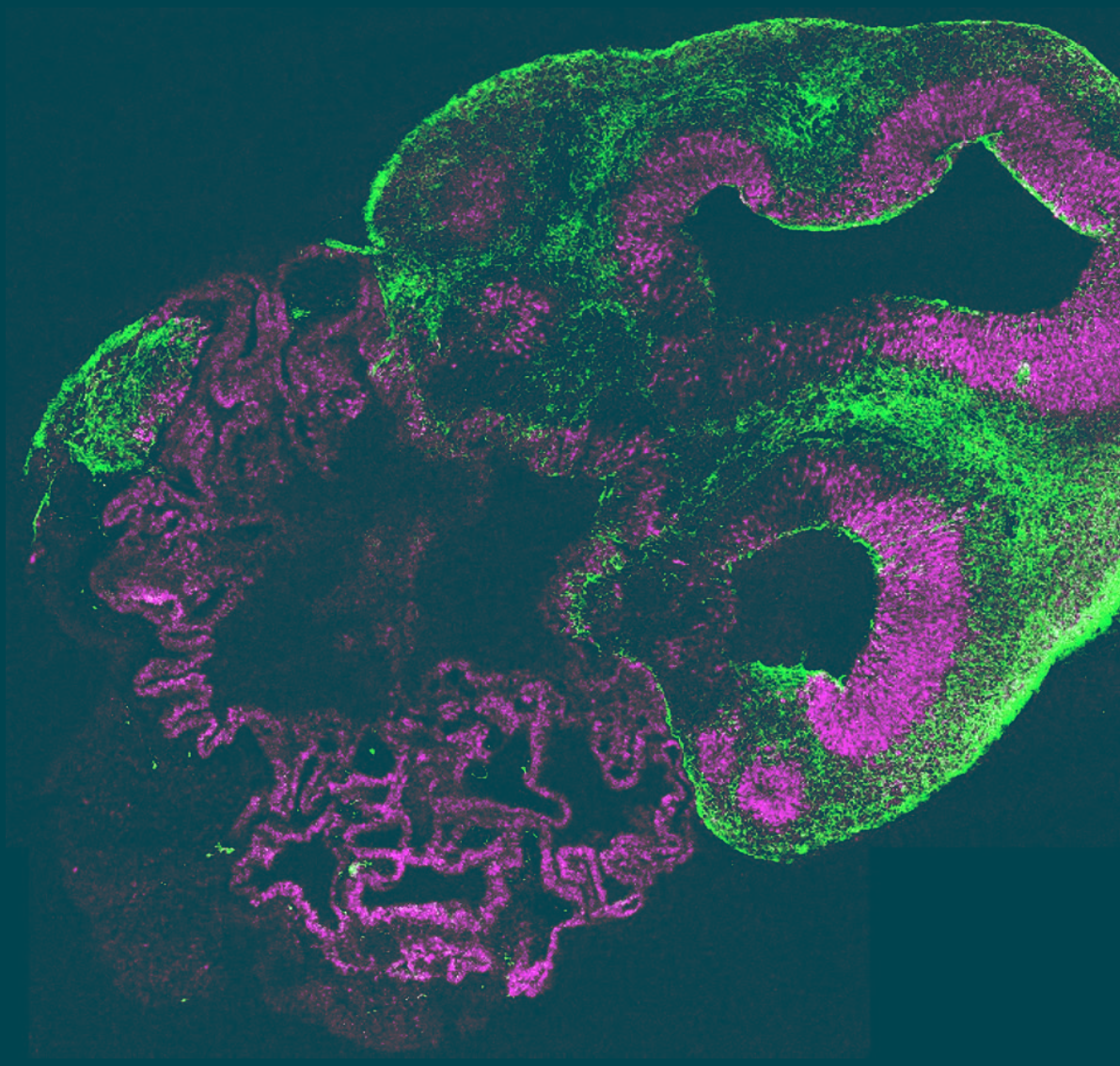
LifeArc

Expanding horizons

Realising the potential of MRC science



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LifeArc

LifeArc looks after the MRC's intellectual property and technology transfer needs.

This brochure brings you up to date on our latest work for the MRC and on the achievements of some of the scientists we support.

Inside this update

Overview
Let's talk about the opportunities 04

Life, re-engineered
Synthetic genomics, Dr Jason Chin 06

Collaborating to conquer Alzheimer's disease
Drug discovery, Dr Leo James 08

The burden of cardiomyopathies
AI and gene therapy, Dr Jaya Krishnan 09

Modelling the human brain
Tools for research, Dr Madeleine Lancaster 10

Point of care testing for tuberculosis
Rapid assay, Associate Professor Jayne Sutherland 12

A successful industrial partnership
Structural biology, Dr Chris Tate 13

Staying at the cutting edge
The Mary Lyon Centre, MRC Harwell 14

Unlocking value
The MRC Reagents Catalogue 16

Meet the team
The people behind your LifeArc services 18

Produced by LifeArc
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Cover image: Choroid plexus organoid in culture, Lancaster Lab

Key outcomes - 2018/2019

Commercialisation income

£21.4m

Identification of new opportunities and due diligence

55
new technology disclosures reviewed and assessed

Translational development: Development Gap Fund

£112,654
awarded

Intellectual property management

9
new patents filed

563 assets:

- **146** patented assets
- **7** technology disclosures under review/ development
- **69** non-patented assets
- **341** Catalogue reagents

Partnering activity

23
new licence agreements

MRC Reagents Catalogue

£810k
total income

16
new hybridomas deposited

Financial performance

139
MRC inventors received awards

1000+
MRC invoices and accruals processed

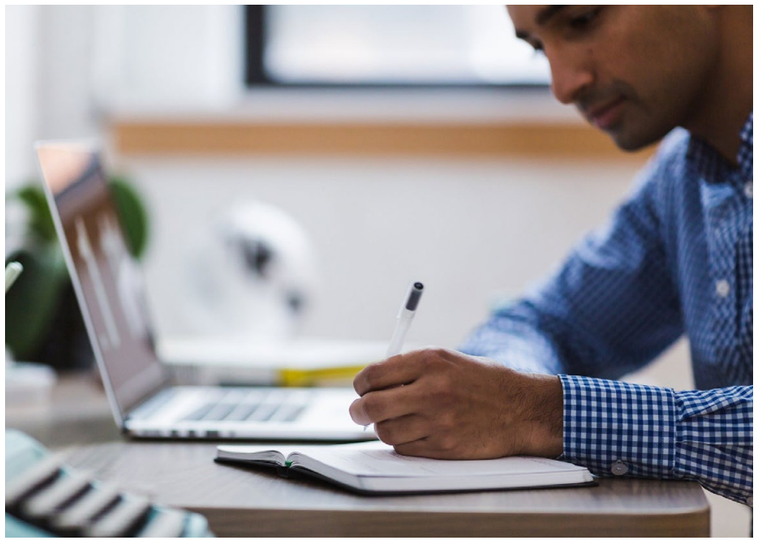
Contracts and advice

350
agreements negotiated/signed

Let’s talk about the opportunities

Everything starts with a conversation and we are keen to hear about your latest work.

