

Annual Report 2024

INFECTIOUS
INNOVATION
CONSORTIUM

SAVING LIVES
BY SUPPORTING
INNOVATION

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Director's Foreword



As we mark the fourth anniversary of the Infection Innovation consortium (iiCON), it is an opportune moment to reflect, celebrate our achievements, and reaffirm our commitment to innovation in infection research and development. This past year

is testament to the resilience and dedication of our team, our partners, and the broader community as we continue to navigate the complexities of infectious diseases.

With the appointment of Stephen Gordon as our new Director of Experimental Medicine, expansion of our clinical trials facilities in Liverpool to include in patient Human Challenge trials and establishing our first human challenge vaccine trial in Malawi funded by the MRC, we are extending the range and complexity of trials that can be undertaken. Stephen brings a network of global partnerships that will be pivotal in shaping our long-term infection R&D strategy.

Aligned to increased use of automation, machine learning and AI in infection R&D, we have expanded our team to include specialist engineers. Professor Patryk Kot and Dr. Mike Egan have joined us as Senior Business Development Managers. They are helping to deliver a pioneering £20M programme to establish a Category 3, AI-driven robotic facility that aims to move our human organoid platform from low to medium throughput while improving the reproducibility of the data generated and the complexity of experimental work that can be undertaken. This facility will pave the way for more streamlined development of novel therapeutics, reinforcing our position as a leader in infection R&D.

Earlier this year we ran a new £1.5M programme for UKRI supporting networks and pilot grants for disruptive technologies to allow us to tackle infections. Sandpit events were held in Liverpool and London, which attracted over 200 multi-disciplinary stakeholders to scope out the call for proposals and foster new linkages. The call for proposals attracted interest from across the UK with 88 eligible applications, 11 of which have been offered awards.

As an integral part of the Liverpool City Region Innovation Investment Week, we co-hosted a Dragons' Den style pitching event with Lyva Labs that put innovative local businesses in front of national VC, Angel and Series A funders. Regional innovators showcased their groundbreaking ideas, demonstrating the wealth of talent and creativity within our community. The engagement from investors and subsequent deal flows that have resulted from this, highlighted the growing local ecosystem in the infection R&D landscape.

This year marked the 10th anniversary of the O'Neill Review on antimicrobial resistance (AMR), a pivotal moment in the recognition of the global threat that AMR poses. We commemorated this at the Bioinfect AMR conference, jointly sponsored by BioNow and iiCON. We were joined

by Lord Jim O'Neill, the author of the seminal report, and Liverpool City Region Mayor Steve Rotheram, to celebrate the significant breakthroughs in the fight against AMR alongside the major challenges that remain.

In a significant expansion of our capabilities, we welcomed the Centre of Excellence for Long-Acting Therapeutics (CELT) as our 11th platform in March. This new platform enhances our ability to provide access to world-class expertise in the formulation of long-acting therapeutics, driving innovation and improving therapeutic efficacy. We are delighted to announce that CELT has been recognised as a National Centre with funding from UKRI.

Embedded as we are in one of the most deprived areas of the UK, it is important that iiCON's activities improve the health outcomes of our local community. Our commitment to community engagement is exemplified through our support of the ReCITE initiative, led by the Liverpool School of Tropical Medicine (LSTM). By addressing misinformation through storytelling, ReCITE has built trust in different health interventions within local communities. Our initial work in Liverpool City has now expanded to six adjacent local authorities. Our collaborative Health Equity Liverpool Project (HELP) has been shortlisted for a prestigious HSJ award, recognising its outstanding contribution to addressing local health inequalities.

Our outreach efforts extend to the next generation of innovators. Through our own internal iiCON Schools project and the KQ Liverpool Future Innovators Programme, we welcomed pupils from local schools into our labs, providing them with hands-on experiences in scientific research. The aim is to inspire and empower young minds, cultivating a vision of future leaders in the field of health and innovation and seeding ideas of careers they might pursue locally in science and technology.

As we conclude another successful year, it is evident that iiCON over a short period of time has established and strengthened its connections with diverse organisations across the globe. We have engaged with 1,009 organisations worldwide, helping to develop a dynamic ecosystem that enhances collaboration and accelerates progress in infection research and development globally.

In closing, I would like to thank our dedicated team, partners, and stakeholders. Together, we are driving the future of infection R&D and making a meaningful impact on global health. As we look ahead, we will continue to push the boundaries of innovation and collaboration, with our commitment to save lives by increasing the speed and reducing the cost of bringing effective new infection therapeutics to market.

Professor Janet Hemingway, CBE FRS
iiCON Founding Director

iiCON Overview

A LEADING GLOBAL CENTRE FOR INFECTIOUS DISEASE R&D, iiCON BRINGS TOGETHER **INDUSTRY, ACADEMIA, AND THE NHS** IN A COLLABORATIVE PROGRAMME.



DECADES OF UNDER-INVESTMENT IN NEW THERAPEUTICS AND DIAGNOSTICS MEANS THE WORLD IS ILL-EQUIPPED TO RESPOND TO THE BURGEONING CHALLENGE POSED BY INFECTIOUS DISEASES, ANTIBIOTIC RESISTANCE, AND EMERGING PANDEMICS.

About The Programme

Decades of under-investment in new therapeutics and diagnostics means the world is ill-equipped to respond to the burgeoning challenge posed by infectious diseases, antibiotic resistance, and emerging pandemics.

In response to this challenge, iiCON bridges the gap in the infection innovation ecosystem. A leading global centre for infectious disease R&D based within the North West of England, it brings together industry, academia, and the NHS in a collaborative effort with a clear aim: to save lives globally by accelerating the discovery and development of innovative new treatments, diagnostics, and preventative products for infectious diseases.

iiCON has an exceptional skill base, an understanding of and access to the disruptive technologies needed to bolster the Infectious Disease Therapeutics pipeline, and networks with local, national, and international stakeholders.

The consortium has access to patient populations (and pathways for drug and diagnostic evaluation and implementation) in the UK and across Africa, Asia and the Americas. It also offers access to the people, skills and supply-chains to support the journey from drug discovery through to manufacturing and deployment.

A Dynamic Ecosystem

iiCON comprises leading UK organisations focused on infectious disease R&D, including Liverpool School of Tropical Medicine, LifeArc, Liverpool University Hospitals NHS Foundation Trust, Unilever UK, the University of Liverpool, Evotec, and Inflex Therapeutics as part of a c£222.3 million programme.

The combined infectious diseases, antibiotic and hygiene R&D portfolio of iiCON's seven partners is highly complementary and covers the full spectrum of product discovery, development, manufacture, marketing and impact assessment – representing a concentration of expertise not replicated anywhere else in the UK.



iiCON FORGES LONG-TERM COLLABORATIVE RELATIONSHIPS WITH THESE ORGANISATIONS, AND FACILITATES IMPACTFUL PARTNERSHIPS THAT ACCELERATE AND ENABLE INNOVATIVE RESEARCH AND PRODUCT DEVELOPMENT. THIS HELPS TO BRING THE NEXT GENERATION OF GAME-CHANGING NEW PRODUCTS TO MARKET MORE QUICKLY, SAFELY, AND AFFORDABLY.

iiCON is part of a dynamic, £2 billion infection R&D ecosystem across the Liverpool City Region, Cheshire and Warrington. With world-leading capabilities in drug discovery, diagnostics and clinical trials, all the way through to biopharmaceutical manufacturing, the North West represents one of the largest biopharmaceutical manufacturing clusters in Europe.

Collaborative Innovation

Operating across 11 commercially sustainable specialist research platforms, iiCON's collaborative effort is directly reducing the global burden of infectious disease with a co-ordinated initiative to address key roadblocks in global R&D pipelines and strengthen and regenerate the global anti-infectives supply chain.

The consortium proactively identifies and engages with the most innovative companies working in the sector globally. iiCON forges long-term collaborative relationships with these organisations, and facilitates impactful partnerships that accelerate and enable innovative research and product development. This helps to bring the next generation of game-changing new products to market more quickly, safely, and affordably.

Industry Recognition

The impact that iiCON has had on the health and life sciences sector is exemplified by the prestigious awards the consortium and its staff have been presented with since its founding. This includes iiCON's Founding Director Janet Hemingway receiving both the Wigglesworth Memorial Award for outstanding services to the science of Entomology and BioNow's Outstanding Contribution Award, which recognises excellence in North England's biomedical, pharma and life sciences sectors. Professor Hemingway was also named Liverpool City Region Leader of the Year at the 2023 Northern Leadership Awards. She was also hailed as Overall Leader of the Year 2023.

Dr Shaun Pennington, an immunologist and microbiologist working on iiCON's Organoid Models platform, was the recipient of the ECP Impact Award at Drug Discovery 2022, which celebrates early career professionals making a clear impact on the wider scientific community. While the iiCON-supported Liverpool Vaccine Equity Project won a Building Collaborative Communities Award at the Smarter Working Live Awards, 2023, which celebrate innovation, collaboration, and excellence in the public sector.



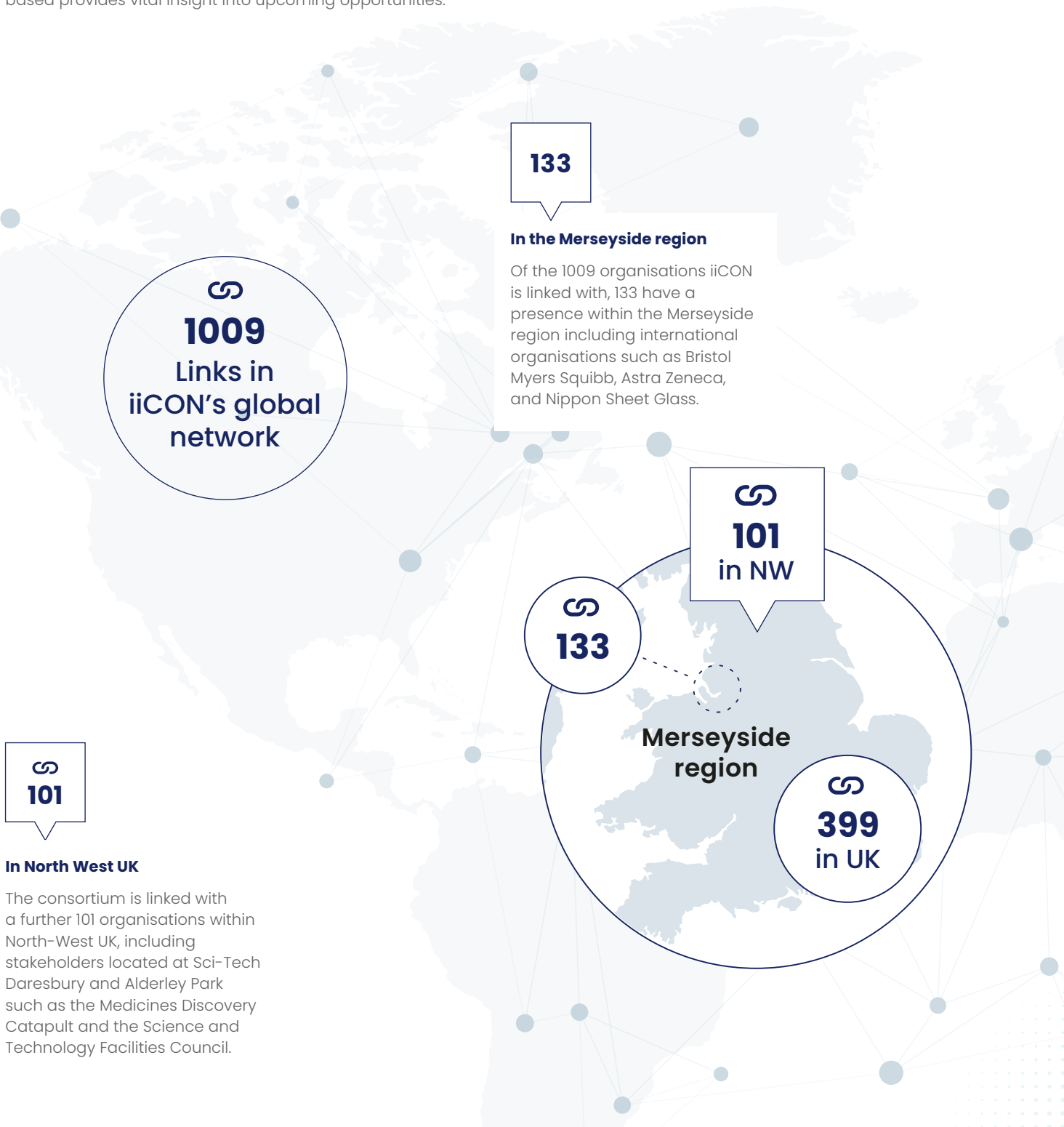
iiCON Network

Overview

iiCON pays close attention to the infection research and development (R&D) network trends globally. Monitoring the key players, tracking who is moving into the space, and where organisations are based provides vital insight into upcoming opportunities.

At a glance

iiCON has access to a diverse and expansive global network ranging from environmental management consultants in Namibia to multi-national pharmaceutical and agrochemical companies, making it well positioned to make a substantial worldwide impact in the infection space.



OVERALL, iiCON HAS BEEN SUCCESSFUL IN **ESTABLISHING AND STRENGTHENING LINKS** WITH ALL ORGANISATION TYPES PLAYING AN **ACTIVE ROLE** IN INFECTION R&D.

