Supporting the UK chemistry-using industry

Chemistry-led innovation is integral to a vast number of sectors, including life sciences, energy generation, the automotive industry, construction, and consumer products; the chemistry-using industry contributes over £15bn added value per year to the UK’s GDP.

Supporting the growth of this industry and enabling chemistry to remain at the forefront of research and innovation is a priority for us. We support over 2500 companies of all sizes and stages – from pre-startups to multinationals. And as our industry is composed of 96% small companies, we have a particular focus on facilitating their development and growth.

EnterprisePlus

EnterprisePlus is our dedicated service for UK based, R&D focused SMEs in the chemistry-using industry. Our focus is to give smaller companies the connections and exposure they need to bring their innovations to the wider world. We support over 315 companies via EnterprisePlus, providing access to expertise, knowledge, funding and talent to facilitate growth.

Find out more at www.rsc.org/sme

Chemistry Means Business

Our flagship event for the chemistry-using industry brings together early stage companies, established SMEs, multinationals, academic entrepreneurs and funding organisations from across the UK and Europe. Each year we hold this event to showcase emerging technologies, spark innovation, forge collaborations, and discuss sector trends in energy, health, food and materials.


Find out more at rsc.li/cmb2018

Emerging Technologies Competition

Our annual innovation competition supports early-stage companies and academic entrepreneurs with the commercialisation of their technologies in the fields of health, materials, energy and food. The technologies receive early validation from senior representatives in industry, and winners are provided with tailored support from multinationals, extensive business training, financial mentoring, and funding.

Over 350 technologies have been identified through the competition since 2013. Sixteen of our winners have gone on to raise a combined total of over £31m in investment and grant funding, and one has undergone a £28m trade sale.

In addition, we’ve seen university groups spin out in to promising businesses, and companies expand overseas, enter commercial contracts, conduct industrial scale trials, and collectively double their number of employees.

Find out more at rsc.li/EmTech18
Roderick has spent the last 15 years managing, founding and growing angel groups and investment platforms that have deployed over £100m of equity investment in more than 500 startup and scaleup businesses. He now oversees connectivity, training and best practice support for over 170 angel groups, VCs, investment platforms, accelerators, universities, government agencies and corporates.

The UK Business Angels Association (UKBAA) is the national trade association for angel and early-stage investment, representing over 160 member organisations and around 18,000 investors. Business angels in the UK collectively invest an estimated £1.5 billion per annum and are therefore the UK’s largest source of investment for startups and early-stage businesses seeking to grow. UKBAA’s members include angel networks, syndicates, individual investors, early-stage VCs, equity crowdfunding platforms, accelerators, professional advisers and intermediaries. UKBAA acts as the voice of the angel investment community and strives to build and connect the angel investment ecosystem so as to ensure a coherent landscape for financing high-potential entrepreneurs.

The UKBAA DealShare is a private, members-only platform designed to improve deal flow and create co-investment opportunities for the UKBAA community. The DealShare allows UKBAA members to share deals with one another via a simple online marketplace, either by listing and managing the deal themselves, or by referring an entrepreneur that can be invited to do this directly.

This information contained within this document is not intended to constitute a financial promotion for the purposes of Section 21 of the Financial Services and Markets Act 2000 and the Financial Promotion Order 2005 and does not amount to a personal recommendation or advice on the merits of the deal. All investment decisions are made at the risk of the individual investor.
Current cancer-targeted therapies lack potency, tolerability and suitability for solid tumours. Antikor is developing the next-generation of antibody therapeutics specifically tailored to deliver high quantities of cytotoxic payload rapidly and deeply into solid tumours, with improved safety benefits.