Translating science is a long process, and LifeArc can provide support at every stage.



At LifeArc, we are here to help you make the most of your discoveries. Like you, we want to see the innovative life science research supported by the MRC having a real impact, contributing to the larger scientific endeavour and benefiting humanity as widely as possible. We can also help you with funding, but it’s about so much more than that. Translating science is a long process, and LifeArc can provide support at every stage.

Advice and development

As part of our technology transfer service for the MRC, we will assess the opportunity and help protect your invention if appropriate. We can also help you develop it further, and/or commercialise it.

LifeArc can provide support throughout the process, helping you with confidentiality and material transfer agreements, your early discussions with industry, and eventually with licensing agreements and spin-outs.

If you have made a discovery, created a new technology or developed new materials – examples would be a prototype device, a potential therapeutic agent or diagnostic, or a novel drug target – please contact us as soon as possible.

How we work

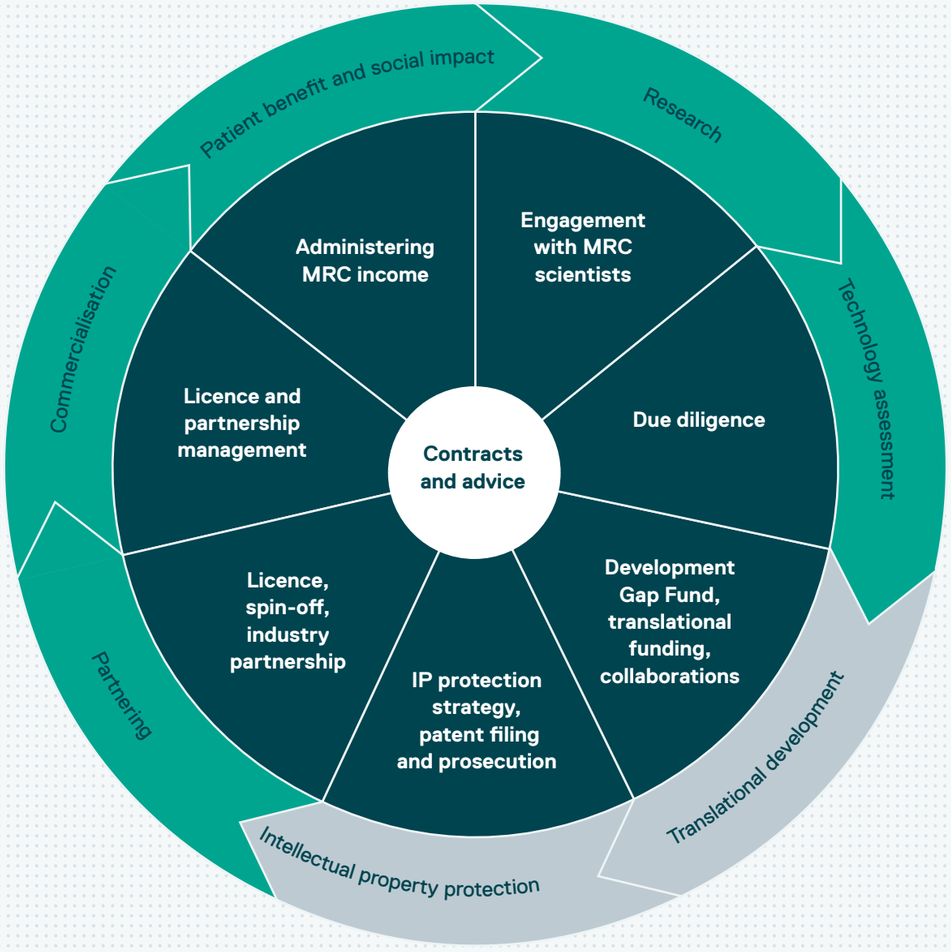
Each MRC scientist is assigned a LifeArc business manager, who will keep in regular contact with you about your research. They can advise on its commercial potential, which may lead to an improvement in human health or facilitate further translational research.

Your business manager is supported by a diverse team of professionals at LifeArc with a wealth of legal, finance and intellectual property management expertise.

Please do keep telling us about your latest work, so we can help you to realise its full potential.

Meeting up

We run regular intellectual property (IP) clinics at your MRC Institute. Watch for announcements with details of our next visit. There is also information on our website at **lifearc.org**



Translating your discoveries for impact

We are here to support your team at every stage of the technology transfer process, whether that means meeting you on site, assessing the potential of your discoveries, helping you secure funding and partners, or protecting intellectual property (IP). Throughout, LifeArc can handle contractual details and offer expert advice.

Key technologies

Drug discovery	Software
Diagnostics	Synthetic biology
Medical devices	Platform technologies
Data	Research tools

● LifeArc activities ● Technology transfer process ● Optional activities

Dr Jason Chin and colleagues have created the first viable organism with entirely re-engineered DNA, in an achievement that has been hailed by their peers as a landmark in the emerging field of synthetic genomics.

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Life, re-engineered

When MRC researchers achieved a new milestone in the emerging field of synthetic genomics, LifeArc set this early-stage technology on a secure commercial path.

Dr Jason Chin and colleagues have created the first viable organism with entirely re-engineered DNA, in an achievement that has been hailed by their peers as a landmark in the emerging field of synthetic genomics.

The team, based at the MRC Laboratory of Molecular Biology (LMB) in Cambridge, has produced the largest artificially-created genome to date, and the most complex: Syn61, a strain of *E. coli* with a fully synthetic genome.

