

# Innovate UK

**Results of Competition: Open 12 to 24 Months**

**Competition Code: 1606\_LO\_Open\_R1**

**Total available funding is £5m**

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

<b>Participant organisation names</b>	<b>Project title</b>	<b>Proposed project costs</b>	<b>Proposed project grant</b>
MacDermid Autotype Ltd Loughborough University	New Generation Nanocoatings for Automotive Interiors (NEWNANO)	£360,733	£234,476
<b>Project description - provided by applicants</b>			
<p>The main objective of the project is to overcome technological challenges to take to market new generation coatings for the automotive industry with improved properties and enhanced performance. To be able to achieve this, it is proposed to undertake this collaborative project to develop a process that can be employed to produce coatings with functional nanoparticles in their formulation in quantities beyond lab scale and pave the way for industrial scale manufacture and commercialisation. Such new formulation coatings will be used to enhance surface properties such as hardness, abrasion resistance and anti-fingerprinting whilst maintaining desirable optical properties such as clarity and colour. A significant enhancement beyond the state-of-the art of coating hardness has been achieved in initial trials from new formulations prepared at bench scale, whilst maintaining the ability of the coating to be processed into 3D shapes by vacuum forming. Current industrial need to develop new technologies to produce these in larger quantities whilst maintaining their superior performance remains to be the challenge to address in this project. Success in this project will enable the introduction of new scratch resistant and easy clean coatings into automotive interiors. This will put MA at a competitive edge increasing its market share in the sector by an estimated x10, its production based in the UK by 25% and thereby employment opportunities.</p>			

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<b>Cellular Therapeutics Limited</b>	SEAMLESS: Second generation Adoptive cell therapy using MoLEcular growth SwitcheS	£419,517	£188,783
<b>Project description - provided by applicants</b>			
Within the UK, melanoma incidence rates have increased more rapidly than any of the 10 most common cancers in the past 30 years, with a 518% increase in males & 253% in females. Best in-class immunotherapy for metastatic melanoma is checkpoint inhibitors (nivolumab, ipilimumab) however limitations such as high chance of relapse, high cost & severe toxicity create a demand for new improved treatments. An alternative approach under development is T-Cell therapy, specifically in relation to melanoma treatment Tumour infiltrating lymphocytes (TILs) hold great promise with positive results in early clinical trials, they target cancer specific mutations & are thus truly specific reducing risk of autoimmune toxicities. TIL therapy however requires supportive treatments which give rise to toxicity and leave patients in an immunocompromised state. During this project Cellular Therapeutics Limited (CTL) will address this challenge by developing a novel TIL therapy which uses an optimised TpoR receptor to abolish the need for pre-conditioning & supportive IL2 => little/no toxicity. It will be a one-off treatment which has improved response rates towards Eltrombopag in absence of IL2 which is currently used to engraft cells & has the ability to selectively expand cells in the patient => enhancing the efficacy & increasing durability.			

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MindX Limited	A Revolution in Psychometric Testing to Increase Efficiency and Accuracy of Employee Recruitment	£498,728	£224,427
<b>Project description - provided by applicants</b>			
<p>Despite widespread &amp; longstanding use of psychometric testing during recruitment, studies have shown that limitations leave 75% of organisations desiring new improved approaches to pre-hire assessment (CEB, 2013) e.g. self-reporting causes inaccuracies, candidates may falsify results; lengthy time to complete (~1hour); high cost of £20 (short basic) - £300 (incl. detailed feedback) which is not economical/suitable for SMEs; stressful effect; high dropout rates (~20%); subject to practice effect =&gt; favour higher socioeconomic groups with access to funds for practice tests/support. Games Based Assessment (GBA) is an emerging field which uses video games to overcome these limitations by measuring actual behaviours &amp; decisions, therefore providing an assessment process which is more objective &amp; harder to falsify. Market uptake is however limited with current suppliers adopting poor commercial models, games having narrow sector appeal &amp; poor scientific validity. MindX Limited (MXL) will complete a 15-month Experimental Development project to develop MindX; a GBA recruitment platform including 3 unbiased, scientifically validated video games, a manager portal &amp; analytical tools. It will disrupt the global recruitment industry by enabling accurate, rapid (15mins/candidate compared to 30mins for competitors) &amp; cost effective (£5/assessment compared to £20-£300 for competitors) assessment of candidates for the first time =&gt; enabling SMEs as well as large orgs to adopt the approach.</p>			

