



INTRODUCTION

Despite the challenges that the past year has brought for us all, we are grateful that it has been possible to find exciting new ways of working together with our partners.

As a biomedical research institute, we act as a catalyst and a driver, forming dynamic partnerships between academia and business to unlock the power of emerging discoveries. There has been significant growth this year in our own **in-house research programme**, both in the computational research and artificial intelligence team led by Namshik Han (p6) and the target discovery team led by Rebecca Harris (p7) and it is fantastic to see new collaborations with academics and industry partners across different disease areas.

We have also expanded the opportunities for entrepreneurs with the launch of a new Frame Shift Bio-incubator (p18) in the institute that works alongside the Start Codon Accelerator (p16). And the launch of Connect: Health Tech this year as a new University Enterprise Zone — which includes the Milner as a therapeutics hub on the biomedical campus — is extending our interdisciplinary reach across Cambridge (p14).

The institute is the headquarters of the Milner Therapeutics Consortium. Now with ten pharma partners and three academic partners, this has become one of the largest cross-sector Biomedical Consortia in the world working in target discovery across multiple disease areas and emerging technologies (p21). This is

enabling innovative collaborations (p22–23) that combine the strength of academia and industry and remain central to our long-term vision — to galvanise science into life-changing treatments.



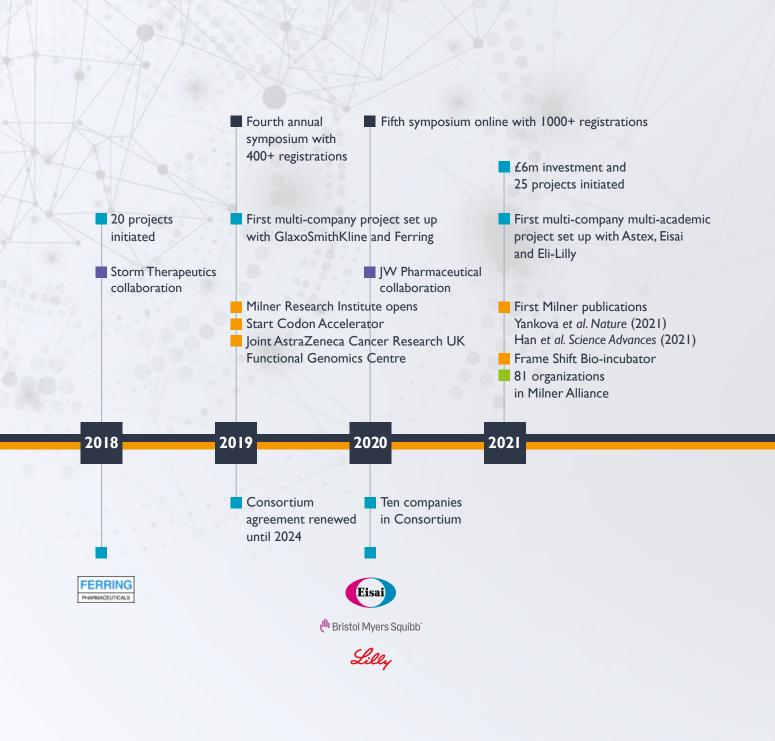
Dr Kathryn Chapman Deputy Director



Professor Tony Kouzarides

MILNER TIMELINE THE FIRST 6 YEARS





MILNER THERAPEUTICS INSTITUTE The Milner Therapeutics Institute encompasses both a research institute and a global therapeutic alliance for collaboration between academia and business. Jeffrey Cheah Biomedical Centre

RESEARCH INSTITUTE

The research institute is based in the new Jeffrey Cheah Biomedical Centre (JCBC) on the Cambridge Biomedical Campus, providing a physical environment for collaboration between academia and business, and acting as a hub for industry initiatives extending throughout the University. We provide a unique setting where pharma, biotech, start-ups and academics work together in a common space, creating a research environment that breaks down barriers between these sectors. We have strong links with the two other biology institutes based in the Jeffrey Cheah Biomedical Centre, the Wellcome MRC Cambridge Stem Cell Institute and the Cambridge Institute for Therapeutic Immunology and Infectious Disease.