In addition to the pure scientific value of this work, there is scope for interesting industrial applications. *E. coli* is already widely used in research and in the production of biopharmaceuticals (accounting for 30% of all approved therapeutic proteins), alcohols, biofuels, organic acids and many other products.

Against this background, LifeArc's team carried out a market analysis to shed more light on the commercial potential.

Although research in the lab has been underway for many years, development of this new technology for practical use is still at an early stage. This is a crucial time to secure intellectual property rights, along with funding to take the technology closer to market.

Protecting intellectual property

The creation of Syn61 was a long and arduous task, based on techniques that the LMB team developed over time.

The first step for LifeArc was to assess whether the work was patentable and whether patent rights would help boost the commercial offering in this case.

Following this due diligence, LifeArc worked with Dr Chin's group to file a priority patent application that covers Syn61 and the molecular alterations that led to its development.

Looking ahead, there are various commercial possibilities to explore. One of these opportunities is the potential to overcome existing issues with the industrial use of *E. coli*, such as infection of cultures by bacteriophage (phage), which can destroy productivity and the quality of valuable bioproduct. Phage infection is difficult to prevent and the vulnerability of the bacterial culture is magnified by its high density and genetic homogeneity. Consequently, there is significant need for a strain of *E. coli* that is resistant to phage infection.

Support for translation

£112,654

Development Gap Fund grant awarded

Funding for further research

There is more work to be done before this promising idea becomes a realistic business proposition. With help from a LifeArc business manager, the research group has been awarded a Development Gap Fund (DGF) grant of £112,654 to further develop the technology to a stage where it would be more likely to attract licensees.

Further molecular changes to Syn61 are expected to generate new intellectual property, and LifeArc will continue to seek downstream collaborators and develop a marketing plan to enable the licensing of this technology to industry.

References: Blount BA, Ellis T. Construction of an *Escherichia coli* genome with fewer codons sets records. Nature. 2019;569(7757):492-494.

Fredens J, Wang K, de la Torre D, Funke LFH, Robertson WE, Christova Y, Chia T, Schmied WH, Dunkelmann DL, Beránek V, Uttamapinant C, Llamazares AG, Elliott TS, Chin JW. Total synthesis of *Escherichia coli* with a recoded genome. Nature.2019;569(7757):514-518.

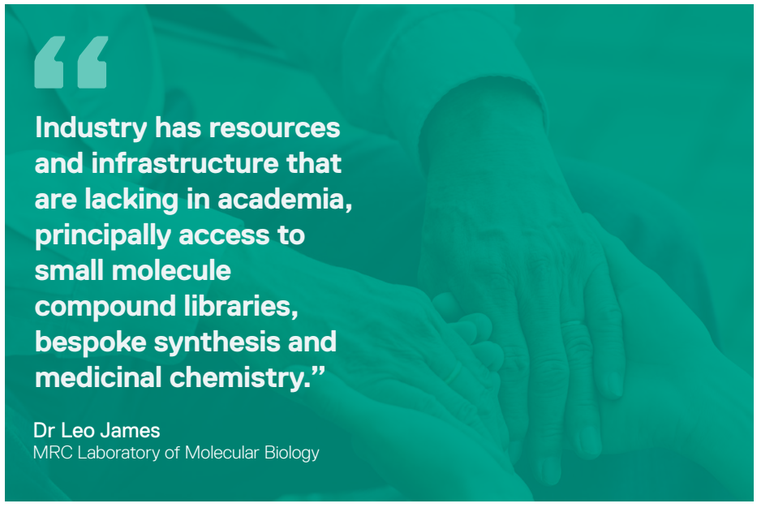
About the Development Gap Fund

The Development Gap Fund is an MRC fund administered by LifeArc.

It supports small-scale studies, building upon research in MRC institutes, to provide proof of concept for translational projects and facilitate commercialisation.

A LifeArc business manager assists the investigator in preparing a proposal, and presents it to the fund's expert panel for consideration.

If you are interested in applying for funding, please visit our website at **lifearc.org** to learn more.



Collaborating to conquer Alzheimer’s disease

LifeArc is supporting MRC scientists who want to see their discoveries go from the bench to the bedside.

Age-related dementia is a leading cause of disability and dependency among older people and in addition to the personal toll, there are significant social and economic costs. Alzheimer’s disease may contribute to between 60% and 70% of dementia cases. It remains an unmet therapeutic need because at present, we have no disease-modifying treatment to prevent or halt the course of this condition.

Now, a successful relationship between an MRC laboratory, two universities, and a global pharmaceutical company may result in the development of novel drugs against Alzheimer’s disease and other age-related dementias, with huge potential benefits.

Novel assay for a key protein

Intracellular accumulation of the cytoplasmic protein, tau, is thought to be associated with Alzheimer’s disease and other dementias such as supranuclear palsy and chronic traumatic encephalopathy.

Previous research, led by Dr Michel Goedert at the MRC Laboratory of Molecular Biology (LMB), has shown that misfolded tau can spread between cells, inducing a ‘prion-like’ propagation of the misfolded state in recipient cells.

A collaboration between the labs of Dr Leo James at the LMB and Dr Will McEwan at the University of Cambridge led to the development of a novel and sensitive tau seeding assay. In an iterative process, molecules can be screened using this assay to identify and design novel chemical entities that can inhibit tau seeding. Further *in vitro* and *in vivo* studies on these molecules are carried out to assess their characteristics. This work can ultimately lead to the identification of suitable lead molecules which can be taken forward in preclinical and clinical drug development.

This process of screening molecules using the assay, and then developing them for future therapeutic use, will be possible thanks to a collaborative effort with academic and commercial partners.

Working in harmony

To begin this collaboration, LifeArc assisted in establishing an agreement with the University of Dundee, under which the assay has been applied to screen more than 20,000 compounds and identify promising candidate chemotypes for further investigation.

In addition, after the University of Dundee secured participation and funding from Takeda as an industrial partner, LifeArc helped establish a collaboration agreement to develop pre-clinical candidate drugs that might inhibit tau seeding. These partners include the James lab at LMB, Dr William McEwan’s laboratory at the University of Cambridge and the University of Dundee’s Drug Discovery Unit.