The Problem
One of the most active areas of cancer therapy R&D is the development of Antibody Drug Conjugates (ADCs): powerful toxin ‘payloads’ attached to antibodies precisely targeted to the tumour. ADCs are clinically and commercially validated but, especially for solid tumours, have failed to live up to their promise due to three critical limitations: (1) Low potency, (2) Poor/slow solid tumour penetration, (3) Poor tolerability. This leads to ADCs having a low therapeutic index in patients with much room for improvement. Antikor aims to do this by solving all the above problems. Antikor is specifically applying its technology to gastric cancer (GaCa), a major unmet medical need of which 80% is incurable and an abysmal five year survival rate of <10%.

The Solution
Cancer-targeting antibodies are well established, however, smaller formats have many advantages (1) Rapid tumour penetration, (2) Faster clearance from normal tissues, (3) Inexpensive manufacture. Despite this, their utilisation has been unsuccessful. Antikor’s technology, enables antibody fragments to have a high drug antibody ratio (DAR) leading to a new class of products called Fragment Drug Conjugates (FDCs). FDCs, made more effective using our technology can address difficult solid cancers and could revolutionise ADC cancer therapeutics. Antikor has recently developed an ‘FDC Discovery Engine’, for identifying FDC products to any target. Focusing on gastric cancer, we are discovering lead candidates against a validated target, expressed in around 75% of patients as well as a potential role as a cancer stem-cell marker, metastasis and correlation with poor prognosis.

Traction & Achievements
We have pre-clinical data showing we can make high affinity, high-DAR FDCs which penetrate breast and gastric cancer tumours more effectively than ADCs whilst clearing from the circulation more rapidly leading to low normal tissue exposure. Independent non-GLP toxicology studies have shown better tolerability than ADCs and a lower dosing of FDCs can lead to more impressive tumour cures in breast, ovarian, prostate and gastric cancer xenograft models. Antikor are in collaborative discussions with multiple major biopharma companies. We filed broad UK patent in 2014, PCTs in 2015 and prosecuting in all major global territories with promising results so far. In late 2016, Innovate-UK awarded Antikor an £810k grant (started in 2017) to develop its first product for gastric cancer.

The Investment Opportunity
Antikor is seeking to raise £1.5m in order to achieve four key, value-enhancing milestones (1) Selection of its GaCa product for clinical development, (2) Strengthening its intellectual property including patent grants, (3) Establishment of partnerships with at least one major biopharma company, (4) Expansion of its preclinical pipeline with further products. This will enable Antikor to raise a series A funding round of ~£10m at a substantially higher valuation in order to generate the clinical data needed for a high-value acquisition or IPO and a return-on-investment.
CuanTec are a blue biotech company, creating compostable, antimicrobial food packaging that makes fresh food last longer. We have revolutionised chitin extraction through a scalable biological process and we design biodegradable products aimed at food and med-tech markets.

The Problem
Food waste is an environmental, financial and moral disaster. A third of food produced in the western world is wasted and 10% of that waste is found between farm and shop. Much of that waste is combined with plastic packaging and finds its way into landfill and waterways causing stench and pollution. Plastic pollution is finally being voiced as the environmental catastrophe, and the world is being challenged to find solutions. CuanTec can provide the answers to both.

The Solution
By creating a novel fermentation process to extract chitin from shells of crustaceans, CuanTec provide a low cost, low energy way to obtain high quality chitin that can be scaled and deployed where the waste is created, providing a means of valorising waste from fisheries and preventing accumulation of food waste in landfill. Converting chitin to chitosan in GMP facilities ensures reliable, pure chitosan can be created and used to create food packaging that is compostable and antimicrobial, thereby providing an alternative to polluting oil-based plastics in the food industry and through the subsequent extension of shelf-life of fresh food, reducing food waste. CuanTec have focused on a truly circular economy solution – taking shells from the processing of langoustine and working to develop their first product as a food contact material for salmon. We also have Zero Waste ambitions and in the future will upcycle the liquid phase from the fermentation to fish food.