The institute provides two paths for partnering and driving academic collaboration with business:

- ACADEMIC RESEARCHERS PARTNERING WITH PHARMA AND BIOTECH
- Centre for Pathway Analysis (p6)
- Joint Astra Zeneca-Cancer Research UK Functional Genomics Centre (p12)
- Milner Therapeutics Consortium (p21)
- Onco-Innovation programme at the Cancer Research UK Cambridge Centre (p10)
- Connect: Health Tech (Hub at the Biomedical Campus) (p14)

- ACADEMIC ENTREPRENEURS PARTNERING WITH VENTURE PARTNERS
- Start Codon Accelerator (p16)
- Frame Shift Bio-incubator (\$18)
- Connect: Health Tech (Hub at the Biomedical Campus) (p14)

GLOBAL THERAPEUTIC ALLIANCE

The Milner Therapeutics Institute has built a Global Therapeutic Alliance of 81 affiliated organizations comprising of pharma, biotech, venture companies and research institutions. The Milner Therapeutics Institute connects these affiliates with the Cambridge ecosystem, highlighting partnership opportunities at an annual Therapeutics Symposium and our events throughout the year.

- Milner Therapeutics Consortium (p21)
- Affiliated Companies (p24)

- Affiliated Venture Partners (p26)
- Affiliated Research Institutions (p26)

CENTRE FOR PATHWAY ANALYSIS

The Centre for Pathway Analysis provides a unique interactive and multifaceted environment for therapeutic innovation where academics, pharma and biotech work side-by-side. In the Centre, we are developing our own research programme and target discovery pipeline (p6-8). The methods and approaches we are developing are disease-agnostic but we are currently focused on applying these in oncology, infectious disease, inflammatory bowel disease and CNS diseases.



Dr Namshik Han Head of Computational Research & Al

DISEASE SIGNATURE IDENTIFICATION THROUGH AI

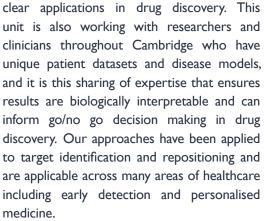
The aim of our computational research and artificial intelligence team, led by Dr Namshik Han, is to create an atlas of disease mechanisms through the integration and interrogation of large multi-omic datasets. The team are using bespoke machine learning methods to identify new signatures of disease and thera-

peutic targets, as well as network analysis to gain a deep understanding of the underlying causes of disease. Working closely in collaboration with the medical





 $research\ charity\ LifeArc, JW\ Pharmaceutical\ and\ Storm\ The rapeutics,$ $the\ team\ has\ been\ able\ to\ develop\ and\ validate\ methodology\ with$















DISEASE SIGNATURE INTERROGATION

The opening of the research institute in 2019 provided the opportunity to establish our own in house experimental capabilities, and our target discovery and functional validation programme led by Dr Rebecca Harris was initiated in 2020. By drawing

on the academic research base within Cambridge we aim to develop clinically relevant, well validated targets for disease therapy, and will engage with clinical and pharma experts throughout. In addition to delivering novel, well validated targets, we will also focus on the scale-up of complex cellular or patient-derived disease models for industry drug discovery workflows and generation of novel reagents that will streamline and advance industry screening processes. The specialist facilities available within the institute, set up and managed by our facilities team (p27), led by Gian-Marco Melfi, provides additional opportunities for pre-competitive collaborative projects between Cambridge academics and our Consortium partners.

Dr Rebecca Harris Head of Target Discovery







Key publications

- Han N et al. Identification of SARS-CoV-2 induced pathways reveal drug repurposing strategies. Science Advances doi: 10.1126/sciadv.abh3032 (2021).
- Cho J et al. Inflammatory signals induce AT2 cell-derived Damage-Associated Transient Progenitors that mediate alveolar regeneration. Cell Stem Cell (2020).