Size of organisations engaged with

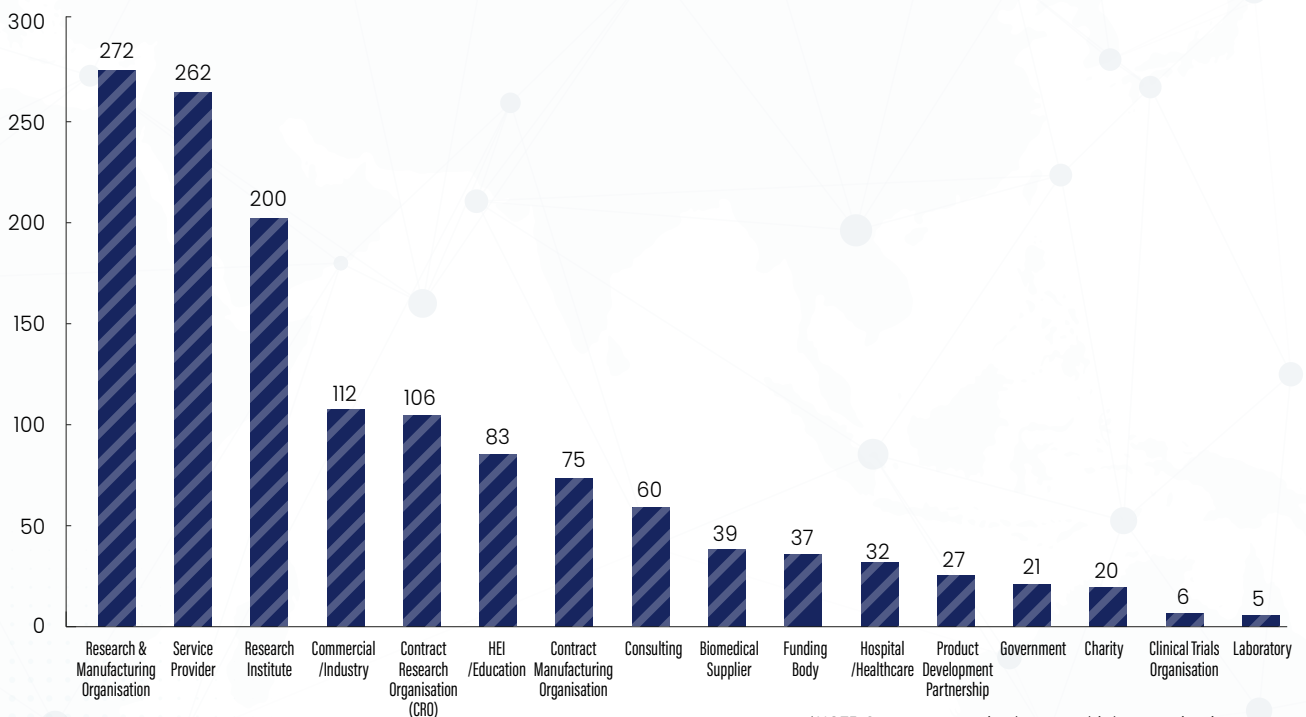


376

Global connections

On a global scale, iiCON is linked with 376 organisations across Europe (not including the UK), Asia, Africa and the Americas. Notable companies include BASF, Against Malaria Foundation, Bill and Melinda Gates Foundation, Sanofi, and Pfizer.

iiCON Impact – Organisation Type*



*NOTE: Some companies have multiple organisation types

Partners

LED BY THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE, iICON BRINGS TOGETHER LEADING UK ORGANISATIONS FOCUSED ON INFECTIOUS DISEASE R&D, INCLUDING LIVERPOOL UNIVERSITY HOSPITALS NHS FOUNDATION TRUST, LIFEARC, UNILEVER UK, THE UNIVERSITY OF LIVERPOOL, EVOTEC AND INFEX THERAPEUTICS.



The combined infectious diseases, antibiotic and hygiene R&D portfolio of our seven partners currently exceeds £2 billion. The expertise of each partner is highly complementary and covers the full spectrum of product discovery, development, manufacture, marketing and impact assessment – representing a concentration of expertise not replicated anywhere else in the UK.

LSTM

iICON lead Liverpool School of Tropical Medicine (LSTM) is a world leader in the discovery and early development of drug, diagnostic and public health insecticide therapeutics. The first institution in the world dedicated to research and teaching in the field of tropical medicine, it has a long history of successful product development with multiple commercial partners and has spun out four companies over the last decade. LSTM's work in combating diseases such as TB, HIV/AIDS, malaria, dengue and lymphatic filariasis is supported by a research portfolio of over £600m, which includes 30 industrial collaborations, one major Product Development Partnership (IVCC), and a shared Phase 1 Clinical trials unit with Liverpool University Hospital Foundation Trust and The University of Liverpool. LSTM has an extensive track record of establishing public-private partnerships and is working with major organisations in infection including the World Health Organization, the Department for International Development, and The Bill & Melinda Gates Foundation. Its worldwide reputation and the calibre of its research outputs has secured funding to lead over 10 international consortia and product development partnerships aimed at reducing or eliminating the impact of diseases upon the world's poorest people. Its state-of-the-art facilities continue to develop new drugs, vaccines and pesticides which puts LSTM at the forefront of infectious disease research.

Liverpool University Hospitals NHS Foundation Trust (LUHFT)

Liverpool University Hospitals NHS Foundation Trust (LUHFT) runs Aintree University Hospital, Broadgreen Hospital, Liverpool University Dental Hospital and the Royal

Liverpool University Hospital. Bringing together a combined workforce of over 12,000 staff, the Trust serves a core population of around 630,000 people as well as providing a range of highly specialist services to a catchment area of more than two million people in the North West region and beyond. It has an annual turnover of more than £1billion.

The NIHR Royal Liverpool and Broadgreen Clinical Research Facility (CRF) opened in 2009 and is embedded within the Royal Liverpool University Hospital. It has been MHRA Phase 1 Accredited since 2013. The CRF consists of 12 beds and is primarily designed to support and conduct early phase academic and commercial clinical trials in patients and healthy volunteers across a wide variety of disease areas, including infection and most recently, COVID-19. The Liverpool Life Sciences Accelerator is a collaboration between the Trust and Liverpool School of Tropical Medicine (LSTM). This co-locates Life Sciences companies which support the NHS research agenda, with LSTM and the Trust, and provides patient access to the latest healthcare innovations.

As an iICON partner, LUHFT facilitates collaboration and partnership working between clinical, research, and industry partners in a clinical setting. This supports the development of innovative novel therapeutics and diagnostics through access to world-class expertise and facilities, particularly high-quality first-into-human clinical trials.

Unilever

Unilever is one of the world's largest consumer goods companies, known for famous brands and driven by the purpose to make sustainable living commonplace. Unilever invests €800 million into innovation every year to enable their global team of 5,000 R&D experts to make new breakthroughs for everyday products that care for the planet and improve people's health, confidence and wellbeing.

As part of iICON, Unilever's R&D teams study health and hygiene, and how to prevent the transmission

of infectious diseases. The scientific discoveries in this space translate into new innovations in consumer products, benefitting millions of people around the world. This research collaboration between iiCON and Unilever has already yielded success in rapidly confirming the positive performance of mouthwashes against SARS-CoV-2 and sharing these results with consumers and professionals, with the ongoing research pipeline promising further discoveries.

Infex Therapeutics

Infex Therapeutics is a clinical-stage specialist translational development SME focused on WHO critical priority drug-resistant pathogens. Infex acquires, develops, and licenses innovative new antibiotic, antiviral, and antifungal programmes, with UK and international SMEs, universities, and pharma companies. Its mission is to ensure that all new, novel and needed drugs can get to market in the shortest possible time. It has agreements with UK, Swedish, US, EU, and Japanese partners to bring drug programmes into clinical trials in partnership with the NHS in Liverpool. Infex will capture significant long-term value from future commercial sales around the world.

Evotec

Evotec is a life science company with a unique business model to discover and develop highly effective therapeutics and make them available to patients. The company's multimodality platform comprises a unique combination of innovative technologies, data and science for the discovery, development, and production of first-in-class and best-in-class pharmaceutical products. Evotec utilises this "Data-driven R&D Autobahn to Cures" for proprietary projects and within a network of partners including all Top 20 Pharma and over 800 biotechnology companies, academic institutions, as well as other healthcare stakeholders. Evotec has strategic activities in a broad range of currently underserved therapeutic areas, including neurology, women's health, as well as metabolic and infectious diseases.

Evotec is committed to meeting patient needs in the field of infectious diseases and with partners, is advancing a broad portfolio of programmes targeting key pathogens in the areas of virology, mycology and antibacterials. In addition to these strategic activities, Evotec provides bespoke research and development solutions in the anti-infective disease area ranging from target identification to investigational new drug ("IND") applications, with an established leading-edge platform enabling the discovery and development of new therapies and therapeutic approaches to treat and prevent serious and life-threatening infections in multiple classes of anti-infective agent including small molecules, natural products, peptides, antibodies, other biologics and vaccines.

In September 2020 Evotec joined iiCON as a co-founding member, bringing with it extensive expertise reaching far beyond conventional antimicrobial agents, into alternative modalities such as targeting virulent attributes, specific pathogen antibodies, combination therapies, antimicrobial

peptides and phage technologies. In addition, Evotec adds a highly successful track record in collaborative funding applications in both Europe and US.

The University of Liverpool

The University of Liverpool is one of the UK's leading research institutions and a centre of world-class teaching and learning. A member of the prestigious Russell Group of the UK's leading research universities, Liverpool has over 5,600 staff and an annual turnover of over £583.5 million.

The university is globally recognised for its research in health and life sciences, science and engineering, and humanities and social sciences. Its interdisciplinary research centres include the National Centre for Zoonosis Research and the Stephenson Institute for Renewable Energy.

As an iiCON partner, The University of Liverpool supports and enables industry innovation with state-of-the-art infrastructure and expertise for the development of new experimental models of infection, antimicrobial drug development, and construction of comprehensive pharmacokinetic-pharmacodynamic (PK-PD) packages that are required data packages for new drug registrations.

The University's Materials Innovation Factory is a joint venture co-developed with Unilever. The Open Innovation Hub for Antimicrobial Surfaces, with multiple commercial contracts, is already recognised as a major driver of surface science and biofilm technology within the UK and brings unique formulation capacity to the Consortium.

The University also supports access to advanced nanotherapeutics expertise through The Nanotherapeutics Hub (NTH) at the Centre of Excellence for Long-acting Therapeutics (CELT).

LifeArc

LifeArc is a self-funded, medical research organisation and charity committed to investing in areas of high unmet medical need. The teams are experts in drug and diagnostics discovery, technology transfer, and intellectual property focused on translational science – bridging the gap between academic research and clinical development. LifeArc provide funding, research and expert knowledge, all with a clear and unwavering commitment to having a positive impact on patient lives. They have been doing this for more than 25 years and their work has played a role in five licensed medicines, including cancer drug pembrolizumab (Keytruda®), and a diagnostic for antibiotic resistance. LifeArc is embarking on a global health strategy that aims to accelerate the progression of affordable and accessible solutions, which can help understand, prevent and treat infectious diseases around the world.

A Word From Our Partners

Unilever PLC: Innovating for future bioactives



DR JONATHAN HAGUE,
HEAD OF CLEAN FUTURE SCIENCE AND TECHNOLOGY
FOR UNILEVER HOMECARE



DR SAMANTHA SAMARAS,
GLOBAL SENIOR VICE PRESIDENT SCIENCE & TECHNOLOGY
BEAUTY & WELLBEING AND PERSONAL CARE R&D UNILEVER

Unilever is a world leading consumer products company spanning homecare, beauty and wellbeing, personal care, nutrition and ice cream. In 2023 the company delivered a turnover of €59.6Bn, employing 128,000 people globally to deliver new product innovations to the over 3.4 billion people who use our products every day.

Biological sciences research is critical for Unilever’s ability to deliver effective, innovative, safe and sustainable products right across its global portfolio, be that through the development of new antimicrobials for improved home hygiene, more effective toothpastes, soap bars or deodorants or microbiome technologies for skin and scalp care.

This can only be achieved through strategic partnerships with world leading academic experts and institutions and through Unilever’s commitment to supporting biological research in the UK and in Liverpool City Region.

Unilever has five main strategic partnerships within the North West Biosciences Ecosystem; iiCON/LSTM for Global Health and natural antimicrobials, the Microbiome Innovation Centre, the National Biofilm Innovation Centre and the Materials Innovation Factory with the University of

Liverpool, respectively for microbiome technology, biofilm research / innovation and biosciences automation and with the Hartree National Centre for Digital Innovation for the application of Machine Learning to biological data.

Our partnership with LSTM and the iiCON consortium is an important driver of innovation, impacting multiple capabilities and levels of technology readiness.

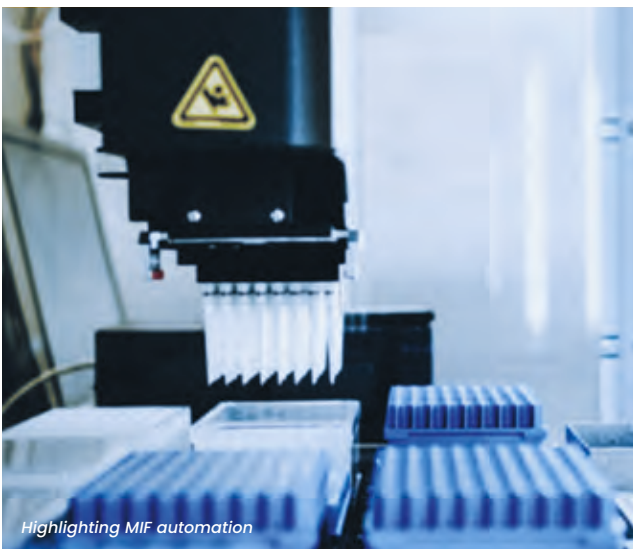


THE PARTNERSHIP HAS ALSO BEEN CRITICAL TO OUR ABILITY TO DEVELOP METHODOLOGIES AND EVALUATE PRODUCT EFFICACY IN RESPONSE TO THE GLOBAL HEALTH EMERGENCIES SUCH AS THE SARS-COV-2 PANDEMIC AND TO DEVELOP INNOVATIVE APPROACHES TO BETTER UNDERSTAND HOW LABORATORY EFFICACY TRANSLATES INTO REAL WORLD COMMUNITY HEALTH BENEFITS.