Traction & Achievements
CuanTec has a team of five, providing chemistry, microbiology and business skills in our two locations in Scotland – Glasgow and Oban. In 15 months we have created our biological extraction method and proven its scalability. We are working at 50kg of shell batch and will progress to 300kg soon. We have three prototypes of flexible film, food contact materials, all created using standard industrial methods and developed in partnership with potential future customers and we have plans for more products to replace single-use plastic for the brewing and dairy industries.

Our IP is not patentable but is protected through licensing tailor-made versions of the process to partners to enable us to expand production. We have three EU trademarks for our first three product ranges: CuanSave (food packaging) CuanBia (fish food) and CuanSpill (water remediation)

Our business started with £200k obtained through a SMART grant, equity funding and additionally winning the top prize £150k at Scottish EDGE in June 2017. We are applying for further grant funding and have recently launched a crowdfunder to raise awareness and match-funding.

The Investment Opportunity
We require £750k to allow access to public sector grants of £1.2m for capital expenditure on production facilities, to expand our team and to enable regulatory approval for our products.

This will enable us to be the first compostable, antimicrobial, food contact material to market with potential of £1m sales in 2019.
Immaterial manufactures super-adsorbent nanomaterials that can dramatically reduce the cost of separating, storing and transporting gas.

The Problem
The separation and storage of gases generally requires high compression (250+bar) or liquefaction (below ~-150 °C). Such methods are both expensive and extremely energy-intensive. An alternative exists: some classes of porous nanomaterials are able to act as ‘molecular sponges’, selectively adsorbing gas molecules. These can be used to separate mixtures of gases at modest pressures or to store a far greater quantity of gas at a given pressure. The most promising materials are known as metal-organic frameworks (MOFs). MOFs have been studied for over two decades, garnering significant scientific interest and industrial investment for a range of applications. Despite their potential, their natural, powder form has been a persistent barrier to commercialisation. Fine powders are extremely difficult to handle with compressed gases. Attempts to pelletise the materials substantially degraded the performance.

The Solution
Immaterial has developed and patented the only known solution to this problem. We are able to manufacture stable crystallites (monoliths) that can be grown to any size and shape. Not only do these avoid the usual drop in performance associated with pelletisation, by increasing the packing density they actually increase capacity by up to four times. They furthermore offer around 130% increase in hardness over compacted pellets, going a significant way towards solving crumbling.

Traction & Achievements
The work on the technology to date has been driven to a large extent by Shell, who are funding Immaterial’s co-founders’ research in the Department of Chemical Engineering at the University of Cambridge. They are interested in developing MOFs for natural gas storage as an economical alternative to LNG shipping. For other applications, Immaterial has engaged, among others, 3M, the US Department of Defense, CBRN UK, and a major manufacturer of activated carbon for respiratory protective equipment; GSK for the development of MOF-based catalysts for drug synthesis; and a US-based MOF company for the development of a monolithic version of their material for the storage of hydrogen. Immaterial has been extremely successful in securing non-dilutive funding through grants and competitions for both the company and the academic group. To date, these total nearly £900k and include among others: Royal Society of Chemistry’s Emerging Technologies Competition’s first prize, EPSRC (two grants), Innovate UK Energy Catalyst & Design Foundations, and the Royal Society.

Immaterial has also participated in three accelerators: The Royal Academy of Engineering, Accelerate Cambridge and Climate-KIC. We have also just been awarded a place on the new TechX accelerator (worth £100k) run by the Oil & Gas Technology Centre.

The Investment Opportunity
The company is seeking around £4m in funding, of which we are expecting £1m to come from Cambridge Enterprise, and a further £1-2m from Shell Technology Ventures. The funds will be used to construct a flexible manufacturing facility capable of satisfying initial, low-volume markets such as gas mask filters directly, and of demonstrating that the process can be performed at an industrial scale, from which licenses can then be sold. The funding will last three years and sustain the company until it is cash-positive.
Mimica will be the globally recognised mark of product freshness and safety for communities, consumers and business all around the world.

The Problem
‘Use-by’ and other date-codes for products, from food to pharmaceuticals, are based on worst-case supply-chain conditions.