These agreements had to ensure that the interests of the academic partners, and their freedom to research and publish, were protected. At the same time, the commercial viability of the project also had to be safeguarded, so that any molecules identified could successfully be developed into therapeutic agents in the future. This balance can be difficult to achieve, and LifeArc has the expertise to facilitate a speedy conclusion of negotiations and secure equitable terms in agreements for academics and the MRC.

Going forward, the success of this project lies in the synergy between all partners. where each contributes their expertise and resources. The James and McEwan labs contribute the assay, mouse models and understanding of the fundamental biological processes underpinning Alzheimer’s disease and tau pathology. The University of Dundee contributes its medicinal chemistry expertise, and Takeda provides its industrial experience and a viable route to market.

References: Goedert M, Falcon B, Clavaguera F, Tolnay M. Prion-like mechanisms in the pathogenesis of tauopathies and synucleinopathies. Curr Neurol Neurosci Rep. 2014; 14(11):495.

McEwan WA, Falcon B, Vaysburd M, Clift D, Oblak AL, Ghetti B, Goedert M, James LC. Cytosolic Fc receptor TRIM21 inhibits seeded tau aggregation. Proc Natl Acad Sci USA. 2017;114(3):574-579.

People living with dementia

50m
worldwide

152m
cases by 2050

$818bn
annual burden of dementia

Source: WHO. 2019. Dementia key facts

The burden of cardiomyopathies

A new treatment now promises relief for patients.

Hypertrophic cardiomyopathy (HMC) is a commonly inherited disease and results in shortness of breath, chest pain, and heart failure. It is the most common cause of sudden death in children and adults under the age of 35. First line medications to treat HMC include beta-blockers and diuretics; however, these are not curative. Surgical interventions are also available, but these come with increased risk and cost.

Dilated cardiomyopathy (DCM) is one of the most common causes of systolic heart failure worldwide and the leading indication resulting in heart transplants. Familial DCM accounts for 50% of cases, with patients first receiving a pacemaker or defibrillator prior to heart transplantation.

Treating HMC and DCM comes with a high financial cost to the healthcare system due to the expensive and complicated surgical interventions, and with significant personal risk and burden to the patient. Consequently, there is a significant unmet need in treating these diseases.

Work from the lab of Dr Jaya Krishnan, formerly a principal investigator at the MRC London Institute of Medical Sciences (LMS) provided evidence that two novel pathways are involved in HMC and DCM, and led to the identification of two targets for promising therapeutic intervention.

About the technology

Based on those two targets, they identified two agents that could ultimately lead to new treatments for heart disease. These are antisense oligonucleotides (ASOs), which inhibit SINT1 (stress induced non-coding RNA transcript 1) and miR27b (microRNA miR27b-5p). When administered in mice, these ASOs demonstrated a reduction in stress-induced cardiac pathogenicity and significantly improved overall survival in diseased mice.

Taking the technology forward

After his time at the LMS, Dr Krishnan moved to Goethe University and continued development of the ASOs in his new lab. Once the ASOs were sufficiently tested, two patent applications were filed in the name of the MRC.

LifeArc then led the negotiations to license the patent applications to a German company, Genome Biologics, to further develop the technology. Genome Biologics combines AI-based machine learning with a proprietary cell engineering platform, to reduce drug development time and cost.

Genome Biologics raised significant investment and demonstrated a viable development pathway for these therapies. The agreement LifeArc put in place includes an upfront payment plus downstream royalties on net sales once the product reaches the market.

References: Bischof C, Krishnan J. Exploiting the hypoxia sensitive non-coding genome for organ-specific physiologic reprogramming. Biochim Biophys Acta. 2016;1863(7 Pt B):1782-1790.

Mirtschink P, Bischof C, Pham MD, Sharma R, Khadayate S, Rossi G, Fankhauser N, Traub S, Sossalla S, Hagag E, Berthonneche C, Sarre A, Stehr SN, Grote P,Pedrazzini T, Dimmeler S, Krek W, Krishnan J. Inhibition of the hypoxia-inducible factor 1α-induced cardiospecific HERNA1 enhance-templated RNA protects from heart disease. Circulation. 2019;139(24):2778-2792.

Modelling the human brain

Candidate drugs to treat the central nervous system could be screened with three-dimensional brain tissue grown in the laboratory. We accelerated this technology's journey to market, so it can be more widely used for research, drug development and ultimately, to benefit patients.

The blood brain barrier (BBB) is very effective at excluding pathogens and toxins, but it also blocks access to certain therapeutic agents.

It is difficult to confidently predict whether candidate drugs will cross the BBB and too often, the answer does not become apparent until a Phase 1 clinical trial is underway, at which point there has already been significant investment and commercial risk.

Dr Madeline Lancaster and her team at the MRC Laboratory of Molecular Biology (LMB) in Cambridge might have the answer, in the form of cerebral and choroid plexus organoids, which are self-organising, three-dimensional cell cultures generated from human pluripotent stem cells. These organoids, nicknamed mini-brains, provide a miniaturised and simplified version of specific brain tissues.

Previous systems have tried to mimic the choroid plexus, but lacked such complex tissue architecture or comparable functionality.

Focus on the choroid plexus

Part of the team's focus is on the choroid plexus, a secretory tissue in the brain that forms a protective epithelial barrier and secretes cerebrospinal fluid (CSF). However, little is known about the regulation and permeability of this barrier.

The team has developed a protocol to generate three-dimensional choroid plexus organoids, offering an unprecedented and reliable way to study the functions of this structure and its permeability to compounds, peptides and proteins.

Patents and partnership

LifeArc has helped to accelerate this technology's journey out of its home lab so it can find wider use as soon as possible.

After careful assessment of the published literature and patent filings, LifeArc filed a patent application directed at product claims (choroid plexus organoids), methods of production (protocol for making the organoids) and methods of use (assessing the BBB permeability of potential therapeutics).

> "We are very excited about the research directions these new organoids will enable. Cerebrospinal fluid is understudied and yet its function in cleaning the brain of toxic by-products and providing much needed nutrients is vital. These organoids will open up new avenues in understanding how this vital fluid is made and how drugs get into the brain."
>
> **Dr Madeleine Lancaster**

We then started discussions with STEMCELL Technologies, a global Canadian biotechnology company with a local manufacturing facility in Cambridge. The result was an exclusive patent and know-how licence to develop and sell choroid plexus organoids, associated culture media kits and screening services.