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Cella Energy Limited Productiv Limited Batcam Ltd	Lightweight hydrogen power system and multi-rotor drone achieving over 60 minutes flight endurance	£999,952	£699,966
<b>Project description - provided by applicants</b>			
<p>Unmanned aerial vehicles (UAVs) are an emerging technology platform delivering unique surveillance and reconnaissance capabilities across a broad range of market sectors (from law enforcement to media and entertainment). Due to the high power capacity of multi-rotor drones, existing lithium ion batteries only enable an operational flight endurance of 12-20 minutes, impacting on utility time, range and necessitating the use of multiple drone teams; thereby adding cost and restricting market application. The project will develop an innovate light weight solid state hydrogen power system achieving a specific energy density more than double that for Li-ion batteries. Combined with lift efficient drone design the project will achieve and demonstrate (flight testing) operational flight times in excess of 60 minutes; representing a &gt;300% improvement compared to the state-of-art. Furthermore, the technology prototype will be redesigned for manufacture and certified for sale and use, thereby accelerating route to market. Extended endurance enables drone users to eliminate the need for multiple drone teams (&gt;50% cost savings), increase payload capacity (drone capability) and/or achieve more during each flight. The technology demonstrates unique disruptive potential within the global market for small (&lt;20kg) UAVs estimated to be worth &gt;£1.73 billion by 2020 with a CAGR of 22.2%. Through clear differentiation, added value, patent protection and establishment of a global export infrastructure, the consortium target &gt;£50 million new business growth within a 5 year period demonstrating a &gt;50 fold ROI.</p>			

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<b>Parker Hannifin Limited</b>	Engine Integrated Super Impact Blow-by Gas Ventilation	£992,768	£496,384
<b>Project description - provided by applicants</b>			
<p>Industrial research activities undertaken by Parker Hannifin seek to develop a first-of-a-kind engine technology for prolonging the optimal performance of medium and heavy-duty vehicles (e.g. haulage trucks, agricultural tractors, excavators). The technology, an advanced crankcase ventilation filter - employing a novel super impaction technique - protects the vehicle's turbocharger from fouling, and thus prolongs the system's optimal performance over its lifetime. A reduction in GHG emissions and air pollutants (e.g. NOx, HC, PM), and improved fuel consumption and vehicle service life are in-direct benefits accrued. Intelligent product design minimises the technology's production costs and enables the achievement of a retail target price significantly lower than current rival best-in-class solutions. The economical retail price means cost-sensitive builders of medium-duty engines will, for the first time, be able to include premium fit-for-life™ crankcase ventilation components in their builds. Funding is requested to accelerate and expand Parker's current development programme to validate bespoke prototype technologies on several target engines. Parker's UK-based Racor Division - an established global Tier 1 supplier of fuel, air, and oil filtration systems - will collaborate with a number of major European OEMs to validate bespoke technologies via a series of in-field trials. The project is expected to run for 18 months. Market launch is foreseen soon after project completion.</p>			

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<b>Avalon Sciences Limited</b>	New Passive All Optical Seismic Survey System	£367,909	£220,745
<b>Project description - provided by applicants</b>			
<p>Seismic exploration requirements are constantly pushing the boundaries of measurement capability: very high temperatures and pressures are directly related to the depth of a survey. Electronic systems for producing surveys are inadequate in many deeper boreholes because the electronics are pushed beyond the limits of their capability. An equivalent passive fibre system offers the promise of improved sensitivity, as well as considerably better tolerance to higher temperatures. However, to develop this system, it is necessary to design a new optical architecture which aligns with the stringent requirements of the borehole system. Specifically, only a small number of fibres are available, and yet several hundred sensors must be connected. Part of this architecture will rely on the ability to access specific fibres contained in an armoured bundle without damaging or touching the other fibres; the delicate process for achieving this is challenging and requires considerable R&amp;D effort. If successful, this project will enable Avalon Sciences to broaden its market share as well as enter new global markets. Furthermore, the expansion of our optical facilities will provide a unique and useful resource for local SMEs, as well as a valuable opportunity for local schools to observe more of advanced technology and engineering.</p>			

