Innovate UK

# Results of Competition: ICURe: Open Competition for Spin-Out Companies

## Competition Code: 1804_ICURE_OPEN

Total available funding is £1.5 million

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 |
|---|---|---|---|
| Green Epoxy Solutions | Conversion of glycerol into glycidol, a high value speciality chemical | £299,713 | £209,799 |

Note: you can see all Innovate UK-funded projects here https://www.gov.uk/government/publications/innovate-uk-funded-projects
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Funders Panel Date: 27/06/2018

| Project description - provided by applicants |
| --- |
| GES, a Queen's University Belfast spin-out company have developed an innovative, sustainable and green process to convert glycerol (a biodiesel waste product) into the high value speciality chemical, glycidol. Glycidol is a more sustainable, green and safe alternative to petrochemically derived epoxides feedstocks such as ethylene/propylene oxide and epichlorohydrin for use in the production of a range of products used in everyday life, including surfactants and coatings. The byrpoducts from this process, polyglycerols are used in drilling fluids, polymer synthesis (e.g. polyurethane foams) and in personal care products.<br><br>This project is supported by Queen's University of Belfast (QUB) (GLT) and Green Lizard Technologies Ltd. The initial R&D for was carried out in the laboratories of the School of Chemistry and Chemical Engineering at QUB. Following an Innovation to Commercialisation of University Research (ICURe) funding award to explore the commercial potential of the glycidol production technology, it was decided to set up GES to exploit the significant business opportunities in this space. GLT are a highly ambitious spin-out company from Queens University Belfast which provides green technological solutions to the chemical sector with the goal to both licence and manufacture its technologies. The process technology will be demonstrated at GLT's pilot plant facilities in the Wilton Centre in Teesside. |

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| POWER ENABLE SOLUTIONS LIMITED | Autonomous Wind Turbine Optimisation Software - AWTOS | £159,880 | £111,916 |
| University of Edinburgh | | £32,670 | £32,670 |

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| Current WT control systems do not optimise the end to end system and are set up with factory default settings to optimise individual elements of the drive train such as the generator and inverter. Factory settings are not optimal due to site specific wind turbulence and machine to machine variability caused by wear and tear. Non-optimised control leads not only to reduced electrical output, but increasing stresses on the WT structure and components, which can reduce useful asset life and increase maintenance expenditure.<br><br>The PES company vision is to be the leading global player in the application of next generation control algorithms to optimise the end to end performance of Wind Turbines (WTs), increasing electrical output), reduce maintenance cost, and extend asset life. PES is developing AWTOS (Autonomous Wind Turbine Optimisation Software) which has the potential to increase WT electrical output by 6% which is significant for the wind industry as on a typical wind farm, a 6% improvement in AEO can double the net profit to the owner.<br><br>To date PES has received public funding which has developed the initial AWTOS prototype which has full patent protection in a number of countries and has full freedom to operate.<br><br>The initial AWTOS prototype has been shown to work in a controlled environment and the next stage is to test it on real WTs. The aim of this project is to develop AWTOS by testing AWTOS on a WT in the field. PES has partnered with a leading European WT manufacturer and operator to gain access to a number of operational WTs. This project will be an important stage in developing AWTOS in to a proven control system that can be sold to WT operators globally.<br><br>PES was part of ICURe cohort 12 which provided invaluable market intelligence. The insights have helped refocus the business model and the initial market target. The initial offering will improve WT output by 6% which provides a 12 month payback to the operator. Initial revenues will be generated from a one off fee but this will develop into a service fee as the business develops. |

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| iCOMAT | Commercialisation of a Step-changing Innovation in Automated Composites Manufacturing | £289,778 | £202,845 |

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| Project description - provided by applicants |
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| This project aims at taking an innovative automated composite manufacturing technology born at the University of Bristol out of the lab for commercialisation through a university spin-out company. This technology enables steering carbon fibres along curved paths without defects, which allow the manufacture of defect-free carbon fibre composite components with complex shapes and optimisation of their performance beyond current levels. This technology can have a significant impact on future composite products in automotive, aerospace and wind energy sectors where the structural efficiency is becoming more and more critical to reduce the CO2 emissions.<br><br>The technology is now ready to move from a university research project and to be developed alongside commercial composite design and manufacturing activities. In order to gauge the future market potential, the project team carried out a 3 months market research and built an initial business plan through the ICURe Innovation to Commercialisation programme (Cohort 10). This project aims at further developing the business and technical maturity to commercialise the step-changing composites technology through a spin-out company. During the period of project, the spin-out company will focus on developing the business plan and increase the technical readiness level of the technology by collaborating with a potential end-user as well as the National Composites Centre. Furthermore, the team's long-term vision is to create a high-tech engineering company that will supply this innovative composites manufacturing technology to the UK's and global composites industry. This project is an important stepping stone to raise the business profile of the company and attract private investment. |