In early stage research the partnership is helping to drive the identification of sustainable natural antimicrobials, with over 30,000 samples having been screened with iiCON/LSTM and over 500,000 tests conducted using the advanced leading edge automated microbiology platforms available at the Materials Innovation Factory and established in partnership between Unilever and the University of Liverpool.

The partnership has also been critical to our ability to develop methodologies and evaluate product efficacy in response to the global health emergencies such as the SARS-Cov-2 pandemic and to develop innovative approaches to better understand how laboratory efficacy translates into real world community health benefits.

Unilever is committed to developing innovative hygiene products which are safe, effective, sustainable and affordable and which bring benefits to consumers across the world. Partnerships such as our collaboration with iiCON are critical achieving that goal.



Highlighting MIF automation

Liverpool City Region Combined Authority: Supporting innovation



JOHN WHALING,
LEAD OFFICER, INNOVATION & COMMERCIALISATION

Another year, another annual report highlighting fantastic multi-dimensional success regarding the ongoing delivery of iiCON, which in terms of both investment leverage and real world impact is the undoubted poster child not only of the UK Strength in Places programme but possibly for UKRI-supported projects as a whole!

The Liverpool City Region (LCR) has been “doing” place-based innovation for 11 years and is arguably at the UK forefront. What we mean by this is concerted, evidence-based, partnership-driven, cross-ecosystem approaches to maximise distinctive world-leading science and technology assets/capabilities in order to drive UK and regional investment, productivity and growth PLUS solve local challenges.



THROUGH FOUNDER AND DIRECTOR PROF. JANET HEMINGWAY, iiCON PLAYS A DYNAMIC INTEGRAL ROLE IN LCR INNOVATION GOVERNANCE, LOBBYING AND EXTERNAL RELATIONS, INCLUDING OUR BURGEONING PARTNERSHIPS WITH INNOVATE UK AND THE ROYAL SOCIETY.

The reason for highlighting this is that iiCON, anchored at the Liverpool School of Tropical Medicine (LSTM), is also the prime exemplar of #LCRInnovation in every regard. The figures outlined in this report bear testament to its global reach and impact, working with businesses, governments and communities internationally. In tandem, the Knowledge Excellence Framework results just published (September 2024) show further improvement on LSTM’s already excellent performance, including for the first time the highest possible rating in how the university supports local growth and regeneration, and directly linked to iiCON.

Thus iiCON is at the heart of realising the LCR’s life sciences-focused Investment Zone, formally launched earlier this year during the City Region’s inaugural Innovation Investment Week, that iiCON was also instrumental in developing, notably via a novel VC pitching event and high profile innovation investment summit. Equally, through Founder and Director Prof. Janet Hemingway, iiCON plays a dynamic integral role in LCR innovation governance, lobbying and external relations, including our burgeoning partnerships with Innovate UK and The Royal Society.

Last but not least, iiCON is not only nucleating a potential UK infection innovation “super cluster” in its own right, but also something we are using as a “repeatable model” regionally to help scale out other innovation assets into sustainable growth clusters as part of the LCR’s pioneering asset-based cluster development (ABCD) approach.

In place-based innovation terms iiCON is as good as it gets, and here’s to another extraordinary year plus sustained success and support!



Our Platforms

OPERATING ACROSS iICON'S 11 OPEN-ACCESS SPECIALIST RESEARCH PLATFORMS, WE REMOVE BARRIERS TO MARKET BY PROVIDING COMPANIES ACCESS TO WORLD-LEADING RESEARCH EXPERTISE, MARKET INTELLIGENCE, AND CUTTING-EDGE FACILITIES. THIS SUPPORTS EVERY STAGE OF THE DISCOVERY JOURNEY FROM DISCOVERY TO ADOPTION.

01

Discovery

Our early-stage-discovery platforms offer sophisticated expertise & facilities to support world-leading innovation. This knowledge & capability enables the discovery of innovative diagnostics & antimicrobials, bringing forward transformative novel candidates to combat global challenges including multi-drug resistance.



02

Translation

Our Translation platforms support the development of novel antimicrobials & diagnostics. Specialist support is available to progress novel therapeutics from hits to leads. Highly innovative technologies including nanotherapeutics, innovative humanised tissue & microfluidic models, including organoid systems & Organ-on-a-Chip are accessible to industry to fast-track drug discovery. New drug development pathways are being developed to support the industry effort to combat multi-drug-resistant superbugs.



03

Evaluation

World-class facilities & expertise support product evaluation & validation. Our expertise in Human Challenge trials offers industry co-located research & clinical facilities, with impactful first-in-human trials run by world-leading researchers available for all antimicrobial applications, significantly de-risking the transition into humans. Our platforms also offer validation & verification of non-invasive diagnostics & advanced surface science capability from leading research institutions.



04

Adoption

Our Adoption platforms shape & inform global health policy and support market access, helping to protect communities from diseases including Malaria. Our experts also work closely with industry & policy makers to position health interventions & products to enable maximum public health benefit.



Supporting Innovation

iiCON provides access to 11 commercially sustainable specialist research platforms, co-developed and operated by our industrial, academic, and clinical partners.

These specialist platforms provide industry with world-leading research capability and facilities - enabling access to resources and expertise that can transform the product discovery and development journey.

Our open-access platforms bridge the gap in the infection innovation ecosystem to support co-innovation and accelerate the product journey from concept to deployment.

Companies from early-stage start-ups to industry giants have leveraged the expertise and facilities available through the platforms in their discovery and development journeys.

We work with companies at all stages of the innovation journey - from very early-stage conceptual work, through to clinical trials, manufacturing, and market positioning, helping to fast-track new products and treatments to patients and communities.



iiCON's eleven specialist platforms

- PLATFORM 1** Bioactives Library
- PLATFORM 2** Hits to Leads
- PLATFORM 3** Organoid Models
- PLATFORM 4** Advanced PK-PD AMR Modelling
- PLATFORM 5** Human Challenge
- PLATFORM 6** Diagnostics
- PLATFORM 7** Randomised Control Trials
- PLATFORM 8** Mapping and Modelling
- PLATFORM 9** Nanotherapeutics
- PLATFORM 10** Antibody Humanisation
- PLATFORM 11** Long-Acting Therapeutics

Platform Details

1

Bioactives Library

PLATFORM PARTNER: Liverpool School of Tropical Medicine
PLATFORM LEAD: Dr Adam Roberts, Reader and AMR Lead, LSTM

Designed to drive innovation and support companies of all sizes on the discovery journey, this platform offers industry early access to one of the world's largest and most diverse, and completely novel Bioactives Libraries, developed by the Liverpool School of Tropical Medicine. This vast, untapped pool of thousands of environmental, bacterial, and fungal isolates has the potential to shape the next generation of transformative novel antimicrobial products and therapies. The library is designed in a modular format to improve usability and increase efficiency. This enables a targeted approach, where specific isolate groups can be screened quickly and cost-efficiently. World-class end-to-end expertise and after-care from the expert team at LSTM ensures companies are supported at every stage of the discovery journey. Expert antimicrobial product development support, validation, and consultancy is also available to industry partners at the early stage of the product development journey.

2

Hits to Leads

PLATFORM PARTNER: Infex Therapeutics
PLATFORM LEAD: Dr Derek Lindsay, COO, Infex Therapeutics

Speeding up the response to pandemics and creating new treatments to tackle the increasing global threat of drug resistance are the main focus areas in Platform Two. The work is led by Infex Therapeutics and provides a subsidised, cost-effective mechanism to accelerate the progress of novel therapies. Infex, based at Alderley Park in Cheshire, has a range of projects in advanced stages of development. Its lead clinical candidate is RESP-X, a Phase 2 novel humanised monoclonal antibody. RESP-X is designed to help the body tackle *Pseudomonas aeruginosa* (Pa) infection, a hard-to-treat drug-resistant pathogen which causes chronic and debilitating respiratory disease. No approved treatments currently exist. RESP-X does not kill the bacteria directly but deactivates one of its critical mechanisms, enabling the immune system to clear the infection. The iiCON-backed project has progressed to a Phase 2a clinical trial in healthy volunteers, which are being conducted by another iiCON partner, National Institute for Health and Care Research Liverpool and Broadgreen Clinical Research Facility, part of the Liverpool University Foundation Hospital Trust.

3

Organoid Models

PLATFORM PARTNER: Liverpool School of Tropical Medicine
PLATFORM LEAD: Professor Giancarlo Biagini, Pro Vice-Chancellor for Research & Innovation, LSTM

This highly innovative platform led by the Liverpool School of Tropical Medicine offers industry access to pioneering technologies which support the development of game-changing novel therapeutics. A range of sophisticated technologies including innovative human tissue & microfluidic models, are available to industry to fast-track drug discovery. Any infection can be rapidly screened, and our repository of human tissue models enables more precise assessment of therapeutic impact and efficacy – helping to de-risk development and support innovation. Organ-on-a-Chip (OOC) technology is transforming industry's approach to drug development and precision medicine. In a pioneering development in infection R&D, iiCON provides access to OOC technology that enables companies to bypass in-vivo studies and connect multiple organs, creating holistic models that enable faster, more accurate drug development. This expedites the drug development journey and significantly de-risks late-stage clinical efficacy failures – creating a bridge to Controlled Human Infection Models and/or Phase I and Phase II clinical trials, accelerating product registration and commercialisation and introducing new drugs to market.

4

Advanced AMR Modelling

PLATFORM PARTNER: University of Liverpool
PLATFORM LEADS: Professor William Hope OBE (FRACP, FRCPA, PhD) Dame Sally Davies, Chair of AMR Research, UoL



This platform in molecular pharmacology and pharmacokinetics-pharmacodynamics (PK-PD) led by the University of Liverpool provides new drug development models and approaches to help industry develop new agents to meet the challenge of antimicrobial resistance. It supports the discovery and development of novel therapeutics to tackle the world's most critical, multi-drug-resistant infections.

The multi-drug-resistant pathogens *Pseudomonas aeruginosa* and *Acinetobacter baumannii* are key threats to human health at a global scale. New drugs are urgently required, however robust tools to assess these compounds at the early therapeutic lead stage are poorly developed.

To support industrial innovation, we are extending a suite of model systems that enable new therapeutic solutions for *Pseudomonas aeruginosa* and *Acinetobacter baumannii*. These include new experimental model systems of hospital acquired pneumonia, which continues to be associated with unacceptably high mortality and developing engineered strains that display a variety of resistance mechanisms while remaining highly pathogenic.

5

Human Challenge: Agile End-to-End Clinical Trials

PLATFORM PARTNER: Liverpool School of Tropical Medicine
PLATFORM LEAD: Professor Daniela Ferreira, Professor of Respiratory Infection & Vaccinology at LSTM and the University of Oxford

This platform provides a comprehensive clinical trials package that supports first-in-human testing for a wide range of antimicrobial products and treatments, including hygiene and sanitation products, diagnostics, AI wearables, devices, new therapeutics, and vaccines.

The Human Challenge platform has achieved significant milestones this year, driven by innovative partnerships with academic and industrial collaborators. Led by Professor Daniela Ferreira from the Liverpool Vaccine Group alongside Dr. Ben Morton, the team has advanced key projects such as the TB/BCG Challenge Human Infection Model.

A dedicated and growing team of 23 professionals, including Dr. Andrea Collins and Dr. Shaun Pennington comprises clinical fellows, research nurses, lab technicians, project, trial* and programme managers. They lead clinical trials from the Accelerator Research Clinic (ARC), a state-of-the-art facility with 18 beds and adjacent laboratories. This setup ensures high clinical and research standards, enabling rapid sample processing through the collaboration of an experienced team. Together, they drive initiatives central to iiCON's mission of rapidly and safely delivering new drugs, diagnostics, and vaccines to reduce the global burden of infectious diseases.

A key development in 2024 is the enhancement of the Human Challenge Facility (HCF) at the Liverpool School of Tropical Medicine (LSTM), which is set to revolutionize clinical trials in the Northwest. The HCF is preparing for its first inpatient study, the CEPI MUSICC consortium's SARS-CoV-19 project. This expansion will significantly bolster iiCON's research capabilities, accelerating the development of new products and vaccines, aligning with its goal of improving and saving lives worldwide. Positioned at the forefront of Human Challenge research and global health innovation, iiCON continues to deliver tangible public health benefits in the fight against infectious diseases.

6

Diagnostics

PLATFORM PARTNER: Liverpool School of Tropical Medicine and University of Liverpool

PLATFORM LEADS:

- Dr Ana Isabel Cubas Atienzar, Lecturer of Diagnostic of Infectious Disease at LSTM
- Professor Andy Shaw, Head of the Built Environment and Sustainable Technology Research Institute (BEST) at Liverpool John Moores University
- Professor Rasmita Raval is a Professor in Chemistry and Director of the Surface Science Research Centre at UOL. She is also the Director of 'The Open Innovation Hub for Antimicrobial Surfaces' and a co-founder and director of the UK 'National Biofilms Innovation Centre'

This platform combines the expertise of three regional centres of excellence. It provides industry access to LSTM's broad-based global expertise in diagnostics, break-through sensor technologies developed by Liverpool John Moores University's BEST Research Institute, alongside world-leading surface analysis capability through the University of Liverpool's Surface Science Research Centre.