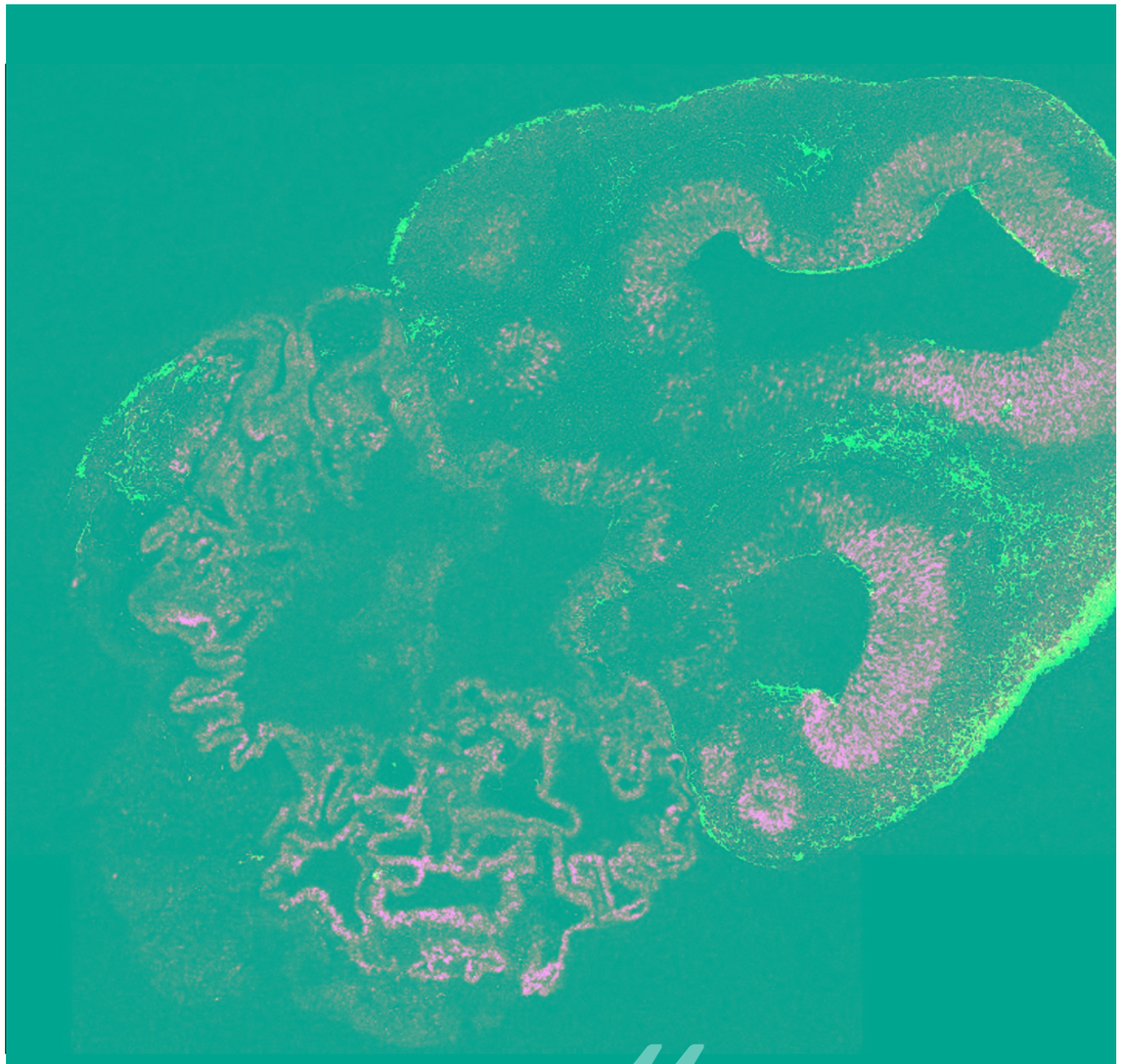
The company will now work to optimise organoid production and refine the associated culture media, to enable wide uptake of the technology by the scientific research and drug discovery communities.

References: Benito-Kwiecinski S, Lancaster MA. Brain organoids: Human neurodevelopment in a dish. Cold Spring Harbor Perspectives in Biology. 2019; 25:a035709. epub ahead of print.

Lancaster MA, Knoblich JA. Generation of cerebral organoids from human pluripotent stem cells. Nat Protoc. 2014;9(10):2329-2340.

See for yourself

The Lancaster lab brings its message to the public through accessible and engaging online videos. Find links to BBC Future, TedXCern and more on the lab's website at **www2.mrc-lmb.cam.ac.uk/groups/lancaster/**



©Lancaster Lab

> **"The ability to generate choroid plexus organoids will allow our customers to make important advances in treating neurological disease."**
>
> Dr Erin Knock
> Senior Scientist, STEMCELL Technologies

Point of care testing for tuberculosis

A rapid diagnostic test for tuberculosis would benefit people in areas of the world with the weakest healthcare systems.

Every year, there are an estimated 10 million new cases of tuberculosis (TB) worldwide, according to the World Health Organization (WHO). Missed diagnoses lead to ongoing transmission and poor treatment outcomes for individual patients.

Many patients present to local clinics in under-resourced areas, where a simple and inexpensive point-of-care triage test would have a big impact. This test could support an initial diagnosis of TB and single out those patients who need onward referral for confirmation of TB infection.

Intellectual property management

Associate Professor Jayne Sutherland and her team have been working on such a test at the MRC Unit The Gambia at the London School of Hygiene and Tropical Medicine. LifeArc has worked with Associate Professor Sutherland for the past five years, filing a patent application and prosecuting it to grant in a number of territories.

The team generated a biosignature for active TB among total respiratory infections, using host markers present in sputum samples from patients with symptoms suggestive of TB. This test can be used to detect TB in patients regardless of HIV status (which often confounds diagnosis) and in its present format, has a sensitivity and specificity that meet the WHO target product profile for a TB triage test.

Funding for development

An initial pilot study was conducted on 50 frozen sputum samples (25 from patients with confirmed TB and 25 with a diagnosis of other respiratory diseases, ORD).