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| GEN3D LTD | Gen3D | £119,395 | £83,576 |
| University of Bath | | £51,155 | £51,155 |

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| Project description - provided by applicants |
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| Additive manufacturing (AM), often referred to as 3D-printing, is disrupting the way products and components are designed and manufactured. As AM processes manufacture components one layer at a time, complex geometries can be created without the added complexity of having to program the AM machine. Designers are now using these processes to produce previously unthinkable components with staggering performance benefits. However, these benefits often come at significant cost.<br><br>Market research suggests that the design of a complex AM component may take eight weeks to perfect, including between three and ten manufacturing iterations to develop a production-ready design. Furthermore, large AM components can spend as many as 30 days on the printer. Manufacturing failures can occur at any time within this window and often do. When this is combined with the significant capital investment requirements for an AM process and the inflated cost of powdered materials, these failures can stretch cash-flow and production schedules to breaking point.<br><br>Research at the University of Bath has developed a series of algorithms to automatically design components for AM processes. This means that components can be designed simply by specifying the functional requirements for the part (loads, holes for fastenings, keep-out zones, ducts for fluid flow etc.). Additionally, the algorithms automatically filter out component geometries that are likely to cause downstream manufacturing issues. This 'generative design' tool empowers engineers to rapidly create complex designs whilst minimising the risk of in-print failures.<br><br>The ICURe programme allowed us to test our market hypotheses regarding the need for such a product and identify potential end-users. Initial engagement with companies confirmed that there is an appetite for a generative design tool with a focus on manufacturing constraints. This direct feedback from industry helped to formulate the initial business model to commercialise the underpinning research. This culminated in the recommendation to 'spin out' by the ICURe programme review panel, which has led to the incorporation of a new start-up, Gen3D Ltd.<br><br>This ambitious project aims to grow the Gen3D business, validate the associated business model and use further academic research at the University of Bath to build credibility in the Gen3D software product. This project will drive growth in terms of Gen3D employees, taking the product to market and engagement with target customers. Through software sales, tailored consultancy and up-skilling of customers through training, we aim to establish Gen3D as an exciting new company within the global AM market. |

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| CYTECOM LTD | Rapid, portable, live bacterial cell detector | £209,188 | £146,432 |
| University of Warwick | | £84,671 | £84,671 |

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| Project description - provided by applicants |
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| Cytecom is an innovative new spin-out company from the University of Warwick with technology that will revolutionise the process of testing products for bacteria. As a result of the ICURe program we were able to guide our scientific discovery process with new information from markets and businesses. This allowed us to identify a clear need for a fast reliable and accurate bacteria detector. Current (reliable) methods require 48-72 hours. This causes delays and uncertainty during manufacture of beverages, food and during medical evaluations. Our technology allows the detection and identification of live bacteria at the flick of a switch (less than one hour) without sacrificing accuracy. This is a dramatic improvement on existing technologies. This funding will allow us to take our laboratory prototype detector and make a version which is compact and can be deployed in the field, providing these unique capabilities to the people who keep our food and water safe and ultimately accelerating diagnostic processes for medical professionals. |

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| Verdel Instruments | Innovative approach to Mass Spectrometry to provide high speed analysis and high quality of data to the Food Safety and Pharmaceutical industries | £140,420 | £98,294 |
| University of Warwick | | £36,498 | £36,498 |

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| Project description - provided by applicants |
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| Verdel Instruments Ltd, a spin out company from the University of Warwick, is developing an innovative technology which will allow scientists to obtain detailed structural information for thousands of molecular compounds simultaneously using the new technique called two-dimensional mass spectrometry (2DMS). 2DMS allows a user to fragment a wide range of molecules simultaneously and, at the same time, keep track of which fragments come from which precursor molecules. Effectively, we are able to perform these fragmentation studies in parallel on all compounds at once, rather than serially, with one compound at a time, which greatly speeds up the experiment. While the first versions of the technology were developed on very advanced mass spectrometers and have only been used in academia, we now have developed an approach which is suitable for routine, benchtop mass spectrometers which will be fast enough to provide these comprehensive fragmentation datasets in a few seconds and fast enough to be compatible with chromatographic techniques.<br><br>The food safety and pharmaceutical industries use mass spectrometry, and similar fragmentation studies, routinely to identify the molecules in their formulations, detect potentially harmful contaminants, and to quantify important compounds. Our new 2DMS technology will greatly improve the data quality and speed for those kinds of analysis. This project will be primarily about testing out our new methodology on a range of samples from the food safety and pharmaceutical industries. The overall goal of this Innovate UK project is to quantitatively determine how, where, and how much this technology will benefit those industries. |

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