Under ‘average’ conditions, products often last longer, and fresh, safe products are unnecessarily discarded.

Globally, one-third of date-code led waste isn’t necessary. Perhaps through mismanagement, spoilage can also occur earlier than date-codes indicate, posing significant health and commercial risk.

The Solution
Mimica designs and produces ranges of simple, cost-effective, IP protected, biologically accurate freshness indicators for food, medicines and other critical product groups.

The Mimica Touch range of labels will turn from completely smooth to obviously bumpy as soon as products become unfit for purpose. This tactile change is designed to be accessible to all groups, including the visually and cognitively impaired. An accompanying colour change will be a further development.

Mimica Touch will drive waste down and sales up; all while guaranteeing safety to consumers

Traction & Achievements
Mimica Lab Ltd. has hit several critical milestones:

Leadership
Mimica has recruited – as CEO and COO – the only team to have successfully cracked the freshness-extension market. They built startup It’s Fresh! into a company whose product is in Walmart and which is currently valued at $100m.

Finance
Mimica’s initial work was funded through £200,000 in grants and prizes; the company is currently closing a successful seed round (£260k in on a £700k round, pre-money valuation of £2.5m).

Patent
Mimica’s USA patent has been approved and will be granted once payment has been processed.

Trials
Mimica has signed an agreement with dairy producer Arla to conduct a series of consumer studies starting April 2018 leading to live product trials at scale in autumn 2018.

Commerce
Mimica has issued its first invoice – to Arla.

Prototypes
Product design firm Morrama has developed fully-realised prototypes for the consumer acceptance trials.

Brand
Mimica Lab recently won a place in the prestigious accelerator run by US agency R/GA in London and through this programme we are currently preparing the final details of branding and consumer messaging for the Arla trials.

Awards
Mimica and founder Solveiga Pakstaite have won many awards such as MIT’s Inventor of the Year, the James Dyson Award, Mayor of London’s Low Carbon Entrepreneur, and Shell Smarter Future Award. Participant in UK’s Climate-KIC accelerator and the Central Research Laboratory Programme and has secured two grants from Innovate UK.

The Investment Opportunity
Mimica is currently raising a £700,000 seed round on a pre-money valuation of £2.5m. Of that total, we have taken £270,000 in investment to date, with £530,000 of equity remaining, which we anticipate being sold within the next month or so. This capital will take the company through full commercial trials in Q3/4 2018. On the basis of trial data proving profitability, we will raise a Series A round towards the end of the year.

Contact Information
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Company Linkedin: https://www.linkedin.com/company/11148424
MIP Diagnostics is the leading provider of nanoMIPs, or ‘plastic antibodies’, which have enormous potential in many fields including healthcare and environmental diagnostics as well as bioprocessing and even oil production.

The Problem
Molecular recognition is at the heart of much of science and typically relies on antibodies, making them ubiquitous in life science research, with applications in diagnostics, sensing, assays, detection and separation. Yet, antibodies have many disadvantages that researchers must try to work around – the need for a cold chain, instability, cost and timescale of development and use of animals in production.

The Solution
NanoMIPs, sometimes called ‘plastic antibodies’ are an alternative that are chemically synthesised, cost effective and quick to develop and manufacture. They are stable for years and can tolerate extreme physical conditions which would defeat any biomolecule including antibodies.

Traction & Achievements
In just over two years since launch, the company has secured business with a multiple global blue-chip clients, and has already gained repeat business. Clients are working with MIP Diagnostics in a range of application areas, from virus identification to diagnostic kits and bioanalysis, and including applications in the petrochemical industry that would be far beyond the scope of antibodies. The company’s technology is protected by a strong IP portfolio and is unique in the market in being applicable to a broad range of targets, further enhancing its’ diversity of application. In addition to the revenue generating custom service business we are also developing high value nanoMIP solutions for recognised market needs which we will license out in due course. We have built a strong executive management team and have won multiple awards for both our technology and our business.