Computational team Top: left to right Dr Gehad Youssef, Dr Sanjay Rathee Dr Woochang Hwang, Dr Georgia Tsagkogeorga, Dr Meabh MacMahon, Nicholas M. Katritsis, Anika Liu,

Winnie Lei



CENTRE FOR PATHWAY ANALYSIS CASE STUDIES

TARGETING RNA-MODIFYING ENZYMES AS PROMISING ANTI-CANCER STRATEGY

Work at the Milner Therapeutics Institute by Director Tony Kouzarides and Konstantinos Tzelepis in collaboration with Storm Therapeutics has made a promising step towards developing a new drug for treating acute myeloid leukaemia. Kouzarides and colleagues reported a new approach to cancer treatment that targets an RNA modifying enzyme METTL3 — known to have a key role in translating mRNA into proteins. This is the first time an RNA-modification pathway has been targeted as a strategy to fight cancer, and the STORM METTL3 inhibitor will enter clinical trials in 2022.

Yankova, E, et al. Nature DOI: 10.1038/s41586-021-03536-w (2021).



"This is a brand-new field of research for cancer and the first drug of its type to be developed."

Tony Kouzarides



APPLYING MACHINE LEARNING FOR DRUG REPURPOSING IN COVID-19

With the support of LifeArc, the computational research and AI team led by Namshik Han have applied their bespoke AI methods and network analysis to uncover hidden pathways and reposition 200 already approved drugs against COVID-19. 20% of these drugs are currently in COVID-19 clinical trials, and the group went on to successfully validate two drugs in cellular assays (Proguanil and Sulfasalazine). These SARS-CoV-2 induced pathways define a resource for repurposing of drugs against COVID-19, either as monotherapies or in combination therapy.

Han N et al. Science Advances doi: 10.1126/sciadv.abh3032 (2021).



"It is essential that we apply the power of massive and complex data to better understand fundamental biology and disease pathways. Doing this through the integration of different scientific disciplines represents just one of the ways we can collaboratively create real impact for patients."

Dr David Pardoe, Head of Technology Development at LifeArc



ACADEMICS IN RESIDENCE

Junior academic research groups whose research interests are aligned with ours are housed in the Centre for Pathway Analysis.

MANAV PATHANIA



The Pathania group (Dept of Oncology and CRUK Cambridge Centre) have a central focus on developing new mouse models for children's brain tumours, to better understand the interplay between genetic and phenotypic heterogeneity in different brain tumour types. By applying single cell sequencing to identify tumour microenvironmental dependencies and CRISPR screening to test genetic and epigenetic weaknesses in these immune-competent tumour models, they hope in the longer term to pave the way to more targeted, precise treatments that can be tailored to the combination of mutations unique to each tumour. Key areas of interest include identifying and functionally validating the precise type of

neural stem or progenitor cells that lie at the root of different brain cancer types, and using mouse models to investigate how brain tumours respond and develop resistance to first-line therapies.

Key publications ■ Pathania M et al. 32(5):684-700.e9 Cancer Cell (2017).

KONSTANTINOS TZELEPIS



The *Tzelepis group* (Milner Therapeutics Insitute and Wellcome Sanger Institute) is focusing on the discovery of novel therapeutic targets and the bench-to-clinic transition of new treatments for aggressive malignancies including acute myeloid leukaemia (AML). Their recent work has led to the development of sophisticated CRISPR screening platforms which formed the basis for follow-up studies that identified the role of several new cancer vulnerabilities including the RNA methyltransferase METTL3 and the splicing kinase SRPK1. Now, his group is investigating how the structures and modifications of RNA regulate disease initiation and progression.

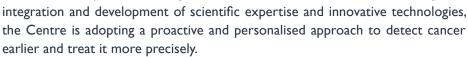
Key publications Yankova, Blackaby et al. Nature doi: 10.1038/s41586-021-03536-w (2021).

■ Mikutis et al. ACS Central Science doi: 10.1021/acscentsci.0c01094 (2020).