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Jingo Juice Ltd T/A Marshmallow Laser Feast University of Bath	Deformable Objects for Virtual Experiences (DOVE)	£562,559	£432,415
<b>Project description - provided by applicants</b>			
<p>At present there are no solutions at market that can rapidly generate a virtual reality 'prop' from a generic object, and then render it into an interactive virtual environment, outside of a studio. A portable solution such as this would enable creation of deployable immersive experiences where users could interact with virtual representations of physical objects in real time, opening up new possibilities for applications of virtual reality technologies in entertainment, but also in sports, health and engineering sectors. Project dove, 'Deformable Objects for Virtual Environments,' will combine novel algorithmic software for tracking deformable objects developed at the University of Bath's (UoBath) CAMERA research centre, interactive stereoscopic graphics for virtual reality, and an innovative configuration of existing hardware, to create the Marshmallow Laser Feast (MLF) DOVE system. The project objective is to create turn-key tools for repeatably developing unique immersive experiences and training environments. The DOVE system will enable MLF to create mixed reality experiences such as live productions, serialised apps &amp; VR products/experiences to underpin significant business growth and new job creation opportunities. The demonstrator application - Sweet Dreams - will showcase the innovations achieved through DOVE in the world's first VR dining experience, created in collaboration with FDEK.</p>			

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<b>World Feeds Limited</b>	Ambient temperature extrusion process to manufacture micro-pellet aqua-feed for aquaculture industry	£373,703	£168,166
<b>Project description - provided by applicants</b>			
<p>According to the UN, the world's population is projected to reach 9.3 billion by 2050 and the present per capita availability of protein cannot be met by livestock and dairy farming sectors alone. Conservation International states that the low environmental impact of aquaculture should be expanded to alleviate the growing global food crisis. Expansion in aquaculture however is prohibited due to the high cost and limited availability of live feed e.g. Artemia. Similarly, salmon production is affected due to the low volumes of wrasse cleaner fish available to delouse salmon from parasitic sea lice - this is a major problem in the sector and is affecting Scotland, Norway, Ireland and Chile. WFL wish to develop new aqua-feed formulations as well as a new high-throughput processes capable of manufacturing high quality micro-aquafeed pellets. The proposed aqua-feed will allow for sustainable and cost effective rearing of fish species at substantially reduced cost compared to using live feed. WFL estimate savings could be as high as 55-60% since the proposed nutritionally rich aqua-feed will necessitate the need for reduced quantities to be utilised as feed. Nutritionists have evaluated cheaper feeds based on vegetable proteins but are associated with decreased growth rates and therefore yields [FAO].</p>			

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Lupe Technology Limited	Energy Recovering Vacuum Cleaner 2 (ERVaC2)	£300,851	£135,383
<b>Project description - provided by applicants</b>			
<p>Vacuum cleaners are an essential part of any domestic or commercial hygiene schedule, and represent a dynamic and lucrative market for product manufacturers. In recent times, vacuum cleaners have come under increased regulation in terms of energy efficiency, as well consumers demanding more in terms of performance, allergy protection and aesthetic design. The Energy Recovering Vacuum Cleaner Stage 2 (ERVaC2) project will see Lupe Technology (LT) develop a pre-production prototype of a revolutionary alternative system configuration to traditional vacuum cleaners. The benefits of this system have been proven by the Proof of Concept Energy Recovering Vacuum Cleaner (ERVaC) project already completed. ERVaC2 will see the development of the product from bench-top technical prototypes through to pre-production prototypes that will work, and look like the intended production articles.</p>			

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Your Finances Ltd	YOFI - Your Finances Limited	£415,261	£290,683
<b>Project description - provided by applicants</b>			
<p>YOFI wishes to significantly change consumer engagement with personal finances and savings. Finance is an intimidating and unengaging subject for many and the financial product landscape is confusing and inaccessible. The closure of corporate Defined Benefit schemes has resulted in the need to save individually for retirement. 11m UK people are not saving enough for retirement (37% don<sup>TM</sup>t plan to save at all) and risk pension poverty. 90% of UK consumers have no formal personal finance education, personal debt is increasing and consumers lack intuitive and engaging tools to understand finance. YOFI will be a unique personal financial planning platform allowing users to understand their financial position, set goals, view progress, access advice and invest in customised financial products. YOFI will simplify complex finance and investment concepts using graphical representation &amp; behavioural psychology.</p>			