Sensor technology with advanced AI analysis is being used to help develop point of use non-invasive diagnostics. These range from the measurement of parasites in peripheral blood to quantification of insecticide concentrations on a range of surfaces. The technology is designed to support the real-world development and evaluation of impactful non-invasive diagnostics to quality assure and monitor infectious disease prevention and treatment in order to better protect communities.

Our programme also helps to develop, evaluate and validate a full range of diagnostic technologies including from lab-based assays such as qPCR, ELISA and culture to field deployable diagnostics including rapid diagnostic tests (RDTs) and portable platforms. Our team offers industry access to world-leading expertise and facilities that support every stage of the product journey, from early-stage concept, through evaluation and regulatory approval, to adoption through our Foundation for Innovative New Diagnostics (FIND) and WHO accredited facility. We work with industry to assess diagnostic accuracy including analytical using FDA approved panel of pathogens to clinical accuracy in real-world settings, providing valuable insights to accelerate market access and produce optimal diagnostic deployment. Industry partners benefit from a broad diagnostic expertise and focus across a range of platforms including lateral-flow, antibody, antigen, molecular testing and pathogens.

World-leading surface design and analysis, through the University of Liverpool's Surface Science Research Centre, is enabling anti-infective and vector control surfaces to be evaluated, optimised and upscaled via knowledge-based engineering. This Interdisciplinary Research Centre features sophisticated surface sensitive spectroscopic and imaging techniques. These allow surfaces to be mapped at the nanoscale level and enables the interaction between technology and biological systems to be studied with precision. Our expertise is available to support industry in leveraging this technology to bring forward innovation in the anti-infective surfaces space.

7

Randomised Control Trials

PLATFORM PARTNER: Liverpool School of Tropical Medicine

PLATFORM LEAD: Dr Dave Weetman, Reader, LSTM

Led by the Liverpool School of Tropical Medicine and partners in Democratic Republic of Congo and Uganda, this platform provides robust data to inform global health policy and support and enable market access, helping to protect communities from malaria. This work is already helping to protect communities and save lives by advancing innovative interventions.

In many low and middle income country settings, vector control products often need to be on a WHO recommended list before donors will make large scale purchases. This requires at least two epidemiological impact randomised control trials, which are inevitably time-consuming and usually limited in geographical scale. Pathways to implement trials in a more streamlined manner, which can improve the evidence base for newer products, could greatly assist the decision making process for policy makers and procurers in order to expedite product roll out.



8

Mapping and Modelling

PLATFORM PARTNER: Liverpool School of Tropical Medicine

PLATFORM LEADS:

- Professor Nicholas Feasey, Infectious Diseases physician and Professor of Clinical Microbiology at LSTM
- Dr Grant Hughes, Reader and Wolfson Fellow at LSTM

Supporting innovation and product development, this platform provides the expert insight required to optimally position health interventions. Industry partners can leverage the Liverpool School of Tropical Medicine's world-leading expertise in mapping and modelling of the transmission and dissemination of pathogens at a micro and macro level. A major focus has been the creation of a new study to explore reducing the risk to vulnerable patients of drug-resistant bacterial infections in residential care homes and hospital settings. The study seeks to improve the care of some of the most vulnerable people in society through enhanced infection prevention and control, allowing better stewardship of our last line of defence antibiotics, one of our most precious healthcare resources.

9

Nanotherapeutics

PLATFORM PARTNER: University of Liverpool

PLATFORM LEADS: Professor Neill Liptrott, Chair in Pharmacology and Immunocompatibility and Coordinator of The Nanotherapeutics Hub, UoL

Led by The Nanotherapeutics Hub, located at the University of Liverpool, this platform provides industry and academic partners with access to the Hub's expertise and network of UK partner organisations to support the development of innovative new antimicrobials, biotherapeutics and vaccines leveraging nanotechnology.

The benefits and promises of nanotechnology are clear. However, the robust characterisation of their interactions with biological systems is vital to their translation to clinical use. This platform offers the expertise to determine critical quality attributes for nanotherapeutics to assist in the future rational design of advanced materials. This is further strengthened by The Nanotherapeutics Hub's strategic partnership with the National Measurement Laboratory as well as its active involvement and leadership in national and international programmes and infrastructures in complex medicines.

10

LifeArc Antibody Humanisation

PLATFORM PARTNER: LifeArc
PLATFORM LEAD: Dr Preeti Bakrania, Principal Business Development Manager, Therapeutic Platforms, LifeArc

Led by the self-funded medical research charity, LifeArc, this platform has been designed to provide partners and researchers in the field with streamlined access to LifeArc's leading capabilities in humanising antibodies for therapeutic applications and so help solve vital challenges in infectious diseases. Antibody humanisation enables promising antibody candidates from non-human species to be modified so that they are applicable to humans.

This platform makes LifeArc's expertise in the field of antibody humanisation available commercially to any organisations collaborating with iiCON domestically or internationally.

LifeArc's expertise and track record of success in this field has helped transform the way many conditions are treated, with more than 90 antibodies humanised over the past 30 years and it has contributed to five marketed therapeutics. These results have been achieved by working with research teams and organisations to optimise and humanise the antibodies they have developed and move them closer towards patient impact.

LifeArc is embarking on a global health strategy that aims to accelerate the progression of affordable and accessible solutions that will help further the understanding, diagnosis and treatment of infectious diseases, reducing their prevalence, emergence and impact on lives around the world.

The partnership with LifeArc underlines a core aspect of iiCON's mission, which is to connect the dots across the health & life sciences sector to ensure that the best ideas and the newest technologies get the support they need to achieve significant, real-world results.

11

Long-Acting Therapeutics

PLATFORM PARTNER: University of Liverpool
PLATFORM LEADS: Professor Steve Rannard, and Professor Andrew Owen, Co-Directors of The Centre of Excellence in Long-acting Therapeutics (CELT) at UoL

Led by the University of Liverpool, this platform provides access to the expertise within The Centre of Excellence in Long-acting Therapeutics (CELT) - a cross faculty research initiative combining world-leading expertise in pharmacology and materials chemistry. CELT works with international partners to disseminate research findings in long-acting medicine and change the global landscape of drug administration.

How will CELT drive innovation?

Long-acting therapeutics can have a huge impact for treatment and prevention of chronic diseases but also other applications for acute diseases where multiple pharmaceutical doses are required for successful therapy.

CELT intends to implement impactful solutions to the critical challenges that affect those suffering from these diseases and work with partners to better understand how these technologies can be of most benefit.

CELT aims to provide a better understanding of a range of technologies, to develop new interventions and harmonise strategies to accelerate long-acting therapeutic development and implementation. CELT collaborates globally with industrial, academic and charitable partners as well as patients and doctors, and is keen to establish new links to programmes that aim to deliver clear patient benefits.

This platform within iiCON enables companies of all sizes access to CELT's expertise in long-acting therapeutics supporting impactful collaborations to enhance product and therapeutic efficacy and drive innovation.



“

LONG-ACTING THERAPEUTICS CAN HAVE A HUGE IMPACT FOR TREATMENT AND PREVENTION OF CHRONIC DISEASES BUT ALSO OTHER APPLICATIONS FOR ACUTE DISEASES WHERE MULTIPLE PHARMACEUTICAL DOSES ARE REQUIRED FOR SUCCESSFUL THERAPY.

Platform Leads

iICON'S PLATFORMS ARE HEADED UP BY LEADING GLOBAL EXPERTS IN INFECTIOUS AND TROPICAL DISEASE RESEARCH, THIS WORLD-LEADING EXPERTISE ENABLES OUTSTANDING TRANSLATIONAL RESEARCH. THIS UNIQUE BLEND OF EXPERTISE ACROSS A NUMBER OF THERAPEUTIC AREAS, COUPLED WITH BEST-IN-CLASS R&D FACILITIES, CREATES A REMARKABLE PROPOSITION DESIGNED TO ACCELERATE INDUSTRY INNOVATION AND ENABLE THE DISCOVERY, DEVELOPMENT, AND SUCCESSFUL DEPLOYMENT OF HIGHLY INNOVATIVE THERAPIES, VACCINES, PRODUCTS, AND DIAGNOSTICS TO COMBAT THE GLOBAL THREAT POSED BY INFECTIOUS DISEASES, RESISTANT BACTERIA, AND THE PANDEMICS OF THE FUTURE.

Platform 1 Lead



Dr Adam Roberts, Reader and AMR Lead, LSTM.

Adam has been investigating the fundamental mechanisms of transferable AMR for more than 20 years and, since arriving at LSTM in 2017, has focussed on translational aspects of AMR and early-stage drug discovery and development.

His current research activities include investigations into the many drivers of resistance in a One Health context, the molecular genetics of resistance mechanisms and mobile genetic elements and how they contribute to the dissemination of AMR and the use of evolutionary biology to inform antibiotic treatment regimens and drug design. His team also carries out discovery projects, investigating novel antimicrobial natural products, target-site identification, mechanism of action, and determining the resistance development potential of novel molecules within LSTM's drug development pipeline.

Adam's research activities have led to more than 100 peer reviewed publications and reviews on AMR and his group is currently funded by the Medical Research Council, the National Institute for Health Research, UK Research and Innovation's Strength in Places Fund, and the European Regional Development Fund plus various charities including the Wellcome Trust and the Medical Research Foundation. He runs The Transposon Registry and the award-winning citizen-science, drug-discovery project Swab and Send, is the Network coordinator of the JPIAMR Network of European and African Researchers on AMR (NEAR-AMR) and is a policy advisor (Drug Resistance) to the Royal Society of Tropical Medicine and Hygiene.

Platform 2 Lead



Dr Derek Lindsay, Chief Operating Officer, Infex Therapeutics

Dr Lindsay was a co-founder of Redx Pharma and its Chief Operating Officer from 2012-17. His

former roles include being a Director of Innovation of pharmaceutical industry consortium Britest Ltd from 2006 to 2012, and R&D Director of Avecia Pharmaceutical Products in a management career of more than 30 years. Derek has worked in R&D, Process Development and Hazards at Avecia and its predecessor businesses, Zeneca and ICI, which he joined in 1988, after initially working in R&D at BP from 1985.

Platform 3 Lead



Professor Giancarlo Biagini, Pro Vice-Chancellor for Research & Innovation, LSTM

Professor Biagini's career has focused on the biochemistry, pharmacology and therapeutics of human pathogens most notably *Plasmodium falciparum* and *Mycobacterium tuberculosis*. Basic biochemical research includes the characterisation of bioenergetic components in the respiratory chain and of key substrate and drug transporters. This fundamental work has contributed to our understanding of mechanisms of drug action, major resistance mechanisms in malaria and validation of novel targets for chemotherapy in both malaria and TB. He has over 20 years' experience in molecular pharmacology and drug discovery/development from the development of HTS campaigns to candidate declaration working with Industry and with product development partnerships (PDPs).

More recently, he has been involved in the development of new image-based pharmacodynamic platforms to identify and accelerate antimalarial and antitubercular pre-clinical drug candidates, as well as clinical pharmacology projects towards understanding PK-PD determinants of poor patient outcomes again for both TB and malaria patients. He is the drug lead within Research Centre for Drugs and Diagnostics (RCDD) at LSTM. He is chair of the LSTM Research Committee, Director of the MRC Doctoral Training Partnership in Translational and Quantitative Skills in Global Health and co-lead of LSTM's MRC Skills Development Fellowship programme.

Platform 4 Lead



Professor William Hope OBE (FRACP, FRCPA, PhD) Dame Sally Davies, Chair of AMR Research – Director, Centre of Excellence in Infectious Diseases Research – Co-Lead, NIHR Infectious Diseases National Specialty Group University of Liverpool

Professor Hope qualified in Medicine in 1991, before undertaking specialist training in infectious diseases and clinical microbiology. He completed his PhD in antimicrobial pharmacology in 2006, while undertaking fellowships at the University of Manchester, UK, and the National Institutes of Health, Bethesda, USA. He was an NIHR Clinician Scientist and this award focussed on individualised antimicrobial therapy.

Professor Hope leads the Centre of Excellence in Infectious Diseases Research (CEIDR) which focuses on infection therapeutics. Areas of special interest and research are antimicrobial pharmacokinetics and pharmacodynamics, antimicrobial drug development and individualisation of antimicrobial therapy.

He is a Fellow of the American Academy of Microbiology and European Society of Clinical Microbiology and Infectious Diseases as well as NIHR National Specialty Co-Lead for Infectious Diseases. Professor Hope is a Fellow of the Royal Australasian College of Physicians and a Fellow of the Royal College of Pathologists of Australasia.

Platform 5 Lead



Professor Daniela Ferreira, Professor of Respiratory Infection and Vaccinology at LSTM and the University of Oxford

Daniela is a global leader in respiratory mucosal immunity and Controlled Human Infection Models (CHIM) with experience in bacterial challenge, co-infection studies, vaccine testing and immune responses. She leads a large programme of work on Experimental Human Pneumococcal Challenge and mucosal immunity with collaborators from over 50 laboratories worldwide including South America and Africa and over £20M from various funders including MRC, UKRI, NIHR and top global industry partners.

She is the Head of the Liverpool Vaccine Team based at the Liverpool School of Tropical Medicine. To date her Liverpool-based team has safely challenged over 1800 participants with live bacteria in over 20 clinical studies in their bespoke Accelerator Research Clinic. Daniela has played a substantial role in the UK Covid-19 pandemic response including the leadership of the Liverpool's STOP COVID response and the NIHR NWC Vaccine Alliance Liverpool. Her Liverpool-based team was a trial site for several covid vaccine studies including the Phase II/III of the Oxford/AZ vaccine.

