, pelvic floor exercises, medication, bladder injections, etc. Where current options for these patients consist of high-risk, variably successful surgery or dated on-size-fits-all electrical stimulation therapies that mostly only reduce rather than cure symptoms, Amber-UI will bring intelligent adaptive stimulation. It will respond to the individual patient's physiology and measurable biomarkers of both 'urge' (the sudden need to urinate) and 'stress' events (coughing, sneezing, lifting, etc). In effect, Amber-UI will restore the normal mechanisms of continence in a large group of UI patients so that they remain dry all the time---transforming these patients' lives. Conducting experimental medicine in first-time-in-human studies, this project will refine Amber-UI's minimally-invasive surgical technique so that it requires a similar surgeon skill/time commitment as current electrical stimulation therapy surgeries, and it will explore and optimise Amber-UI sensing and stimulation to ultimately provide patients with synthetic reflex control of continence.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
VINEHEALTH DIGITAL LIMITED	Randomised controlled trial of Vinehealth digital health cancer solution	£516,106	£361,274
Barking, Havering, Redbridge University Hospital Trust		£76,578	£76,578
portsmouth hospitals university nhs trust		£76,578	£76,578
Prince Philip Hospital		£76,578	£76,578
University College London Hospital NHS Foundation Trust		£76,578	£76,578
University of Surrey		£191,571	£153,257

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Project description - provided by applicants

When cancer patients describe their experiences, they say: "\[information\] wasn't explained to me...you have to seek it out yourself", "it felt like they'd give you just enough information to go away with and then move on to the next patient", and "I didn't know what to expect when I went home".\[7\]

99% of cancer care occurs in patients' homes\[8\][][0]. Patients only get information and advice from clinicians in short, infrequent appointments. Therefore, patients must learn for themselves how best to manage their health. But the information they need is spread out across many charities, websites and publications.\[2\] Often, this information is inconsistent and confusing.\[9\][][1]

Better information is also urgently needed by drug companies. Following recent regulatory changes, pharmaceutical companies must collect patient-reported information on safety and effectiveness of their cancer drugs.\[5,6\][][2] They are struggling to collect these data.\[10\][][3]

Pharmaceutical companies, clinicians and charities understand this situation is unacceptable and worsens cancer outcomes\[11\][][4] but do not have the remit, resources or technical skills to collaborate effectively to improve it.

As a small, experienced, credible and trusted technology company, Vinehealth meets the needs of patients and drug companies for better information; already leading this via partnerships across the fragmented cancer care ecosystem. Vinehealth's digital tools combine behavioural science and AI to improve cancer patient QoL, and collect patient-reported outcome (PRO) data that drug companies need.

The platform is co-developed with patients, leading UK oncologists, all major UK cancer charities, and the most significant pharmaceutical companies(Qu3Appendix:ListA/B/C).

Vinehealth includes a patient-facing mobile app that delivers personalised information and support to enable cancer patients to better self-manage their medications, side-effects, symptoms and lifestyles, seamlessly integrating with smartphones and wearables. Patients can regularly enter PRO data to drive clinical research, inform clinical service re-design and provide pharma with crucial PRO data. PRO data can increase cancer survival up to 20%.[\][5]3\]

Feasibility of the tool has been confirmed in UK's leading cancer centre (Royal Marsden). For commercial success, we must now finalise Vinehealth technical development and deliver a large randomised controlled trial over four NHS Trusts, generating robust evidence for Vinehealth's clinical and cost effectiveness in improving patient self-management and data collection.

Technical work to prepare for the trial includes ensuring Vinehealth meets the NHS sites' data governance and interoperability requirements and further developing the platform for more personalised psychological support and broader PRO measures.

[0]: https://paperpile.com/c/H8DKSw/Dinc
[1]: https://paperpile.com/c/H8DKSw/hrbH
[2]: https://paperpile.com/c/H8DKSw/5m1N+mYnj
[3]: https://paperpile.com/c/H8DKSw/HQom

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[4]: https://paperpile.com/c/H8DKSw/gePp
[5]: https://paperpile.com/c/H8DKSw/hvsV

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Total available funding is £30,000,000

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
COMBAT MEDICAL LTD	Combat Ovarian Cancer Treatment (COCT)	£1,615,591	£1,130,914
South Tees Hospitals NHS Foundation Trust		£337,740	£337,740
University of Nottingham		£46,240	£46,240

Note: you can see all Innovate UK-funded projects here: https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Project description - provided by applicants
Ovarian cancer is the biggest gynaecological killer of women in the UK with around 7,500 women diagnosed each year. Current treatment includes extensive surgery and chemotherapy, however, only 46% of women diagnosed survive 5-years. It has been shown that administrating Hyperthermic Intraperitoneal Chemotherapy (HIPEC) directly into the peritoneal cavity has a positive clinical benefit to the patient with regards to increased survival rate and reduced cancer recurrence. However, whilst HIPEC is clinically used during surgery, Normothermic Intraperitoneal Chemotherapy (NIPEC) is sparingly used outside of the operating theatre due to the inability of the patients to tolerate the treatment, infection and toxicity. Combat Medical have developed a platform that enables chemotherapy to be administered into various body cavities. The system incorporates a unique heating and pump system which enables a very accurate flow rate, with minimal pressure, at the optimal temperature. The system will enable patients to receive a clinically superior administration of intraperitoneal cancer drugs, as well as systemic chemotherapy, through the use of a bespoke catheter, which is inserted into the patient during surgery and remains in situ for up to 6 months, with limited toxicity. This project will build upon the Combat Modular Recirculation System (funded through an InnovateUK Innovation Loan) in combination with a unique long-term catheter. The aim is to first validate the modular system within clinically relevant pig studies through Combat's collaboration with The University of Nottingham. Secondly, the system will be clinically tested via our partnership with James Cook University NHS Hospital, part of the South Tees NHS Foundation Trust and the Fundacion Jimenez Diaz. The platform will provide the first clinical solution for late-stage ovarian cancer patients where cancer has metastasised to the peritoneum. The design and modification of peritoneal catheters will be undertaken so as to enable the devices to remain in the patient for the required time (3-6 months) without any increased toxicity. The combination of the two systems will provide the first in-clinic solution which enables the delivery of intraperitoneal chemotherapy to patients, outside of surgery, for up to 6 sessions over a period of 3-6 months. The successful output of the project will be a unique intraperitoneal chemotherapy delivery system with preliminary clinical data, as a stepping stone to a larger clinical, trial prior to full clinical adoption. The overall benefit being the reduction of cancer-recurrence and significantly enhancing the 5-year survival rate of ovarian cancer patients.