LifeArc then assisted in securing £100,000 of MRC Development Gap Funding in 2017, to enable analysis of samples from a further 373 patients with confirmed TB and 315 patients with ORD, greatly strengthening validation data for the test.

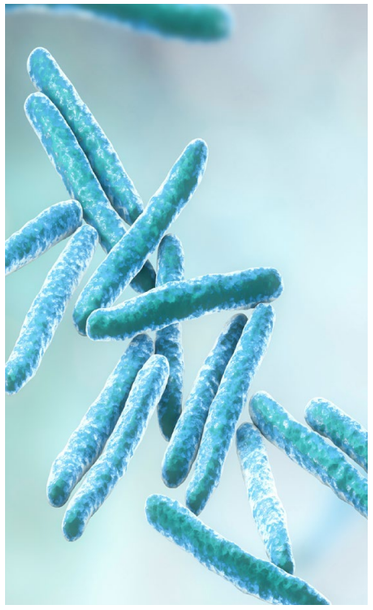
Finding an industrial partner

The next stage is getting the assay into a form that can be used in the field, while maintaining its sensitivity and specificity. The team is working with an industrial partner to develop a lateral flow device, which is a dipstick test that gives a quick visual answer. Home pregnancy tests are a familiar example of this technology.

In addition to being affordable, tests like this are easy to use, provide an answer within minutes, do not require specialised equipment, and are stable at room temperature.

LifeArc advised on the selection of a specialist technology developer, Mologic, to produce the prototype device. Our recommendation was based on the company's strong record in designing diagnostic solutions for resource-limited settings.

We have negotiated a service agreement for the production of a lateral flow diagnostic prototype, and LifeArc will continue looking for ways to support this promising work.



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WHO goals 2018-2022

40m

People treated for TB in this period

$13bn

Annual spend for universal access to TB diagnosis, treatment and care

$2bn

Annual spend for TB research

Source: WHO Global tuberculosis report, 2019

References: Chegou NN, Sutherland JS, Malherbe S et al, on behalf of the AE-TBC consortium. Diagnostic performance of a seven-marker serum protein biosignature for the diagnosis of active TB disease in African primary healthcare clinic attendees with signs and symptoms suggestive of TB. Thorax. 2016;71(9):785-794.

Ota MO, Mendy JF, Donkor S, Togun T, Daramy M, Gomez MP, Chegou NN, Sillah AK, Owolabi O, Kampmann B, Walzl G, Sutherland JS. Rapid diagnosis of tuberculosis using ex vivo host biomarkers in sputum. Eur Respir J. 2014; 44: 254-257.

A successful industrial partnership

An MRC spin-out company established in 2007 continues to be commercially successful while pushing the boundaries of structural biology in partnership with the LMB.

G-protein-coupled receptors (GPCRs) are one of the most important target drug families.

Approximately 30-40% of drugs marketed across all conditions act on G-protein-coupled receptors (GPCRs). They are one of the most important drug target families that are currently known.

These cell surface receptors, found in all eukaryotes, are ubiquitous – humans have more than 800 different GPCRs, each with a highly specific function.

Yet we still do not have a complete understanding of their structure and function and they can be fiendishly difficult to work with as they are unstable in isolation, often preventing structure determination.

Pioneering team

Dr Chris Tate at the Laboratory of Molecular Biology (LMB) in Cambridge has been a pioneer in understanding GPCRs.

Building on previous collaborations with the MRC spin-out company Sosei-Heptares (see right), Dr Tate's lab previously solved two structures of GPCRs coupled to heterotrimeric G proteins: the adenosine A_{2A} receptor coupled to G_s and the serotonin $5HT_{1B}$ receptor coupled to G_o.

Building on the legacy

Now, one of the lab's new projects will contribute to a greater understanding of GPCR biology by investigating how GPCRs form large complexes in the cell, potentially improving future drug design. Sosei-Heptares is funding a three-year post-doctoral appointment in support of this work.

Thus, the long-standing collaboration between the lab and a commercial partner continues to add value to proprietary technologies, while pushing the boundaries of GPCR structural biology and giving LMB scientists the freedom, intellectual space and resources to pursue innovative approaches.

References: Carpenter,B, Nehmé R, Warne T, Leslie AG, Tate CG. Structure of the adenosine A_{2A} receptor bound to an engineered G protein. Nature. 2016;536(7614):104-107.

García-Nafría J, Nehmé R, Edwards PC, Tate CG. Cryo-EM structure of the serotonin 5-HT_{1B} receptor coupled to heterotrimeric G_o. Nature. 2018; 558(7711):620-623.

GPCR facts

800+

GPCRs in humans

A bit of history

Sosei-Heptares' technology platform covers the creation of thermostabilised G-protein coupled receptors (GPCRs) and their use for drug screening and structure-based drug design.

The company was originally formed in 2007 as Heptares, a spin-out from MRC that was based on pioneering technology that originated at the LMB. Dr Tate and Dr Richard Henderson were among the founding members of the company.

Early stage development of this technology was funded by the MRC Development Gap Fund (DGF) and the company was originally based in LifeArc premises.

In 2015, the company was acquired by Sosei and became a wholly-owned subsidiary of Sosei.

Staying at the cutting edge

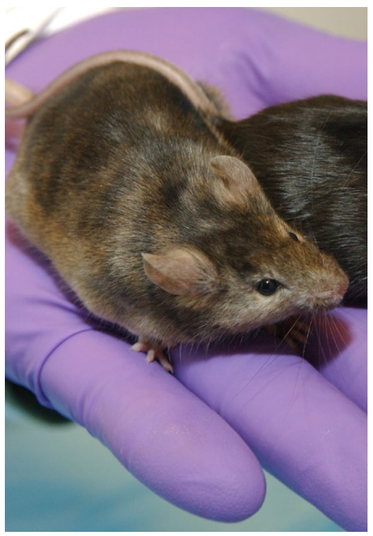
LifeArc helped a world-leading transgenic mouse service facility gain access to a key gene editing technology, by leading complex licensing negotiations.

The field of molecular biology has been revolutionised by the discovery of the gene editing tool, CRISPR/Cas9. By making it much faster and simpler to create transgenic models for research, CRISPR/Cas9 has opened many new avenues for exploration.

This technology is of key importance to the Mary Lyon Centre (MLC) at MRC Harwell, which is a national facility that provides expertise, tools and resources to generate and characterise genetically-altered mouse models for the scientific community. The MLC offers numerous services to academia and industry, including genome engineering of mouse models, advanced phenotyping and cryopreservation.