ONCO-INNOVATION AT THE CANCER RESEARCH UK CAMBRIDGE CENTRE

The Cancer Research UK Cambridge Centre (CRUK CC) unites more than 700 researchers and healthcare professionals across the academic and industrial sectors within the Cambridge area. The Centre's common mission is to end death and disease caused by cancer, through research, treatment and education. Through the

Dr Rebecca Harris Programme Manager





Professor Tony Kouzarides
Programme Lead

The Milner Therapeutics Institute works closely with the CRUK CC through the delivery of the Onco-Innovation programme. The Onco-Innovation programme sits right at the interface between academia and industry, working to apply multidisciplinary science in order to progress pre-clinical cancer research and to build a more cohesive flow between pre-clinical research and clinical impact. We focus on three key areas: research, industry engagement and entrepreneurship. We create powerful research partnerships both within the Institute (p21) and throughout the wider Cambridge Centre, enabling exchange of expertise and resources between industry, clinicians and academia. So far 10 industry—academic collaborative projects across 6 CRUK CC programmes have been established (p22), resulting in investment of >£1.5million in CRUK CC laboratories. We also work to provide support and opportunities for oncology-focused entrepreneurs and start-ups through our close relationship with Start Codon (p16) and through the provision of incubator space within the MTI (p18).





JOINT ASTRAZENECA-CANCER RESEARCH UK FUNCTIONAL GENOMICS CENTRE

The Functional Genomics Centre (FGC) was established in 2019 as a collaboration between AstraZeneca and Cancer Research UK to build a centre focused on developing and applying genetic screening in the field of oncology. Based at the Milner Therapeutics Institute, the FGC is developing novel CRISPR technologies to better understand the biology of cancer, creating biological models that may be more reflective of human disease and advancing computational approaches to better analysis of big datasets. A goal of the FGC is to use these technologies to deliver projects to AstraZeneca and Cancer Research UK scientists that will:

- Increase our understanding of the basic biology of cancer
- Identify novel target opportunities for therapeutics
- Improve understanding of drug resistance in order to support patient stratification or better treatment combination options.





AstraZeneca and CRUK have independent use of the FGC facilities but are jointly developing state-of-theart functional genomic technologies. Our scientists work alongside each other and on projects across the different organisations, facilitating a truly collaborative environment focused on technical innovation and scientific progress. Our technology development is focused on creating small and better libraries, which will allow us to probe models of increasing complexity, such as human primary immune cells and patient derived organoids. Another focus is the implementation of assays to study more complex phenotypes, such as the modulation of gene expression signatures and protein abundancies enabled by single cell RNA sequencing and FACS sorting. All development is co-owned and so is free to flow back into either organisation, democratising access to this powerful technology. The Milner Therapeutics Institute provides a unique collaborative space and environment on the Cambridge Biomedical Campus which is convenient for both AstraZeneca and CRUK.

CASE STUDY

PROFESSOR TYSON V. SHARP CANCER RESEARCH UK BARTS CENTRE

"The focus of our lab is understanding the function of the tumour suppressor protein LIMD I, which is lost in more than 40% of lung cancers diagnosed in the UK. We were keen to make a step change using omics approaches to understand new susceptibilities associated with LIMD1 negative cancers. Working with FGC has provided access to CRISPR screening capabilities that we would not have been able to replicate independently with regard to assay design, diligence and speed. The FGC team understood the biological questions that I was looking to answer, which has made the collaboration effective and straightforward. The insight that these screens have provided is incredible. Not only did the screen identify hits and pathways associated with known biology that validated results that my group has previously generated, the screens also revealed new exciting biology that is targetable therapeutically. It's very exciting that we have identified a possible new targeted treatment approach for patients with LIMD I deficient cancer. "





CONNECT: HEALTH TECH

Connect: Health Tech is a new University Enterprise Zone (UEZ). Initially funded by Research England, it has been created to build a highly effective inter-disciplinary bridge between two Cambridge research hubs and beyond — the South biomedical hub anchored at the Milner Therapeutics Institute and the West science and technology hub at the Maxwell Centre.

Dr Paula Rogers-Brown Connect: Health Tech Business Community Manager



The bridge will bring together and integrate a community from across the University, research institutes, NHS, industry, investors, local and national Government, creating opportunities to accelerate the design, development and testing of diagnostics and therapies.

Despite current global challenges, Connect: Health Tech UEZ has made a significant impact in its first year including: attracting over £2.4 million in research funding; delivery of events for over 700 attendees; creation of operational research and incubation spaces for Start Codon (p16) and Frame Shift (p18); and the launch of a new tailored digital community platform for the Cambridge Cluster and beyond.