The Investment Opportunity
We are currently seeking to complete our Series A investment round of £1.5M of which £1.3M has already been secured. The investment is required to support an expansion of the laboratory and business development teams, establishing new laboratories to house them and to develop the licensable products. As this investment will enable us to reach our out-license milestone it will also underpin a further expansion through a Series B round in late 2019.

Contact Information
Company Twitter: @mip-dx
Company Linkedin: https://www.linkedin.com/company/10842168/
Company Website: www.mip-dx.com
Nova Extraction has built a unique way to extract ingredients from plants right in the field. Their equipment is offered as a service and provides the most advanced extraction method to the fastest growing market segment: SMEs.

The Problem
The majority of the high-value ingredients market is still using the same extraction method as was used by ancient Egyptians. It requires extensive boiling of plants in vast amounts of fresh water, in the process the heat destroys the scent. Some use chemical solvents, like hexane, which are flammable, toxic and harmful for the environment. The most advanced method is to use compressed carbon dioxide (CO₂) as a solvent, which is safe and gives high quality products but because of equipment cost and complexity, it is only being used by a few large corporations.

The market for high-value flavours and fragrances is growing (£26bn with 7% annual growth) and so too is the demand for natural ingredients with a transparent origin. Indeed, the number of niche perfume makers quadrupled in the last 10 years with the focus on personalised, natural and exotic aromas. This growth has driven a strong need for a technology that can:
- Produce high quality ingredients without traces of harmful solvents.
- Be flexible in the feedstock choice and allow experimenting with various products.
- Be available to a wide range of larger and smaller companies.

The Solution
Designed and built using proprietary engineering solutions, Nova Extraction has created a new state-of-the-art mobile CO₂ extraction technology. The equipment can work off the grid, enabling it to travel from farm to farm and be easily deployed on client’s land and process their plants into high value ingredients in situ.

For smaller clients, our innovative ‘Equipment as a Service’ business model provides cash flow friendly access to high-tech, while larger clients benefit from agility, flexibility and consistency across their supply chains.

Traction & Achievements
Technology
Two prototypes are built and operational. In-house capacity to fabricate proprietary equipment. Engaged with German compliance company, TUV, to meet EU directives and get CE marking.

Market
Started securing partners in the UK for field tests in 2019: Herbs Unlimited and Neoils.
Companies from UK, Spain, Slovakia, Czech Republic and Tanzania requested demos of our equipment for such materials like vanilla, coffee and cocoa shells, banana skins, hemp and coffee waste.
Received interest from the leaders in ingredients market: Givaudan and IFF (together comprising 32% of global market).

Funding
Founders spent c£100k since 2008.
Recently raised £50k in grant funding from EU accelerator Climate KIC.

The Investment Opportunity
We are seeking a seed round of £320k (SEIS/EIS eligible) by end of Q2 2018. It will be used for construction of the pilot and performing field tests in UK and EU with completion by end of Q3 2019.
To scale up, an additional £400k will be raised either in debt or equity in Q3-Q4 2020. Pre-money valuation estimated as £2.5m.
SugaROx produces first-in-class chemical stimulants that increase crop yield much more than current methods and in line with global food demand. The compounds also have utility in stress resilience, screening for new yield genes, controlling flowering and improving pesticide effectiveness.

The Problem
Crop yields must double in the next 35 years to meet projected global food demand. However, annual yield improvements of major crops are increasing below the rate required. For wheat, for example, annual increases of only 0.9% are being achieved. Any technology that can break through the current rate of increase in crop yield towards meeting global demand is extremely attractive.

The Solution
Trehalose-6-phosphate (T6P) is a pivotal signalling molecule essential for regulation of plant growth. We have pioneered a method using T6P precursors to enable targeted increase in T6P to elevate starch synthesis and increase photosynthetic rate. Our compounds are UV-light-cleavable for controlled release of T6P.