Daniela is on the management board of the HIC-VAC consortium SHE obtained a PhD in Immunology in 2009 from the University of Sao Paulo (São Paulo, Brazil). During her PhD Daniela was awarded the prestigious Robert

Austrian Research Award in Pneumococcal Vaccinology to develop novel nasal vaccines (2006). Daniela joined the Liverpool School of Tropical Medicine in 2009 as a postdoctoral scientist and was promoted to Professor and Head of the Department of Clinical Sciences in 2018. She joined the University of Oxford in June 2022.

Platform 6 Leads



Dr Ana Isabel Cubas Atienzar, Lecturer of Diagnostic of Infectious Disease at the Liverpool School of Tropical Medicine

Ana joined LSTM in 2019, she leads a team which focuses on the development and evaluation of novel diagnostics for emerging viral infections and outbreak prone infectious diseases such as COVID-19, Mpox, Crimean Congo Haemorrhagic Fever (CCHF) and Rift Valley Fever (RVF). Ana played a substantial role in the UK COVID-19 pandemic response including the leadership of the FIND-WHO diagnostic evaluations where her team recruited over 2000 participants in diagnostic trials. She is currently involved in the evaluation of Mpox diagnostics under the FIND-WHO pandemic threats umbrella, the evaluation of novel diagnostics for TB and in the development of point-of-care tests for CCHF and RVF following successful funds from MRC and LifeArc.

She is one of the Diagnostics leads within the Research Centre for Drugs and Diagnostics (RCDD) at LSTM and sits on the Scientific Advisory Group of the Liverpool Pandemic Institute.



Professor Rasmita Raval, Professor in Chemistry and Director of the Surface Science Research Centre at the University of Liverpool

Rasmita is also the Director of 'The Open Innovation Hub for Antimicrobial Surfaces' and is one of the four co-directors of the UK 'National Biofilms Innovation Centre'. Her interdisciplinary research spans knowledge-based design of functional surfaces, molecular nanoscience and bio-interfaces. Her research group combines protocols for targeted assembly of functional nano-architectures and concurrent development and utilisation of powerful scientific techniques to probe the behaviour and performance of these systems at the atomic, molecular and cellular level.

This experimental effort is combined with theoretical modelling to yield insights into molecular and biological responses and behaviour at interfaces. She also leads a dedicated innovation team to translate frontier research into technology platforms, with a specific focus on antimicrobial and anti-infective surfaces and materials. Accelerated translation is driven within an active and connected collaboration ecosystem involving multinational companies and SMEs across multiple sectors, healthcare stakeholders and regional, national and international agencies.



Professor Andy Shaw, Head of the Built Environment and Sustainable Technology Research Institute (BEST) in the Faculty of Engineering and Technology at Liverpool John Moores University

Andy also leads the RF and Microwave (RFM) research theme within the institute. He became a Reader in Environmental and Sustainable technology in 2010 within the BEST research institute and director of the BEST research institute in 2015 and attained his Professorship in Microwave technology in 2016. He has over 20 years of expertise in developing industrial applications, such as material cutting, vitrification, exhaust gas conditioning for vehicles, pyrolysis, torrefaction and gasification, microwave chemistry and microwave biodiesel production. Along with the design and development of numerous NDT sensor technologies for the process engineering, healthcare and manufacturing sectors. He is also a director of the CO Research Trust which is a charity that funds carbon monoxide research.

Platform 7 Lead



Dr Dave Weetman, Reader, LSTM

Dr Weetman graduated in Zoology (BSc) from the University of Newcastle-upon-Tyne and in Ecology (MSc) from The University of Wales, Bangor. His PhD at The University of Liverpool was followed by postdoctoral positions in the Molecular Ecology and Fisheries Genetics Group at the University of Hull. He joined LSTM in 2006 working as a senior PDRA on IVCC and then NIAID-funded projects on the genetic basis of insecticide resistance in the primary malaria mosquito *Anopheles gambiae*. He was appointed as Reader in 2020.

His research aims primarily to investigate the genes and mutations responsible for insecticide resistance in mosquitoes and phlebotomine sandflies and how these spread among populations. A goal of this work is to identify and apply DNA markers for molecular surveillance of insecticide resistance in control programmes. A second area of research is in questions related to the causes and consequences of vector speciation and population subdivision and how these regulate transfer of adaptive traits of medical importance. He is also broadly interested in the application of molecular techniques to applied ecological questions in vector biology. He coordinates the Vector Research Support group (VRS), which provides molecular and biochemical collaboration, training and services to students, visiting scientists and for control trials.

Platform 8 Leads



Professor Nicholas Feasey is an Infectious Diseases physician and Professor of Clinical Microbiology at LSTM

Professor Feasey's research is focused on the surveillance and management of antimicrobial resistant bacterial infection, and taking a one health approach to exploring the transmission of enteric pathogens

associated with invasive disease. His research group uses bacterial genomics, spatial statistics and transmission modelling in collaboration with the Wellcome Sanger Institute and CHICAS at the University of Lancaster.



Dr Grant Hughes, Reader and Wolfson Fellow at LSTM

Dr Hughes' PhD research at The University of Queensland focused on developing a symbiotic control strategy of an agricultural disease caused by a viral pathogen transmitted by Planthoppers. To further his expertise in the vector biology and symbiosis fields he undertook a Postdoctoral fellowship at Johns Hopkins School of Public Health, and then a Research Associate position at Penn State University where he examined the interactions between *Wolbachia*, a common bacterial endosymbiont of insects, other microbiota, and *Plasmodium* parasites in *Anopheles* mosquitoes. In 2015, he joined the Department of Pathology at the University of Texas Medical Branch as an Assistant Professor and focused on examining interactions between the microbiome and arboviruses in *Aedes* mosquitoes. Professor Hughes joined the Departments of Vector Biology and Tropical Disease Biology at LSTM in 2018 where his group works on arboviruses and microbes of mosquitoes.

Platform 9 Lead



Professor Neill Liptrott, Chair of Pharmacology and Immunocompatibility and Coordinator of The Nanotherapeutics Hub at the University of Liverpool

Neill has a background in pharmacology, immunology, immunopharmacology and molecular cell biology. His research is aimed at investigating the biological interactions of conventional and nanotechnology-enabled medicines and therapeutics, as well as other novel therapeutic strategies such as cellular therapies. His team is also investigating impacts on cellular health and metabolism that may underpin these interactions and building structure-activity relationships between nanomaterial characteristics and their impact on biological systems using established and novel techniques. Neill leads several advanced therapeutics/materials immunocompatibility research programmes locally, nationally, and internationally.

Platform 10 Lead



Dr Preeti Bakrania, Principal Business Development Manager, Therapeutic Platforms, LifeArc

Preeti Bakrania leads the Business Development and Partnerships activities for the Therapeutic Platforms at LifeArc including the commercialisation of monoclonal antibody discovery and humisation platforms. She obtained her PhD in Biochemistry at the National Institute for Medical Research and has more than 20 years research experience working in a number of disease areas including neuroscience, oncology and ophthalmology

with postdoctoral roles held within UCL, University of Cambridge and University of Oxford. She joined LifeArc 16 years ago working on both small molecule and biologics drug discovery programs. Preeti is an experienced project and portfolio manager where she managed LifeArc's world-leading antibody humanisation portfolio, which has resulted in the development of five commercialised drugs, including Keytruda® and Leqembi® and also led LifeArc's portfolio to generate fully human antibodies using our in licensed transgenic mouse platform against a number of target classes across a wide range of disease areas for pre-clinical development. More recently, in her role as a Scientific Director leading the Biologics Discovery and Development team in LifeArc's Therapeutic Translation Platform group she oversaw a team of 28 scientists based at sites in Stevenage and the Francis Crick Institute who are dedicated to the successful delivery of high-quality biological therapeutics to support LifeArc's portfolio.

Preeti is a passionate scientist that thrives on the successful delivery of drug discovery programs to the clinic for the benefit of patient healthcare and has a track record of success with a number of publication, named inventor on four patents and has been a Board Observer for DJS antibodies which was recently acquired by Abbvie.

Platform 11 Leads



Professor Steve Rannard, Co-director of the Centre of Excellence for Long-acting Therapeutics (CELT)

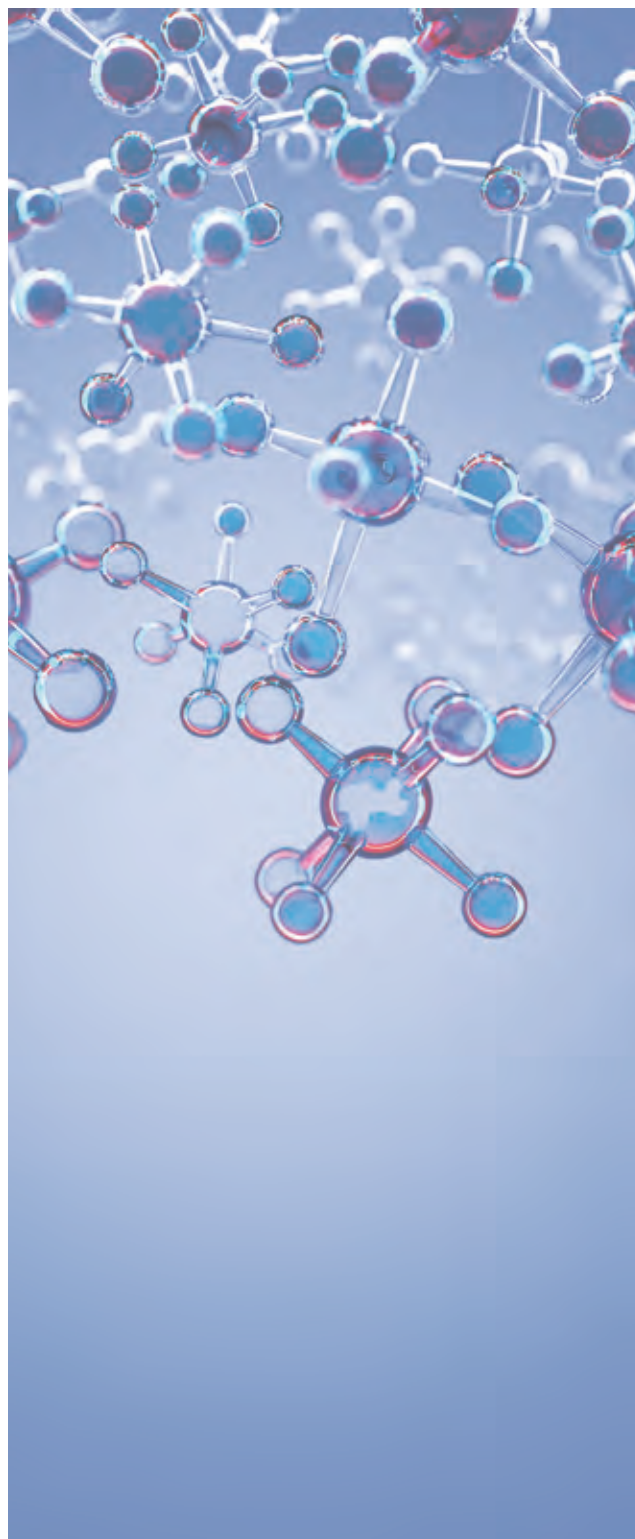
Steve is a professor of chemistry at the University of Liverpool. He is a co-director of the Centre of Excellence for Longacting Therapeutics (CELT), the academic lead for Nanomedicine within the Materials Innovation Factory and Director of the Radiomaterials Laboratory within the Department of Chemistry. His therapeutic research primarily focuses on advanced materials science onto unmet medical/clinical needs to target new patient benefits using scalable polymer syntheses, nanoparticle synthesis, solid drug nanoparticle formulation and nanoemulsion platforms. Steve spent 16 years in industry (Cookson, Courtaulds, Unilever) and has co-founded four start-up companies (IOTA Nanosolutions Ltd, Hydra Polymers Ltd, Tandem Nano Ltd, and Polymer Mimetics Ltd). Steve was the first recipient of the RSC/Macro Group UK Young Researcher of the Year medal, sequential RSC Industrial Lectureships at Strathclyde and Sussex, a visiting lectureship at Sussex, visiting Professorship at UOL, and a Royal Society Industry Fellowship.



Professor Andrew Owen, Co-director of the Centre of Excellence for Long-acting Therapeutics (CELT)

Andrew is a co-director of the Centre of Excellence in Long-acting Therapeutics (CELT) at the University of Liverpool. He is principal investigator for LONGEVITY, an international project funded by Unitaid that aims to translate long-acting medicines for malaria, tuberculosis, and Hepatitis C Virus. Andrew also leads a

modelling and simulation core and sits on the executive group for the NIH-funded Long-acting/Extended-release Antiretroviral resource Programme (LEAP). He is a Director and Chief Scientific Officer for Tandem Nano Ltd. and co-inventor of patents relating to drug delivery. Since March 2020, he has been intensively engaged in evaluation of SARS-CoV-2 antiviral candidates.



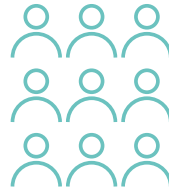
Impact: Driving Forward Life-saving Innovation

iICON IS DRIVING INNOVATION – SUPPORTING DISCOVERY AND COMMERCIAL DEVELOPMENT AT ALL STAGES OF THE INNOVATION JOURNEY AND PIVOTING PLATFORMS TO RESPOND TO PUBLIC HEALTH NEEDS NATIONALLY AND GLOBALLY.