Dr Alex Samoshkin Translational Technology Manager Office for Translational Research and Maxwell Centre

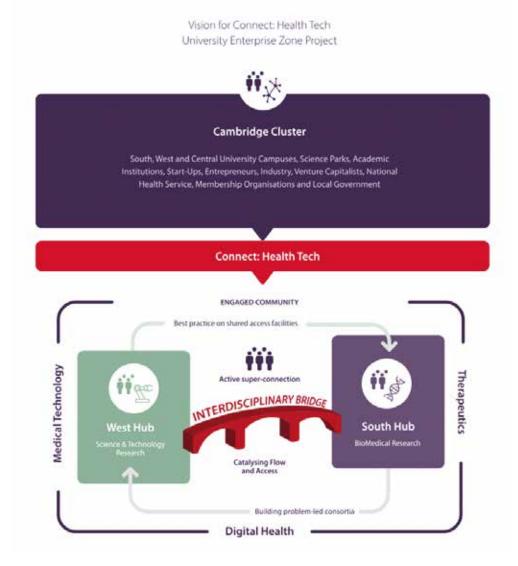
Connect: Health Tech has also published a roadmap report detailing the interventions developed over the past 12 months, with potential to be adopted by other hubs to catalyse connections and collaborations across disciplines. The digital report *Creating a University Enterprise Zone for Cambridge* across the life and physical sciences is available to view or download from the Connect: Health Tech microsite.

We welcome new members to our growing interdisciplinary online community.

Join us at: www.connect.cam.ac.uk/health-tech

Milner alliance members are invited to join and use this community to connect with each other and more widely in Cambridge.

The diagram below outlines how Connect: Health Tech will create positive interventions around the health—tech axis to unlock the potential of the cluster in identified areas and stimulate a world-class ecosystem that connects research and development for greater outcomes that benefit society.



START CODON ACCELERATOR

The life science and healthcare venture builder and accelerator Start Codon (the vision of which was conceived and created together with the Milner Therapeutics Institute) is the first in Cambridge to provide start-up companies with a combination of seed funding, facilities, mentoring and access to a dedicated team and network of industry-leading contacts. This year, Start Codon, represented by Dr Jason Mellad (CEO and co-founder), Daniel Rooke (COO and co-founder), Dr Michael Salako (Investment Director) and Silvia Baudone (Programme

lason Mellad, CEO & Daniel Rooke, COO

and Partnerships Manager), saw its first four cohort companies graduate, and also welcomed its second cohort. Each of the cohort companies is based at the Milner Therapeutics Institute for 6 months before moving on to the next stage of their development.

In conjunction with the accelerator programme, Start Codon has once again joined forces with Cancer Research UK to offer its Entrepreneurial Programmes Initiative, which aims to educate the next generation of entrepreneurs on how to develop exciting new start-ups that will address unmet medical needs by promoting the development of new business ventures within academia and encourage entrepreneurship. Start Codon's role focuses on the Cambridge cluster, where they educate a multi-disciplinary oncology research community about entrepreneurship, company formation, operations, and fundraising, with the goal of translating their medical research. Early-stage start-up companies in the life sciences and healthcare space are invited to apply via the website.

First cohort of companies from the Start Codon accelerator:



Spirea, a spin-out from the University of Cambridge, is developing the next generation of antibody drug conjugate cancer therapeutics to carry more drug payload to tumour cells, resulting in greater efficacy, tolerability and the ability to treat more cancer patients. The Spirea platform has been validated *in vitro* and *in vivo* xenograft studies and the company will now progress to building its own ADC pipeline. In 2020, Spirea secured funding from high-profile investors Start Codon, Dr Jonathan Milner (Meltwind), o2h Ventures and Syndicate Room following earlier investments by IP Group and Cambridge Enterprise Seed Funds.

Enhanc3D Genomics

Enhanc3D Genomics is a functional genomics spinout company from the Babraham Institute (Cambridge, UK) leveraging a disruptive technology to profile three-dimensional (3D) genome folding at high resolution. Understanding DNA organisation and long-distance interactions allows gene enhancers and non-coding genetic variants to be linked to their target genes and holds promise to unlock disease related genetics for therapeutic discovery.