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<b>PowerAll Limited</b>	PowerAll Swap-Out Alternator	£311,119	£140,004
<b>Project description - provided by applicants</b>			
<p>PowerAll Ltd design, manufacture, market and install a range of power generation equipment for installation in vehicles. The main applications include mobile workshop, off road, road/rail repairs and canteen / welfare facilities. There is an increasing requirement for this type of equipment due to H &amp; S concerns about carrying additional fuel for mobile generators, weight and expense. To date the PowerAll solution is to install an additional alternator but this has become increasingly non-viable primarily due to space limitations as vehicle designs are constantly utilising all engine bay space available. The solution is to replace the vehicle alternator with a specially developed alternator and control system that can provide the 12v required for the host vehicle system and the alternative power requirements for a wide range of applications. This project addresses an increasingly problematic need for many different users requiring multiple power options in a highly innovative way - both technically and commercially. The potential for such a product is globally significant, covering all markets and will have a transformative impact on PowerAll, enabling the business to increase total sales by a multiple of 4 in the following 3 years, uniquely creating a hugely competitive position and generating an ROI &gt;50% at the end of the 2nd year on project additional sales of £1.5m. The approach being taken is unique - this solution has never been tried before. There will be technical challenges around host vehicle integration but PowerAll are confident these can be overcome.</p>			

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<b>Incus Performance Ltd</b>	Incus HALO: An advanced wearable device for swimming and sport monitoring	£436,520	£305,564
<b>Project description - provided by applicants</b>			
<p>Incus Performance Ltd. has developed artificial intelligence algorithms and innovative wearable devices that provide greater training insight and motivation for people engaging in sport. This addresses the need for more detailed performance monitoring and technical insight in sports such as swimming, that current wearables and Gold Standard™ measuring techniques do not address. The Incus HALO device uses proprietary AI algorithms and ground-breaking new sensors to measure a user's technique and key vital signs in real time. HALO uses these data to produce the world's-first truly actionable training feedback in market-leading detail, and conveys it through an intuitive, dynamic, infographic mobile app. Incus HALO is not another wrist-worn device. Its unique mount and patent-pending harness™ provide unobtrusive, symmetrical data capture and measurement of the entire body. Incus is working in unique collaboration with swimming governing bodies to produce the next generation of wearable sports technology. In this project, Incus HALO will demonstrate its potential by assisting Team GB's next generation of medal winning athletes, in preparation for Tokyo 2020.</p>			

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<b>Dithen Limited</b> Soundmouse Limited Media Research Partners Limited (T/A The Media Institute)	DELVE-VIIDEO: Deep-Learning based Bitstream Analytics for Value Discovery in Video	£439,996	£307,997
<b>Project description - provided by applicants</b>			
<p>The DELVE-VIDEO project creates a robust and performant ecosystem of software tools and infrastructure components to uniquely identify and describe video attributes within networks and file systems. This establishes a foundation for content owners and service providers to protect their video assets from piracy, measure viewer traffic, and enrich asset management, rights management and recommendation services, all with substantially advanced simplicity and automation in comparison to existing methods. The project builds on novel video signature extraction technology developed by TMI/UCL (in part via Innovate UK -supported project Video Clarity) and Dithen. Deep learning methods will now be added and the signature extraction and content classification will be carried out predominantly using compressed domain information, coupled with very limited decoding. The principal aim is to enable unique semantic identification of media regardless of platform (film, television, web, OTT, mobile) or encoding characteristics. Compelling new commercial services and technology licensing opportunities will be launched by the project partners, enabling new levels of analysis and reliability for copyright protection and information services.</p>			

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<b>Crown Packaging UK Limited</b> Valtris Speciality Chemicals Ltd Sherkin Technologies UK Ltd	SUNBEAM – SUstainable ElectroN BEAM curable bio derived coatings for metal packaging	£471,791	£250,598
<b>Project description - provided by applicants</b>			
As the population of the plant increases, so too does the demand for food and beverage. Increasingly consumers are focused on packaging that is sustainable. Crown and Valtris would like to further enhance the sustainability of their products. To help achieve this, this project will facilitate rapid iteration of coating formulations and faster optimisation to reduce time to market with respect to traditional methods of experimentation, as well as introducing novel, and more sustainable curing techniques and materials.			

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