596 SMEs

working with iICON to drive the discovery and development of new products and treatments



**293
ENGAGEMENT
ACTIVITIES**

**36 NEW
PRODUCTS**

have come through the iICON programme to reach patients and consumers



180 CONTRACTS

with commercial or industrial partners have been signed



OVER £858M

spent on Infection R&D activity within the North West alone since launching

Impact: Case Studies

EACH iiCON PLATFORM IS DRIVING FORWARD LIFE-CHANGING INNOVATIONS AND SUPPORTING THE DEVELOPMENT OF LIFE-SAVING PRODUCTS AND THERAPEUTICS. BRINGING TOGETHER INDUSTRY AND CUTTING-EDGE RESEARCH TO SUPPORT CO-INNOVATION AT EVERY STAGE OF THE INNOVATION JOURNEY, OUR PROGRAMME SUPPORTS DYNAMIC TRANSLATIONAL RESEARCH. HERE WE EXPLORE IMPACT CASE STUDIES FROM A SELECTION OF OUR PLATFORMS.



PLATFORM LEAD

Professor Giancarlo Biagini
Pro Vice-Chancellor for Research & Innovation, LSTM

PLATFORM THREE IMPACT STUDY 1

Revolutionising Organoid Research with High-Containment Robotics and Cutting-Edge Automated Labs

Human organoid research is revolutionising infection R&D, providing groundbreaking methods to combat some of the world’s most formidable and deadly infections. At the forefront of this revolution, iiCON and consortium lead, the Liverpool School of Tropical Medicine (LSTM), are creating a state-of-the-art containment level 3 organoid facility. Led by Professor Janet Hemingway, a multidisciplinary team of biologists, chemists, and engineers is propelling this ambitious project forward to enhance organoid platform capabilities.

Supported by £10 million in Innovation Zone funding and additional grants from the Wolfson Foundation and RED/UKRI, this cutting-edge facility will be equipped with advanced automation and AI tools. These technologies will empower researchers and commercial partners to efficiently generate organoids and safely study their interactions with pathogens and new drug actives, accelerating the development of innovative treatments.

This groundbreaking facility will significantly bolster iiCON’s ability to commercialise its pioneering organoid R&D platform. By fostering industry innovation, streamlining research processes, and expanding collaborative efforts, this advanced laboratory will accelerate the creation of new treatments and products. It will make this highly specialised resource accessible to a broader range of companies, both nationally and internationally, ushering in a new era of medical advancements.



**PLATFORM LEADS**

Dr Ana Isabel Cubas Atienzar
Lecturer of Diagnostic of Infectious Disease at the Liverpool School of Tropical Medicine

Professor Rasmitha Raval
Professor in Chemistry and Director of the Surface Science Research Centre at the University of Liverpool

Professor Andy Shaw
Head of the Built Environment and Sustainable Technology Research Institute (BEST) in the Faculty of Engineering and Technology at Liverpool John Moores University

PLATFORM SIX IMPACT STUDY 1**Using microwave sensor products to help eliminate neglected tropical diseases (NTDs)**

iiCON has developed an international and multi-partner portfolio of microwave sensor products to help eliminate various NTDs. The technology offers low-cost handheld solutions for non-invasive measurements, and the implementation of artificial intelligence provides an instant assessment of the measured substrate. Currently, this technology is used to improve the quality of insecticide indoor residual spraying (IRS) activities in Southeast Asia. The device can monitor the concentration of alpha-cypermethrin on any wall surface and is validated for use in India and Nepal. The success of this technology has led to further research and expansion to enable monitoring of multiple classes of insecticides currently used in Africa. Additional field data collection was undertaken in Tanzania and Ghana for Actellic, Sylando, and Vectron insecticides. The collected data is used to develop new prediction models for quality assurance of selected insecticides on sprayed surfaces.

The sensors' capability to monitor surfaces has led to further assessment of the concentration of Etofenprox and Permethrin insecticides on military uniforms (funded by the Deployed War Fighter Program) to ensure they remain effective after multiple wash cycles. The aim is to use a microwave sensor system to monitor and increase the quality assurance of these insecticide-treated uniforms, specifically focusing on the longevity of the insecticide efficacy in tropical environments. The flexibility offered by the microwave sensor enabled the development of a transdermal MW sensor for lymphatic filariasis detection (funded by the Bill & Melinda Gates Foundation).

A second iteration of machine learning enabled design has resulted in a hardware preliminary prototype with a linked Bluetooth transmitter for cable-free wearability and remote data acquisition. The initial prototype design has been piloted in India in partnership with AIIMS Patna, where prototype units were tested with 96 participants in the local community setting.

PLATFORM SIX IMPACT STUDY 2**Rapid response to current outbreak and pandemics**

The COVID-19 pandemic brought to light the difficulties in meeting the increased demand of decentralised diagnostics for viruses prone to outbreaks. The FIND programme led by Dr Ana Isabel Cubas Atienzar which is being supported through iiCON's Diagnostics platform, aims to ensure the availability of accurate and easily deployable rapid diagnostics for future pandemic and outbreak preparedness.

Recent research of this platform on Mpox diagnostics following the 2022 outbreak has provided important insights on what currently commercially available diagnostics technologies fulfil the performance requirements recommended by the World Health Organisation (WHO) and which failed performance and should not be used for diagnostics of this highly infectious virus. Findings of this research highlighted high clinical diagnostic accuracy when using upper-respiratory swabs as an alternative sample type to skin lesions for PCR testing in early stage of the disease. These findings are very promising, as the use of upper-respiratory swabs for early detection of mpox disease provide a reliable diagnostic strategy for mpox patients that do not show skin lesions and are in the prodromal phase of the disease. The other finding was the urgent need for rapid diagnostic tests (RDTs) for Mpox due to the lack of diagnosis accuracy of all the brands evaluated in this research.

WHO declared on the 14th August 2024 a public health emergency of international concern given the significant increase in Mpox cases which has the potential to spread beyond Africa. iiCON's Diagnostic platform and FIND are continuing working together to further improve diagnostics for Mpox.

**PLATFORM LEAD****Dr Tim Ellis**Funding Lead, Global Health,
LifeArc**PLATFORM TEN IMPACT STUDY****LifeArc fund to accelerate the development of therapies and diagnostics for infectious diseases impacting low- and middle-income countries**

As part of the LifeArc partnership with LSTM and the LSTM led iiCON Consortium, £2.7M was made available to help develop technologies that have the potential to impact the lives of people in low- and middle-income countries (LMICs) who are impacted by infectious diseases. These include neglected tropical diseases and viral threats, such as Dengue and other flaviviruses.

The *Translational Development Fund* offered grant funding to investigators at LSTM and iiCON's partner organisations to develop therapies and diagnostic tests for infectious diseases principally impacting LMICs.

Awards supported early-stage, translational research projects and enabled LSTM and iiCON investigators to work in collaboration with researchers based at institutions in sub-Saharan Africa.

- Communicable diseases cause over eight million deaths each year and significantly impact the lives of many more.
- There is a disproportionate impact on people in LMICs, with the burden being almost twenty times higher compared to high income countries.
- The impact of infectious diseases is projected to escalate due to factors such as climate change, migration and intensive farming.

In April 2024, LifeArc awarded 3 grants (subject to contracting) to support the development of the following technologies:

- **Repurposing a registered antibiotic for the treatment of onchocerciasis** – project led by Professor Joseph Turner, Liverpool School of Tropical Medicine, UK
- **Development of a diagnostic test for viral haemorrhagic fevers** – project led by Dr Ana Isabel Cubas Atienzar, Liverpool School of Tropical Medicine, UK
- **A dried spot collection kit for the transportation of patient samples and the diagnosis of central nervous system infections** – project led by Dr Brenda Kwambana-Adams, Malawi-Liverpool Wellcome Programme, Malawi



PLATFORM LEAD

Professor Giancarlo Biagini
*Pro Vice-Chancellor for Research
 & Innovation, LSTM*

PLATFORM THREE IMPACT STUDY 2

Developing new organoid models

The global rise of antimicrobial resistance (AMR) in *Neisseria gonorrhoea* is a growing concern, as it severely limits treatment options for gonorrhoea infections. Current drug discovery efforts are hampered by the lack of models that effectively demonstrate a drug's efficacy within human cells. This limitation poses a major obstacle in progressing new drug therapies through approval pipelines. Both healthcare providers and pharmaceutical developers are urgently in need of a solution that allows accurate testing of drug candidates against *N. gonorrhoea* within an intracellular environment.

In collaboration with Evotec, LSTM, through the iCON consortium, is spearheading the development of a novel organoid model designed to overcome this challenge. The team is engineering conditions that enable the intracellular growth of *N. gonorrhoea*, moving from a single-cell platform to a more sophisticated organoid system. By integrating advanced imaging technologies, we will visualise bacterial behaviour within human cells, enabling unprecedented insights into how these organisms interact with potential drug compounds. In addition to well-characterised reference strains, newly identified clinical strains will also be introduced into the testing system, further enhancing the relevance of this model for drug discovery.

Funding has recently been secured to automate the generation, infection, sampling and analysis of organoids. This will remove the bottleneck which currently exists in the application of organoid technology for use in assessing the efficacy of small molecules and biologics targeting a range of bacterial and viral pathogens. Ultimately, through use of close loop AI-based analysis and infection, will accelerate delivery of novel therapeutics to the clinic.

This project will streamline the process of discovering new treatments for *N. gonorrhoea* by creating more relevant and precise test systems. The automated generation, infection, and sampling of organoids will accelerate the pace of research, significantly reducing bottlenecks in current drug evaluation processes. The model will be adaptable to assess not only drug efficacy but also immune therapies, potentially opening the door for broader applications across a range of infectious diseases.

The development of this organoid model will mark a significant breakthrough in the field of infectious disease research. It will provide an innovative platform that allows pharmaceutical companies and research institutions to better evaluate the efficacy of new drugs. The aim is to automate key processes to ensure that organoid-based systems become a reliable and efficient tool, addressing not only gonorrhoea but also other intracellular pathogens.



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THE AIM IS TO AUTOMATE KEY PROCESSES TO ENSURE THAT ORGANOID-BASED SYSTEMS BECOME A RELIABLE AND EFFICIENT TOOL, ADDRESSING NOT ONLY GONORRHOEA BUT ALSO OTHER INTRACELLULAR PATHOGENS.

SME Impact Studies



SME IMPACT CASE STUDY 1:

Oxford SimCell Limited

Oxford SimCell is one of the accelerator companies that iiCON has continued to work with. They have secured a Biomedical Catalyst (BMC) award, with the Liverpool School of Tropical Medicine (LSTM) being collaborators.

Oxford SimCell is a spin-out from the University of Oxford that is developing vaccines using a novel technology approach. The BMC project is utilising peripheral blood mononuclear cell models developed by LSTM to evaluate the immunogenicity of the SimCell vaccine candidate.

This will provide an evaluation of the in vitro effectiveness of a new formulation of the SimCell vaccine, which has a longer shelf life and can be stored at room temperature.

This work is paving the way for the development of a vaccine suitable for global use, which is effective against *Pseudomonas aeruginosa* – a World Health Organisation (WHO) priority 1 pathogen that is responsible for over 500,000 deaths per year globally, of which over 300,000 are associated with antimicrobial resistance.



OUR COLLABORATION WITH LSTM, SUPPORTED BY THE BIOMEDICAL CATALYST AWARD, IS A TESTAMENT TO THE STRENGTH OF OUR PARTNERSHIPS. WE ALSO VALUE THE CONTINUED SUPPORT FROM iiCON, WHOSE ROLE IN FACILITATING THIS PROJECT HAS BEEN CRUCIAL. TOGETHER, WE ARE ADVANCING OUR SIMCELL VACCINE TECHNOLOGY TO ADDRESS THE URGENT NEED FOR EFFECTIVE SOLUTIONS AGAINST MULTI-DRUG RESISTANT PSEUDOMONAS AERUGINOSA. THIS PROJECT EXEMPLIFIES HOW INNOVATIVE PARTNERSHIPS CAN DRIVE SIGNIFICANT PROGRESS IN GLOBAL HEALTH, ESPECIALLY IN REGIONS WHERE SUCH ADVANCEMENTS ARE MOST NEEDED.

Chia-Chen (Jane) Hsu,
COO of Oxford SimCell Limited

IMPACT CASE STUDY 2:

Microbials Accelerator Program

Overview

The Microbials Accelerator, launched by LYVA Labs and BioNow with partners including iiCON, University of Liverpool, Centre for Process Innovation (CPI), and Health Innovation Northwest Coast, aimed to support SMEs developing microbiome, biofilm, and phage technologies. The program offered ten companies critical business support, clinical advice, and guidance on securing Innovate UK Biomedical Catalyst funding.

Objectives

- Equip SMEs with skills and expertise to scale their businesses.
- Assist in applying for up to £100k in Innovate UK Biomedical Catalyst funding.
- Provide a comprehensive support package, including technical and business advice.



EXPLORING NEW TECHNOLOGIES AND CREATIVE COLLABORATIONS THAT WILL DELIVER NEXT-GENERATION TREATMENTS IS AT THE HEART OF iiCON'S MISSION. WE'RE THEREFORE DELIGHTED TO BE COLLABORATING WITH LYVA LABS ON THIS TARGETED SUPPORT PROGRAMME, WHICH WILL GIVE SMES AND THOSE WITH NEW IDEAS ACCESS TO A VARIETY OF REALLY IMPACTFUL BENEFITS, SUCH AS THE ABILITY TO UPSCALE AND OVERCOME PRODUCT DEVELOPMENT OBSTACLES.

Janet Hemingway,
Founding Director, Infection Innovation Consortium (iiCON)



Results

- Funding Success: Nine companies secured £1 million in Innovate UK Biomedical Catalyst funding for R&D and commercialisation.
- Ongoing Projects: Oxford Sim Cells (OSC) received support to develop preclinical vaccine candidates in collaboration with iiCON, using a novel approach with genome-free bacteria.

Impact

The Microbials Accelerator successfully advanced SME capabilities, facilitated significant funding, and fostered valuable partnerships, exemplified by OSC's continued innovation and development.