T6P precursors also stimulate growth recovery after drought, combining yield increases with resilience, which is difficult through breeding. T6P precursors also allow control of specific processes, such as flowering time, and screening for genetic variation in processes that determine yield.

A glass-house trial conducted on wheat showed increased grain size and yield per plant by up to 20%. This trial was published in Nature. A large-scale field trial is in progress and will form the basis for regulatory approval.

Traction & Achievements
SugaROx is built on technology funded by a £650k BBSRC grant and in April 2018 we will hear about further funding for over £1.5m.

A patent on the T6P compound for yield enhancement has been granted in the US, China, Germany, Spain, Poland, Portugal, France, Italy and the United Kingdom. Patent applications for drought resistance and floral development have been filed.

Following the Nature publication, we received significant interest from several companies in securing samples of our compounds. It is likely that some of these leads will translate into our first sales. Conversations are also ongoing with large charitable foundations regarding the application of our compounds in the developing world. Such endeavours would strengthen the reputation of SugaROx. We have also begun discussions with several potential investors, both UK and overseas, who have shown significant interest.

The Investment Opportunity
The primary aim of SugaROx is to develop and distribute our proprietary biostimulants for use in a wide range of crops worldwide. The global market for crop biostimulants was $2 billion in 2017 and expected to reach $3 billion by 2022. The SugaROx compounds also have a range of other crop improvement applications, all offering greater opportunity to the investor.

Total investment sought £1,750,000

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<thead>
<tr>
<th>Investment required for:</th>
<th>Outcomes:</th>
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<tr>
<td>Scale-up and optimisation of T6P synthesis</td>
<td>£450,000 Production at kg scale</td>
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<tr>
<td>Demonstrate activity in wheat field trials</td>
<td>£600,000 Aiming for less than 10g/ha at £1/g</td>
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<tr>
<td>Greenhouse trials on other crops</td>
<td>£400,000 Expansion of market</td>
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<td>Toxicology tests</td>
<td>£300,000 Regulatory approval</td>
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The Problem

THE UNSEEN visualises and communicates complex unseen data that typically cannot be seen through the traditional senses such as eyes, ears, nose.

To date, there have been multiple challenges that have hindered the ability to visualise data through the use of colour from chemical stability, longevity, integration issues through to mass manufacture and scale-up difficulties around process and cost.

The Solution

We push the boundaries of what can be visualised intelligently in the world around us (e.g. a bandage that indicates level of infection through colour; a headpiece that can visualise brain activity through colour). Visualising data using chemistry in simple intuitive ways that are applied directly onto materials in the form of coatings, compounds and colourants and that can respond in real time.

Triggers include, heat, UV, pressure, moisture, pollution, chemicals and electric signals.

We believe there are very few similar initiatives today that are attempting to advance the development of chromic material and blend art/design, science and technology together under one roof.

Traction & Achievements

Output generated by THE UNSEEN typically cover the following:

- Advancement in the scientific understanding of chromic technology and its ability to be used intelligently in reimagined or brand-new products and services
- Increased revenue performance for our clients through the development of technology integrated into disruptive products for global distribution
- Supercharged PR for ourselves and our clients (e.g. 70m+ social media views of our colour change hair technology)
- We have been fortunate enough to present some of our recent work at the White House for the UN Summit on Climate Change

The Investment Opportunity

To date we have been highly capital efficient and self-sufficient based upon the client contracts we currently have in place. We are seeking additional investment of around £500,000 to support growth activities, namely, expansion and accelerated development of our chromic technologies in order to expand into new markets (e.g. automotive). Investment will predominantly be used on growing our creative and material science team to successfully develop the technology to a point of maturity and to enter into a R&D and technology licensing deal with a number of multinational clients.
Venue hire at Burlington House

Scientific heritage, contemporary facilities, and fine dining with a visual kick that can’t fail to impress. Plan your event at our home in Piccadilly, London

Find out more
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or email venuehire@rsc.org