Weeks, not months

Traditional techniques to generate transgenic mouse models have been used for decades. However, these methods are slow and often unreliable. The advent of CRISPR/Cas9 genome editing meant that transgenic mouse models could be generated in weeks rather than months, with much greater efficiency and specificity.



> “Many UK researchers depend on the Mary Lyon Centre for high-quality controlled mouse lines that are simply too complex to make elsewhere – these important licences allow us to remain at the cutting edge of mouse genetics.”

Dr Sara Wells
Mary Lion Centre

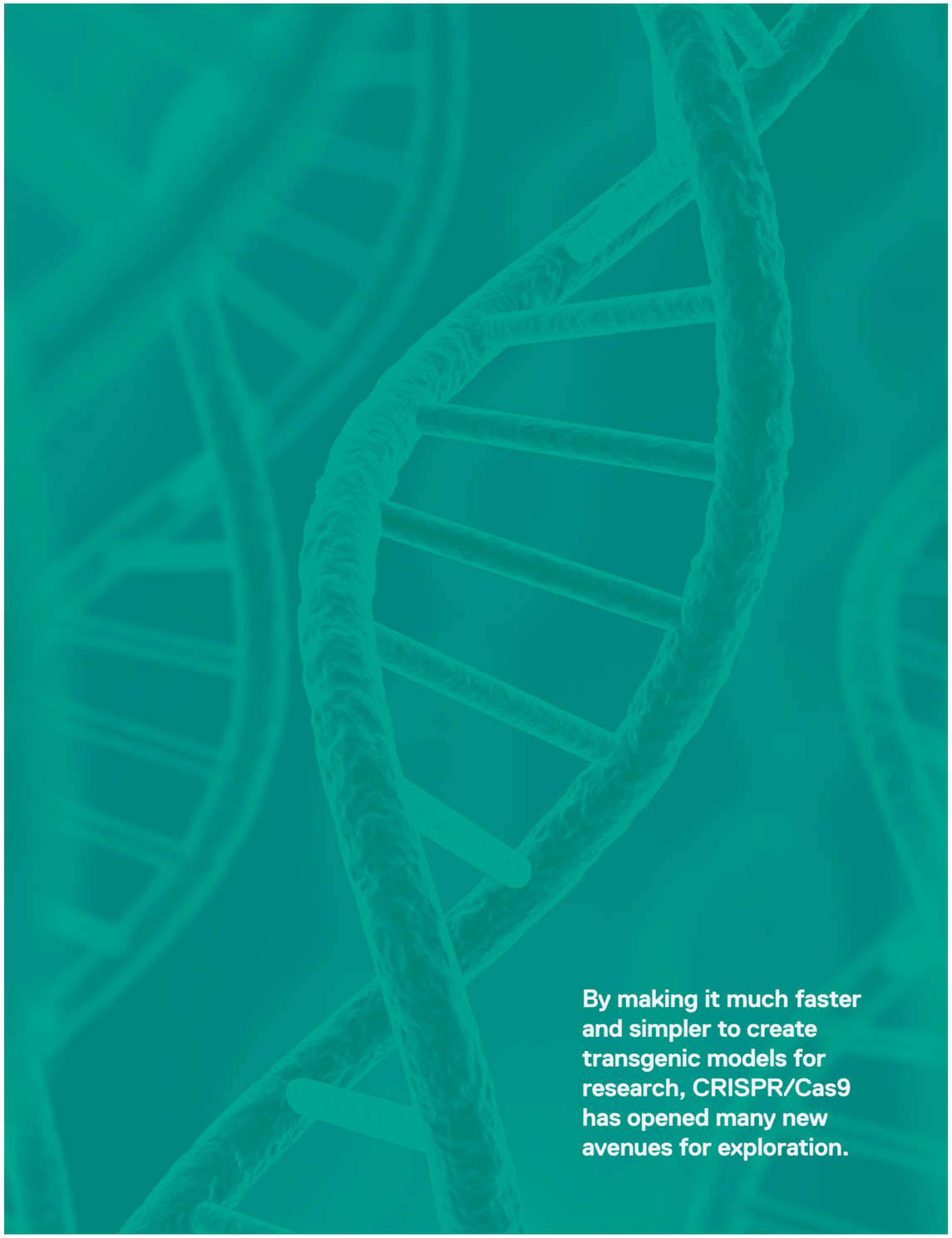
Successful negotiations

Most academic labs and mouse facilities use CRISPR/Cas9 tools under academic licences. However, as a service provider the MLC required a commercial licence to use this technology. Obtaining this licence would allow the MLC to offer transgenic mouse generation services for a fee to the scientific community, maintaining its competitive edge and reputation as a leading mouse facility.

The task of acquiring the right licences was more complicated than it might sound because two institutions claim patent rights over the original CRISPR/Cas9 invention.

Working with the MLC, LifeArc reviewed the highly complex patent landscape around CRISPR/Cas 9. LifeArc then approached and successfully negotiated freedom-to-operate licences to CRISPR patents for use in the generation of transgenic mice, from both relevant parties, with favourable terms for the MRC.

The MLC now has rights to generate and provide mice as a service in Europe, the USA and many other countries. Opening the MLC service to clients from all over the world allows the MLC to continue leading the way in high-quality transgenic mouse generation, built on the highest standards of animal welfare.



Income from research reagents generates more than £800,000 per year for MRC and other academic collaborators.

Unlocking value: the MRC Reagents Catalogue

That everyday tool in your lab may have greater worth than you realise, both for academic research and for commercialisation.

When you are focussed on the big ideas, it might be easy to overlook the value of the research tools that your lab has developed to enable your day-to-day work. These technologies may be so fundamental to your activities that you take them for granted.

Yet these research tools can have great value to other labs, reagents companies, and biotech or pharmaceutical companies who wish to use them for in-house research and development purposes.

Some examples of such technologies include:

— **Mouse, fly and cell lines**

— **Vectors**

— **Monoclonal hybridomas**

— **Polyclonal antibodies.**

If your lab has developed technologies like this, they may be eligible for inclusion in the MRC Reagents Catalogue, which has been developed to make these valuable research tools, generated by MRC scientists, accessible to the wider scientific community.