SME IMPACT CASE STUDY 3:

Virustatic/The Daughters of Mars

Virustatic, an innovator in antimicrobial textile coatings, developed a protein-based coating for facemasks and is expanding into women's health with a coated tampon designed to prevent bacterial vaginosis. To advance their technology and meet regulatory requirements, Virustatic collaborated with iiCON.

Virustatic faced several key challenges:

- **Effectiveness Testing:** Verifying the antimicrobial properties of their facemask.
- **Regulatory Compliance:** Navigating complex regulatory requirements.
- **Funding:** Assisting with grant applications to support research and development.
- **Experimental Design:** Creating experiments to validate product claims.



iiCON provided crucial support in the following areas:

- **Effectiveness Testing:** Collaborated with the Liverpool School of Tropical Medicine (LSTM) to rigorously test the facemask, confirming its antimicrobial efficacy against pathogens.
- **Regulatory Strategy:** Assisted Virustatic in understanding and meeting regulatory standards for product approval, facilitating smoother market entry.
- **Grant Applications:** Helped prepare and submit grant applications, to secure necessary funding for further development.
- **Experimental Design:** Designed experiments to support the tampon's claims of maintaining vaginal health and preventing bacterial vaginosis, providing robust evidence for regulatory approval.



PARTNERING WITH iiCON WAS PIVOTAL FOR US. THEIR EXPERTISE IN TESTING, REGULATORY STRATEGY, AND GRANT APPLICATIONS WAS INSTRUMENTAL IN BRINGING OUR INNOVATIVE ANTIMICROBIAL TECHNOLOGY TO MARKET. THEIR SUPPORT NOT ONLY VALIDATED OUR PRODUCTS BUT ALSO ENABLED US TO SECURE THE NECESSARY FUNDING AND APPROVALS TO ADDRESS CRITICAL HEALTH CHALLENGES EFFECTIVELY.

Lucy Hope,
Director of Virustatic

The collaboration yielded significant results:

- **Validated Technology:** Effective antimicrobial facemask with proven performance.
- **Regulatory Approval:** Successful compliance with regulatory requirements.
- **Funding:** Funding applications submitted for continued innovation.
- **Validated Claims:** Strong evidence supporting the tampon's health benefits.

The partnership between Virustatic/Daughters of Mars and iiCON highlights the impact of strategic support in advancing innovative technologies and addressing critical health issues.



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THE PARTNERSHIP BETWEEN VIRUSTATIC AND iCON HIGHLIGHTS THE IMPACT OF STRATEGIC SUPPORT IN ADVANCING INNOVATIVE TECHNOLOGIES AND ADDRESSING CRITICAL HEALTH ISSUES IN INNOVATE UK BIOMEDICAL CATALYST FUNDING FOR R&D AND COMMERCIALISATION.

Regional Impact

ReCITE: Tackling Avoidable and Unfair Differences in Health through Community-Driven Storytelling



In an initiative led by the Liverpool School of Tropical Medicine (LSTM), the ReCITE project is set to make a significant impact on public health in Merseyside's most deprived communities. With a generous £2.5 million funding from UK Research and Innovation (UKRI) as part of the Arts and Humanities Research Council, Mobilising Community Assets to Tackle Health Inequalities program, ReCITE aims to build trust and enhance uptake of essential health prevention and promotion measures, such as cancer screening, childhood immunisation, and social and mental wellbeing services.

Empowering Communities through Storytelling

ReCITE is more than just a health intervention; it is a vibrant, community-driven project that combines the power of storytelling with local health expertise. By collaborating with individuals who have firsthand experience of health disparities, along with health providers, community champions, and storytellers, ReCITE will create immersive, multimedia stories. These stories are designed to build confidence in preventative public health measures and counteract misinformation.

The project's approach involves linking local communities with creative professionals to develop compelling narratives that resonate with residents. This strategy not only aims to increase awareness and trust but also empowers communities to advocate for their own health needs.

Addressing Local Health Priorities

The ReCITE project is focused on addressing health priorities in Merseyside's most underserved areas. By using local data to identify specific health issues, such as low vaccine uptake, the project will develop targeted solutions that cater to the unique needs of each community. This localised approach ensures that the interventions are relevant and effective.

Building on Previous Success

ReCITE draws on lessons from the global south, following successful community health models for maternal and newborn health and HIV testing in Kenya. This approach has proven effective in identifying and addressing local health challenges, and it promises to bring meaningful improvements to health outcomes in Merseyside.

A Collaborative Effort

The success of ReCITE hinges on the collaboration between a diverse array of partners. ReCITE will host events that bring together health professionals, community members, and arts sector groups. These gatherings will foster collaboration, share insights, and scale up innovative Community Innovation Teams across Merseyside.

In addition to LSTM, the project benefits from the expertise and support of the Infection Innovation Consortium (iiCON), the University of Liverpool, Liverpool John Moores University, Edge Hill University, the University of Bristol, Writing on the Wall, Capacity Development International, and Collective Encounters. This coalition of institutions and organizations brings a wealth of experience and resources to the project, enhancing its potential for success.

Professor Miriam Taegtmeier, the project lead from LSTM, expressed enthusiasm about the initiative:



WE ARE PLEASED TO HAVE THIS OPPORTUNITY TO BRING CREATIVE STORYTELLERS TOGETHER WITH LOCAL COMMUNITIES, HEALTH PROFESSIONALS, AND RESEARCHERS. RECITE PUTS PEOPLE WITH LIVED EXPERIENCE AT THE HEART OF TACKLING HEALTH INEQUITIES, HARNESSING THE POWER OF TELLING STORIES THAT RESONATE WITH PEOPLE TO CATALYSE CHANGE AND ADVOCATE FOR UNDER-SERVED COMMUNITIES.

As ReCITE progresses, it will test and evaluate the effectiveness of this innovative approach, aiming to set a new standard for community-driven health interventions. By integrating creative storytelling with public health efforts, ReCITE promises to make a lasting impact on health equity in Merseyside and beyond.

Case Study: The Health Equity Liverpool Project (HELP)

Background

The Health Equity Liverpool Project (HELP) was established in December 2021, by Liverpool City Council, The Liverpool School of Tropical Medicine, Capacity Development International, and Central Liverpool Primary Care Network (CLPCN). iiCON provided project management and administrative support for this project. HELP's primary aim was to support delivery of local solutions based on local data, to overcome barriers to vaccine uptake and access to key health services in underserved areas.

In its first year, HELP adapted a proven community-health model, used in Kenya to improve uptake on antenatal care, to tackle low COVID-19 vaccination rates among the most deprived populations in CLPCN. The project brought together diverse stakeholders at the community level to collect, review and use data to develop solutions and measure their impact. Multi-professional "Community Innovation Teams" (CITs) covering the geographical range of Central Liverpool PCN received £20,000 in funding alongside coaching and capacity development in research methods; data management and use; quality improvement; behaviour change principles; communication; and programme management. CITs developed initiatives that resulted in 539 individuals from targeted communities being vaccinated (225 white men <50 years old and 314 women of reproductive age). The teams also corrected data issues that affected 261 Chinese and other international students whose overseas vaccinations had not been recognised. Beginning in January 2023, the project expanded to address a broader range of health equity issues across four additional primary care networks:

- Central Liverpool Primary Care Network (CLPCN)
- North Liverpool PCN (NLPCN)
- Anfield and Everton PCN
- Speke, Woolton, Allerton, Gateacre, Garston, and Aigburth PCN (SWAGGA)

Key focus areas included MMR vaccination uptake (CLPCN and NLPCN), breast cancer screening (Anfield and Everton PCN), and cervical cancer screening for refugees, asylum seekers, and women with severe mental illness (SWAGGA).

Project Impact

Using local data, the CITs developed a range of creative health education and communication interventions to reach their target populations. This included videos from trusted messengers used on social media, GP screens and outreach events; use of humour, poetry and sewing workshops, photo exhibitions in community spaces, visually engaging non-NHS branded flyers, easy-read, community friendly material on social media and face-to-face campaigns in the community.

1. The Anfield and Everton team launched the "Be Breast Savvy" Roadshow across North Liverpool's communities, bringing a colourful riot of science, media, and art to alleviate fears, promote the benefits of breast screening and rebook mammograms for women who did not attend (DNA) their last appointment.
2. The South Liverpool team brought cervical screening to refugee and asylum seeker accommodation, delivering smaller personalised community events and enhanced clinics for people with severe mental illness and learning disabilities.
3. The Central & North Liverpool team hosted community engagement and immunisation events, school coffee mornings, and critical thinking workshops to create talking spaces for parents around MMR. They also launched a benevolent rumours campaign (designed in a 'conspiracy theory' style) to counteract the spread of myths and misinformation.

Active community engagement culminated in over 60 community events, 1000's of conversations and 100's of cancer screening re-bookings.

The Anfield and Everton team successfully decreased the number of DNAs for routine breast screening by 16% and 25% in two of their GP practices and by 13.5% across the PCN. The team's innovative roadshow won the Liverpool City Region Culture and Creativity award, 2024 for health and wellbeing.

The South Liverpool teams' personalised approach to cervical screening resulted in a 20% increase in uptake among asylum seekers and refugee women, and a 2.5% increase in uptake across all GP practices for women with severe mental illness and learning disabilities.



In North and Central Liverpool, MMRI uptake remains stubbornly low, and the team continues to engage with parents of unvaccinated children to address their deep-founded fears. They recognise that this will not be a quick fix and are using multiple media and communication channels to change the narrative. Their insight work supported the development of the most recent national child immunisations campaign.

In addition to public health impact, evaluation of the HELP project identified a further 5 types of health system impact:

1. Created new networks, stakeholders, funding and commissioning for health equity
2. Increased capacity of community organisations and people with lived experience to present, advocate for and generate support & funding to act on health equity
3. Started new conversations as changes in language and attitude address misinformation, fear and trust of health services
4. Enhanced teamwork and morale among NHS staff and community stakeholders to address health equity
5. Engaged with decision makers, advocating for policy change reflecting a community-led creative health approach



Conclusion

HELP’s success in using community-driven methods and trusted relationships has made a significant impact on health equity in Liverpool. By incorporating local knowledge and focusing on culturally sensitive approaches, the project has set a strong example for addressing health disparities and improving access to essential services.

Going forward, the HELP community health model will be sustained through additional funding. Liverpool School of Tropical Medicine with other academic, health, community and arts partners has been awarded a 3-year programme (2024-2027) from the Arts and Humanities Research Council to build community storytelling and advocacy into our existing community-led, creative health approach, giving voice and platforms to communities to actively tackle avoidable and unfair differences in health. This approach is being extended beyond Liverpool to the boroughs of Knowsley and Sefton, and will provide additional funding to community organisations and primary care networks interested in adopting this approach.

Efforts to sustain the approach are also taking place at the community level. The Anfield and Everton team have been awarded new funding (April 2024) from Cheshire and Merseyside Cancer Alliance to rollout a more refined Be Breast Savvy Campaign building on the strong community partnerships already developed. To further sustain their work, the primary care network, with their community partner, The Breckfield Centre (BNENC) are in the process of establishing a Charitable Incorporated Organisation to help them bid for new funding. The Central, North and South Liverpool CITs also have funding applications in process to continue and expand their work.



My nan told me about the devastating effect of measles. It made me realise that we are really lucky to have an immunisation program in place.

I am very grateful that I went for that smear, it saved my life.

The benefits of cervical screening are to detect problems early.

This is the message of the campaign. The impact it can have on children's health is significant. Measles is a preventable disease and a preventable death for thousands of children.

Chloe says... Most women will receive a letter telling them that they have found no signs of breast cancer.

Fatin says... MMR immunisation can give you long term immunity against measles.

Helen says I have 3 kids and they are all immunised and I'm glad enough to have 3 grandkids and they are all immunised.

Pranav says... Measles can often cause a weakened immune system. You are more likely to get other infections.

Becki says... We want to combat cervical cancer. The impact it can have on children's health is significant. Measles is a preventable disease and a preventable death for thousands of children.

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HELP'S SUCCESS IN USING COMMUNITY-DRIVEN METHODS AND TRUSTED RELATIONSHIPS HAS MADE A SIGNIFICANT IMPACT ON HEALTH EQUITY IN LIVERPOOL. BY INCORPORATING LOCAL KNOWLEDGE AND FOCUSING ON CULTURALLY SENSITIVE APPROACHES, THE PROJECT HAS SET A STRONG EXAMPLE FOR ADDRESSING HEALTH DISPARITIES AND IMPROVING ACCESS TO ESSENTIAL SERVICES.

iiDiagnostics



iiDIAGNOSTICS, iICON'S FIRST SPINOUT, FACILITATES INDUSTRY ENGAGEMENT AND COMMERCIAL ACCESS TO ADVANCED DIAGNOSTICS, R&D EXPERTISE, AND FACILITIES.



Through iICON's new spinout, businesses can access the Liverpool Insect Testing Establishment (LITE). Originally established by LSTM's Vector Biology Department and now incorporated into iiDiagnostics, LITE is world-renowned for its research on insecticide resistance in disease vectors. LITE tests new insecticides or repellent based products against a wide range of mosquito populations for commercial partners.

Professor Hillary Ranson, Professor of Medical Entomology at LSTM and founder of LITE, is iiDiagnostics Chief Scientific Officer.

"iiDiagnostics supports every stage of the diagnostic development journey from early-stage concept and specification design to prototype development, end-stage evaluation and regulatory approval," said Professor Ranson.



iiDIAGNOSTICS ENABLES INDUSTRY TO DIRECTLY INTERACT WITH ITS GAME CHANGING SCIENTISTS TO SUPPORT THE ASSEMBLING, MARKETING AND DISTRIBUTION OF INNOVATIVE NEW DIAGNOSTICS, VECTOR CONTROL PRODUCTS OR SENSOR TECHNOLOGY.