Drishti Discoveries, a start-up leveraging a proprietary gene silencing technology to develop therapies for rare diseases is currently in the proof of concept stage and in a seed funding round.



Semarion, a University of Cambridge spin-out, is revolutionising adherent cell assays for drug discovery through novel materials physics. Its proprietary SemaCyte® microcarrier platform brings adherent cells into suspension enabling freezing adherent assay-ready cells, miniaturizing primary cell assays, and multiplexing cell line panels to drastically increase workflow efficiencies.

FRAME SHIFT BIO-INCUBATOR

The Milner Therapeutics Institute is expanding its space for start-ups and SMEs with the launch of the new Frame Shift Bio-incubator this year. This provides a unique environment for companies to work side-by-side with start-ups, pharma and academic scientists in an eco-system physically and culturally designed to spark collaboration and entrepreneurship.

Frame Shift has a particular focus on R&D intensive companies working in areas related to the institute's expertise (e.g. functional genomics, early target discovery, therapeutics) and will complement the Start Codon Accelerator, seeking companies who are at a later stage than those in the Start Codon programme.

Frame Shift began with the successful model of companies such as Rockend Ltd who have been located in the institute during the past year and expanded significantly as to require expansion to another site. Companies in the incubator will have access to space in the MTI environment for I2 months to conduct critical R&D work and successfully grow so that they are ready to scale-up at one of the science parks in Cambridge.



Benefits for companies in the Frame Shift Bio-incubator include:

- Potential for interactions with clinicians, researchers and drug discovery scientists at the University and hospitals on the biomedical campus.
- Advice and research input from the Centre of Pathway Analysis (ρ6).
- Know-how and expertise of representatives of the ten Milner affiliated pharma companies that are part of our consortium (p21).
- Membership of an exclusive network of 70+ affiliated global pharma and biotech companies (p20), and access to Milner internal and external events including the annual Milner Therapeutics Symposium.



GLOBAL THERAPEUTIC ALLIANCE

The Global Therapeutic Alliance, led by Dr Alison Schuldt, aims to build a global research community working together across academia and industry, with Cambridge providing a hub of expertise. The Milner Therapeutics Consortium is central to this aim (p21), and the Affiliated Company and Affiliated Research Institutions scheme brings complementary expertise and resources to the community, and provide opportunity to extend collaborative links within and beyond Cambridge.



Dr Alison Schuldt Head of Partnerships and Alliance

The Milner annual symposium is a key event for bringing our network together and building new collaborations. With more than 900 attendees online from both academia and industry, this forum is rapidly growing — highlighting the excellent progress being made at this cross-sector interface and the strong appetite from the community to work together towards the common goal of transforming pioneering science into therapies. The symposium is complemented by the monthly Milner seminar series, smaller workshops and partnering

events on industry prioritised research topics. These have led to new collaborative projects, successful academic-industry funding applications for shared equipment and investment of industry into biotech.





81 ORGANIZATIONS ACROSS FOUR CONTINENTS



Top: Nikki Mann, Digital Communications Manager Mary-Jane Roebuck, Events and Communications Coordinator Dr Nicola McCarthy, Consortium Manager



MILNER THERAPEUTICS CONSORTIUM

The Consortium has been active since June 2015 and is based on a research agreement signed by three academic centres in Cambridge and ten pharmaceutical companies: the University of Cambridge, the Wellcome Sanger Institute and the Babraham Institute; and Astex, AstraZeneca, Bristol Myers Squibb, Eisai, Eli Lilly and Company, Ferring, GlaxoSmithKline, Janssen R&D, Pfizer and Shionogi. The agreement is designed to facilitate the speedy exchange of reagents and information for research collaboration with academics across Cambridge. Each industry partner within the Milner Therapeutics Consortium has set aside funds for collaborative projects, which are open to any therapeutic area and are expected to lead to joint publications.





























The Innovation Board brings together the industrial and academic partners of the Consortium to determine the overarching challenges facing the pharmaceutical industry and predict future needs. It enables companies to collaborate on common research projects related to targets, technologies and therapeutic areas.