What's in the catalogue

LifeArc manages the MRC Reagents Catalogue on behalf of the MRC, ensuring ownership rights are respected and the reagents reach a broad audience.

The MRC Reagents Catalogue currently includes more than 300 research tools. Hybridoma cell lines that express monoclonal antibodies represent 67% of the catalogue. These are of interest to companies selling antibodies to researchers, as well as companies who can use them for research and development, hospital diagnostics or the provision of a service.

Another popular research tool is the NSO cell line, which can be used as a fusion partner in the generation of hybridoma cell lines for monoclonal antibody production, and generally to produce recombinant proteins. Many of the requests for this technology come from start-up companies that are at the early stage of developing new products. We're also exploring new business models, such as allowing contract research organisation (CROs) to use the NSO cell line as part of their services.

Animal models also attract significant interest from commercial partners. For example, the hTau.P301S mouse model, developed by Dr Michael Goedert at the MRC Laboratory of Molecular Biology (LMB), has been non-exclusively licensed to several pharmaceutical companies and to a preclinical CRO with expertise in central nervous system conditions and orphan diseases.

Partnership working

We work with a number of partner institutions that store, manage and fulfil requests for reagents. Two of these are the European Collection of Authenticated Cell Cultures (ECACC), run by Public Health England, for cell lines including hybridomas and Addgene, a non-profit plasmid depository, for vectors.

Academics can access the reagents for a nominal fee, while companies must negotiate a non-exclusive licence and pay royalties on sales, or annual fees to the MRC, to reinvest in research. In addition, income generated from such licences may be eligible for the MRC Award to Inventors scheme (for reagents created after 1 April 2012).

The most recent partnership is with Ximbio, the world's largest non-profit organisation dedicated to life science research reagents. LifeArc has facilitated this agreement and will be managing the collaboration on behalf of the MRC.

This arrangement will utilise Ximbio's capabilities to produce bulk quantities of the MRC's large portfolio of antibodies. It will also allow Ximbio to sell direct to consumers (academic and commercial life science researchers) a selection of MRC cell line models via its global platform —potentially enabling more research professionals to benefit from these valuable tools.

We're always looking to expand the MRC Reagents Catalogue, working closely with individual scientists and centres to identify research tools and facilitate the transfer of reagents. In the past year, we have coordinated the deposit of 16 new hybridomas to repositories including several hybridomas from Simon Hughes, MRC Scientist and Professor of Developmental Cell Biology at King's College London.

The bottom line

Depositing your reagents at the MRC Reagents Catalogue means that these research tools only need to be provided once, saving you from the burden of continued delivery and ensuring safe back-up storage. We will also make sure they reach a wider audience, by finding commercial partners while ensuring easy access for academic researchers.

Catalogue contents

300+
research tools

67%
of content includes hybridoma cell lines that express monoclonal antibodies

> "Having gone through major liquid nitrogen storage crisis, I really appreciate having a back-up storage of these valuable hybridomas."
>
> **Professor Simon Hughes,**
> King's College London

Partnership with Ximbio

> "Ximbio's global network, capabilities and values make it a natural partner to provide access to MRC reagents. This partnership will provide researchers with easier access to valuable research tools that could help to maximise its impact in life science research and development."
>
> **Dr Rob Buckle**
> Chief Science Officer, MRC

> "We are delighted to partner with the MRC. Research tools play a huge role in achieving scientific breakthroughs but are often overlooked. Through this partnership, we will be able to support the goal of the MRC to accelerate life science research."
>
> **Dr Robert Bondaryk**
> Global Head, Ximbio

Contact us

Do you have a candidate for the reagents catalogue? You can apply at **lifearc.org**

Meet the team

We can assist with a range of business matters relating to your research, whether it's understanding contracts, checking legalities or managing finance. Our team of experts is here to back you up, so let us take care of the small print while you get on with the science.

"If science, like art, is to perform its mission truly and fully, its achievements must enter not only superficially but with their inner meaning into the consciousness of people.' Very much with Einstein's statement in mind, we are here to help MRC science reach the widest possible audience. Please keep those technology disclosures coming."

Technology Transfer Team
Your business manager is your main point of contact for any questions about intellectual property protection, translational development and industry engagement.

01. Dr Georgia Gliki
Senior business manager

02. Dr Alexandra Esteras-Chopo
Business manager

03. François-Xavier Robert
Business manager

04. Dr Alex Templar
Business manager

Support team
Behind your business manager is a wider LifeArc team with diverse skills. Meet a few of our experts.

Ashwina Badiani
Finance administrator

Ashwina manages the purchase and sales ledger, processes sales invoices, requests purchase orders, and sends and receives patent invoices.

Her message to MRC scientists is: "Keep up the good work."

Suzanne Bye
Senior technology transfer administrator, Technology Transfer Team

Suzanne supports the business managers by looking after the records for their IP and agreement case loads.

"Thank you for taking the time to complete the boring-but-necessary documents that we send you!"

Gideon Gold
Financial controller, Finance Team

The Finance Team ensures all invoices for royalties and patents are processed, so Awards to Inventors are distributed efficiently.

"If you have any questions, please get in touch."

Mike Bond
Senior analyst, Opportunity Assessment Group

Mike's team helps LifeArc make decisions based on a rigorous assessment of the scientific and commercial landscape.

"LifeArc has a wealth of expertise in technology transfer, translation, funding, drug discovery and diagnostic development and, importantly, we are always happy to help."

Tony Chapman
Senior contracts manager, Legal Team

Tony ensures that our agreements enable (as applicable) the conduct, publication and translation of MRC research in a timely manner.

"LifeArc is here to help and involving us at an early stage helps minimise the (late) discovery of issues that delay completion of the required agreement."

Diana Sternfeld
Head of intellectual property, Technology Transfer Team

Diane manages external patent attorneys, reviews IP aspects of agreements and oversees maintenance of the IP database.

"Make sure you have agreed protection of ideas/development before you publish."

LifeArc

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Company number
LifeArc is a company limited by guarantee no. 2698321 incorporated in England and Wales.

Charity numbers
LifeArc is a charity registered with the Charity Commission for England and Wales no. 1015243 and a charity registered in Scotland with the Office of the Scottish Charity Regulator no. SC037861.

www.lifearc.org