This dynamic commercial platform supports the discovery and development of innovative, life-saving diagnostics. It supports co-innovation and partnership working, enhancing the delivery of new diagnostic solutions that will ease the global burden of disease.

Previously, iiDiagnostics activities were housed within separate research groups at LSTM. However, this set up lacked the flexibility to fully optimise the skills and unique capabilities of the teams and their facilities.

Now, iiDiagnostics enables industry to directly interact with its game changing scientists to support the assembling, marketing and distribution of innovative new diagnostics, vector control products or sensor technology. The sensor technology is co-developed with Liverpool John Moores University.

iiDiagnostics offers industry access to the UK's only validation site for the Foundation for Innovative Diagnostics (FIND). This encompasses expertise ranging from the development of point-of-care diagnostics such as rapid-diagnostic-tests (RDTs) to simplified molecular diagnostics that can be used at the community level. The team has also worked on a range of targets including emerging infectious diseases, antimicrobial resistance, and neglected tropical diseases.

Professor Janet Hemingway, iiDiagnostics CEO, explains: "With world-leading experts backed by LSTM's FIND and WHO accredited facility, we are the collaborator of choice for industry partners. We are increasingly in demand due to our broad diagnostic focus and skills across a range of platforms including lateral-flow, antibody, antigen, and molecular testing, in addition to access to Biological Safety level 3 laboratories."

Current iiDiagnostics priorities include developing new methods to assess insecticide levels on bed nets. This will help resolve quality control issues encountered when countries or big organisations procure significant quantities of nets.



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iiDIAGNOSTICS SUPPORTS EVERY STAGE OF THE DIAGNOSTIC DEVELOPMENT JOURNEY FROM EARLY-STAGE CONCEPT AND SPECIFICATION DESIGN TO PROTOTYPE DEVELOPMENT, END-STAGE EVALUATION AND REGULATORY APPROVAL

Future Proofing

Investment & Job Creation



368 Contracts signed with iiCON to date



278 Jobs created with 33 safeguarded



180 Contracts with commercial or industrial partners



770 Direct and indirect jobs created to date

Capacity Development – future-proofing the Infection R&D landscape

iiCON has been working to develop the North West's world-leading infection R&D capabilities. The Capacity Development Centre at Pembroke House is playing a central role in developing the local, national and international workforce required for the future of public health and translational research.

The centre's inaugural event was held on the 7th November 2022 and featured a talk on antimicrobial resistance by Dame Sally Davies as part of LSTM's 125th anniversary lecture series.

Other initiatives to advance the sector's skills and capabilities include iiCON's expert team presenting a series of masterclass lectures and workshops via the Bloomsbury Consortium platform.

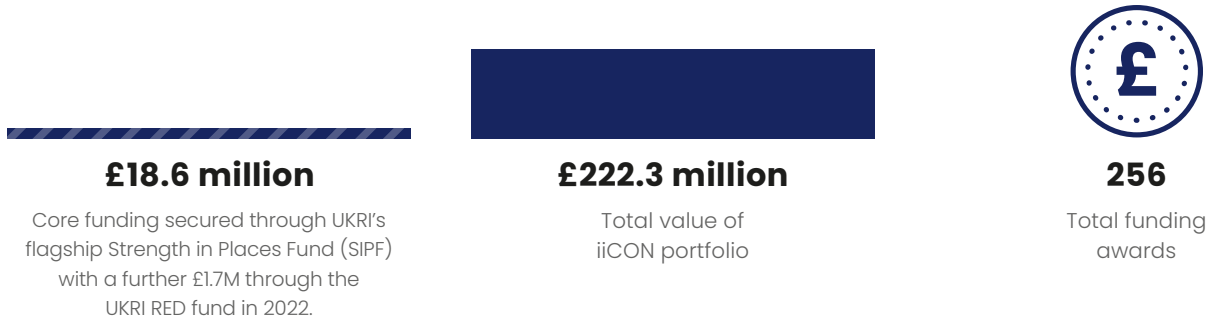
Capital Contracts

iiCON has secured capital investment of £27.46M over the past four years. Key capital projects under development include an in-patient human challenge facility (HCF) at LSTM's Accelerator Building. A £4.7 million grant from Research England and a £2 million grant from The Pandemic Institute has been secured to support this significant development.

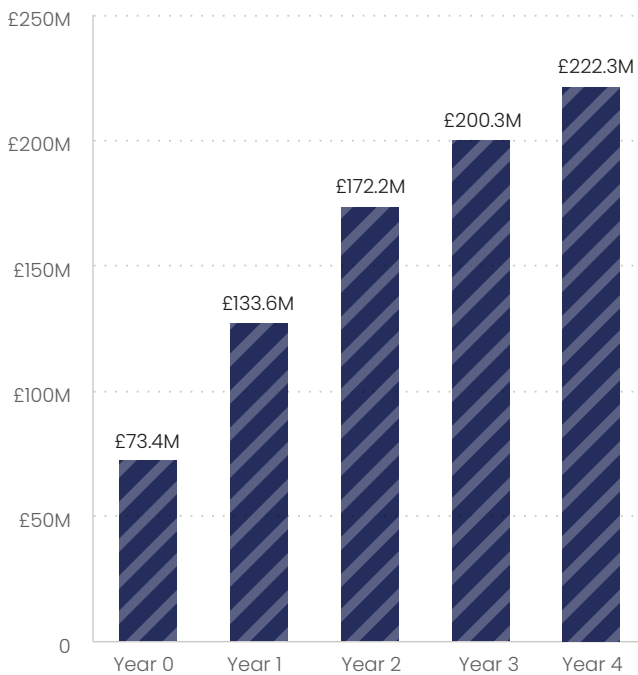
LSTM's HCF will become the largest academic in-patient human challenge isolation facility in the UK, working in partnership with the Liverpool University Hospitals Foundation Trust and The University of Liverpool to increase national capacity for human infection research. iiCON is directly funding expansion of the unit's activity to include a challenge model for multi-drug resistant tuberculosis, alongside support for commercialisation of the unit's activity.



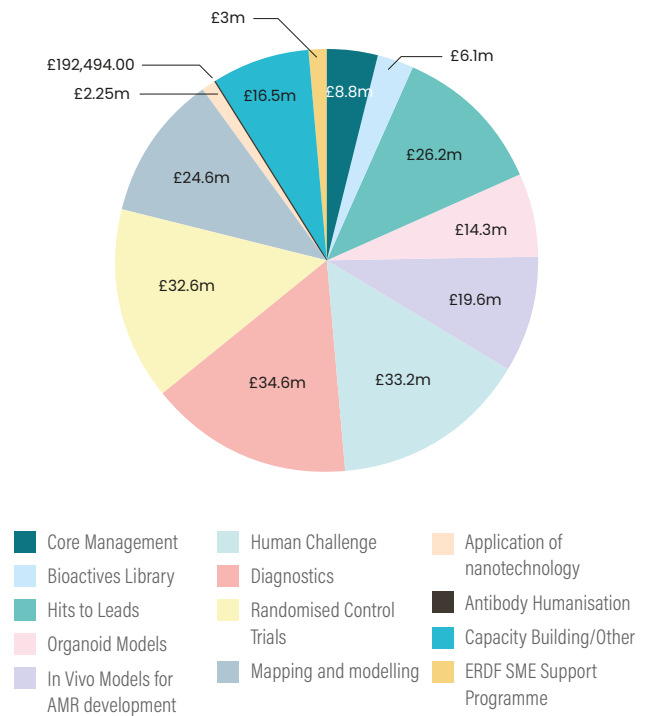
Leverage & Scale Of Programme



Funding income by year



Funding by platform



Steering Group

Professor Janet Hemingway

Professor Janet Hemingway CBE FRS is the former Director of Liverpool School of Tropical Medicine (LSTM). She is the founding Director of iICON: Infection Innovation Consortium, CEO of iiDiagnostics, and Professor of Tropical Medicine at LSTM. She is a Past President of the Royal Society of Tropical Medicine and Hygiene.

Dr Jonathan Hague

Dr Jonathan Hague, Head of Clean Future Science and Technology for Unilever Homecare. Outside Unilever, Jon is Chairman of Penrhos Bio, a start-up biotech company that licences technology to eliminate harmful biofilms, is Chairman of the Liverpool City Region Innovation Board, and is a Trustee of the Society of the Chemical Industry.

Professor Steve Ward

Professor Steve Ward, Walter Myers Professor of Parasitology at Liverpool School of Tropical Medicine (LSTM). He has a role as an external advisor in Translational Science to a number of international organisations including the Medicines for Malaria Venture (MMV) and the German Centre for Infection Research (DZIF).

Dr Greg Whelan

Dr Greg Whelan MRCVS, Ph.D., Vice President Anti-infectives at Evotec leads the infectious disease operations at Alderley Park, Cheshire, and is part of the in vivo pharmacology leadership team.

We wish Dr Pia Thommes a happy retirement from her previous position as Vice President Anti-Infectives at Evotec.

Professor William Hope

Professor William Hope (UoL) (BMBS, FRACP, FRCPA, PhD), Dame Sally Davies Chair of AMR Research at the University of Liverpool. Professor Hope is a Fellow of the Royal Australasian College of Physicians and a Fellow of the Royal College of Pathologists of Australasia. He is a Fellow of the American Academy of Microbiology and European Society of Clinical Microbiology and Infectious Diseases.

Dr Sam Naghibi

Dr Sam Naghibi, PhD, is the Operations Manager at the Centre of Excellence for Long-Acting Therapeutics (CELT). In this role he is engaged with the strategic and operational aspects of the centre, supporting innovative activities and collaborations in the field of long-acting therapeutics.

Dr Tim Ellis

Dr Tim Ellis is the Funding and Technology Transfer Lead for LifeArc's Global Health Portfolio, and LifeArc's accountable lead for the iICON partnership.

Dr Mark Wigglesworth

Dr Mark Wigglesworth, founder and Chief Executive Officer for Alderley Lighthouse Labs Ltd, is a laboratory-based testing facility, specialising in human diagnostics. Mark has been part of leadership teams spanning collaborations with the Medical Research Council, Charles River Laboratories, Cancer Research UK, the European Laboratory Research and Innovation group, Imperial College BioDesign Engineering Industry Advisory Board, Bionow, the UK governments Lighthouse Laboratory Test and Trace network.

Dr Peter Jackson

Dr Peter Jackson, CEO, Inflex Therapeutics. Dr Peter Jackson is an experienced UK-based serial entrepreneur in the life sciences sector. Dr Jackson is a member of the Project Advisory Group for NHS England and NICE on the new UK antibiotic reimbursement trial and is a member of a UKRI/BBSRC panel reviewing academic AMR investments and cross-departmental AMR strategy. He is a special advisor on AMR and pandemic preparedness to the Washington DC-based Milken Institute and has recently joined the board of the BEAM Alliance.

Dr Richard Fitzgerald

Dr Richard Fitzgerald, Director of the CRF and a Consultant Physician in Clinical Pharmacology and Therapeutics / General Medicine at the Royal Liverpool University Hospital. He is a qualified first-in-human principal investigator as part of the CRF's MHRA Phase I accreditation. Richard is also an honorary senior lecturer in the Wolfson Centre for Personalised Medicine, where his major research interests include stratified therapies in cardiovascular disease, optimisation of anti-platelet therapy, adverse drug reactions and systematic reviews and meta-analyses.

Dr Mike Strange

Dr Mike Strange, LifeArc Head of Global Health. Mike oversees LifeArc's three Global Health Translational Challenges in: Antimicrobial Resistance, Neglected Tropical Diseases and Emerging Viral Threats. These challenges aim to reduce the burden of infectious diseases by enabling the translation of scientific innovations, accelerating their path to deployment in underserved populations. Mike ended this role August 2024.

iiCON Advisory Panel 2024

Helen Jamet

Deputy Director, Vector Control Bill & Melinda Gates Foundation

John Whaling

Lead Officer - Innovation & Commercialisation, Liverpool City Region Combined Authority (LCRCA)

Lorna Green

CEO, LYVA Labs

Dr Peter Gallagher

Board-level FMCG R&D Executive successfully developing and executing breakthrough global business strategies with established and emerging technologies to deliver innovative product solutions

Jo Pisani

Strategic Advisor, Non-Executive Director and Charity Trustee

Norman Molyneux

Acceleris Capital founder, Strategic Advisor

Dr Lloyd J. Payne

D.Phil, President and Chief Executive Officer of ArrePath, a Princeton University spin-out biotech company harnessing imaging and AI/ML technologies to discover and develop new classes of anti-infectives

Professor Mark Sculpher

Professor of Health Economics and Director of the Centre for Health Economics, University of York. He is also Co-Director of the Policy Research Unit in Economic Evaluation of Health and Care Interventions, a programme of research for the UK Department of Health and Social Care funded by the National Institute for Health Research (NIHR)

Dr Kath Mackay

Director of Life Sciences for Bruntwood SciTech – the UK's leading property provider dedicated to driving the growth of the UK science and technology sector

Nicola Wilson

Merseycare



A Global Centre of Infection R&D Saving Lives by Supporting Innovation

iiCON is a world-leading collaborative infectious disease R&D programme established in 2020. It brings together industry, academia, and the NHS in a concerted effort with a clear aim: to combat the growing global threat posed by infectious diseases and save lives through collaborative innovation.

The consortium is revolutionising the discovery, development, and rapid deployment of new antimicrobial products, diagnostics, and therapeutics – bringing these to patients and communities more quickly, safely, and affordably.

To find out more about iiCON or explore opportunities to collaborate, please contact us at:

iicon@lstm.ac.uk