There have been **25** Consortium projects across eleven Departments and Institutes of the University and the Babraham to date; these include a focus on oncology, infectious diseases, CNS and chemistry (an investment of **£6** million by our industry partners) (*p*22). The projects are broad in remit and can include access to compounds, datasets, equipment or know-how in a particular technique. In some cases, an industry scientist has come to work in the academic's lab, and in others an academic post has been funded specifically for the project. The emphasis in all our collaborations is on mutual sharing of expertise. In 2021, we initiated our first pre-competitive project with multiple pharmaceutical companies collaborating with three academic groups from the University and Babraham Insitute (*p*23).

CONSORTIUM PROJECTS

Lucy Colwell (Dept Chemistry)

The use of artificial intelligence technologies in fragment-based drug discovery (Astex)

Martin Welch (Dept Biochemistry)

Advancing disease understanding and drug discovery in infectious diseases (Shionogi)

Anthony Davenport (Dept Medicine)

A drug re-purposing strategy for treatment of angina* (AstraZeneca)

Trevor Robbins (Dept Psychology)

Rodent models for remediating attention, working memory and impulsivity (Shionogi)

Angela Roberts (Dept PDN)

Understanding mechanisms of anhedonia and its treatment* (Shionogi)

Gillian Griffiths (Cambridge Institute for Medical Research) Strategies to influence T-cell mediated tumour killing* (AstraZeneca)

Emma Rawlins & Joo Hyeon Lee (Wellcome CRUK Gurdon Institute & Wellcome MRC Cambridge Stem Cell Institute)

Elucidating signalling pathways that drive lung development

Ludovic Vallier (Wellcome MRC Cambridge Stem Cell Institute) Novel therapeutics for liver disease (Ferring & GlaxoSmithKline)

in improved organoid models* (AstraZeneca)

David Belin (Dept Psychology)

Towards the identification of novel biobehavioural markers related to addiction (Shionogi)

Marghertia Turco (Dept Pathology)

An organoid library of the human endometrium (Ferring)

John Skidmore, Alex Whitworth and Nicholas

Ktistakis (ALBORADA Drug Discovery Institute, MRC Mitochondrial Biology Unit and Babraham Insitute)

Autophagy targets in neurodegeneration (Astex, Eisai, and Eli Lilley and Company)

Projects with Cancer Research UK Cambridge Centre

Gerard Evan (Dept Biochemistry)

Uncovering how Myc-mediated gene expression supports the tumour environment* (AstraZeneca)

Frank McCaughan (Depts Biochemistry & Medicine)

Identifying potential therapies for early squamous lung cancer (Janssen R&D)

Gerard Evan & Cathy Wilson (Dept Biochemistry)

Strategies to prevent the progression to pancreatic adenocarcinoma* (AstraZeneca)

Carlos Caldas (CRUK Cambridge Institute)

Investigating how different sub-types of breast cancer respond to different treatments* (AstraZeneca)

Simon Cook (Babraham Institute)

Investigating modulators of the ERK/MAPK pathway* (Astex)

Tony Kouzarides (Wellcome CRUK Gurdon & Milner Institutes) Insights into the use of PROTAC molecules as a therapeutic strategy (GlaxoSmithKline)

Frank McCaughan (Depts Biochemistry & Medicine)

Identifying targets to prevent squamous carcinogenesis progression* (AstraZeneca)

Suzanne Turner (Dept Pathology)

Mechanisms of resistance to ALK inhibition in neuro-blastoma* (AstraZeneca)

Bertie Göttgens (Wellcome MRC Cambridge Stem Cell Institute)
Capturing the early stages of acute myeloid leukaemia to evaluate new therapeutics* (AstraZeneca)

Charlie Massie, Simon Pacey & Vincent

Gnanapragasam (Early Detection Programme, CRUK Cambridge Centre, Dept Oncology; Depts Oncology and Surgery)

Developing a pathway for precision medicine in early stage prostate cancer, to reduce radical treatment in active surveillance populations and improve outcomes for patients with aggressive disease (AstraZeneca)

CONSORTIUM CASE STUDY

This year, we announced the first Milner Consortium project that brings together multiple academic groups across the University and Babraham Institute to work with three of our pharma partner companies — Astex, Eisai and Eli Lilly and Company.

The goal of this project is to investigate autophagy targets in neurodegeneration. Autophagy is a major protein and organelle recycling and degradation pathway and is increasingly being targeted as a therapeutic strategy in neurodegeneration. But the development of clinically viable modulators of autophagy requires better understanding of target relevance across mechanistic and disease models. This project aims to tackle this, drawing on the combined experience of an academic–industry team to assess a number of targets in complementary compound and genetic screening assays and neuronal disease models, to uncover robust targets for prioritization.

Arising from an industry-led workshop that brought together key academic and industry opinion leaders within the Milner Therapeutics Consortium, this project includes academic teams from three institutes across Cambridge – John Skidmore's team at the ALBORADA Drug Discovery Institute, Nicholas Ktistakis's group at the Babraham Institute and Alex Whitworth's group at the MRC Mitochondrial Biology Unit – each of whom have complementary expertise in autophagy mechanisms and models. They will work in close consultation with industry scientists at the three companies, who each bring unique know-how from internal research programmes in neurodegeneration.

"Effective collaboration between labs in academia and industry is critical for the successful translation of basic science and this project brings

together experts with deep understanding of autophagy, neurodegeneration and drug discovery to address an important question ... It's been exciting to work with this team, and to see the progress we can make through our combined insights. This project will help us to pinpoint those targets that have broad and robust effects and thus greater therapeutic promise. If Dr John Skidmore, Chief Scientific Officer at the ALBORADA Drug Discovery Institute funded by Alzheimer's Research UK

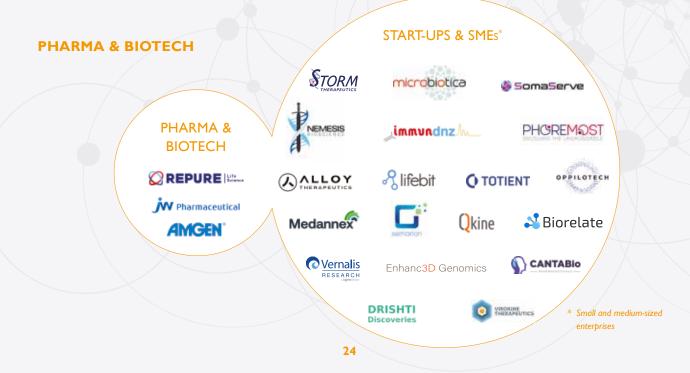


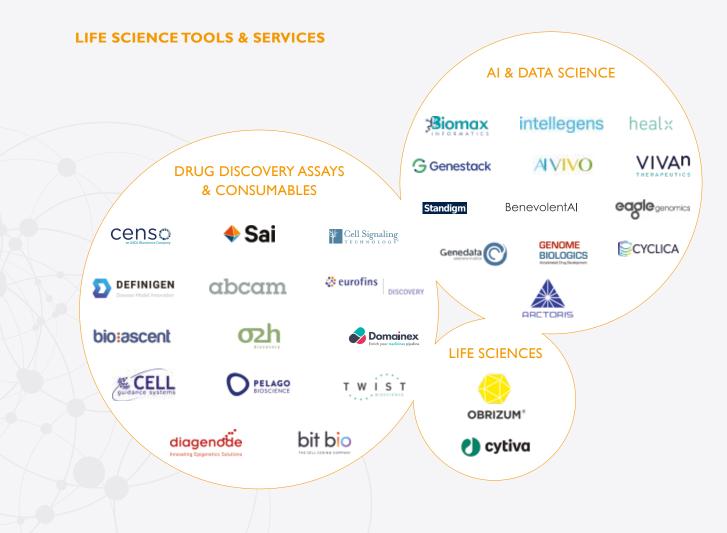
AFFILIATED COMPANIES

The Affiliated Company scheme, established in October 2016, now includes 51 organizations which bring diverse expertise and resource to the Milner network.

The institute promotes interactions between affiliated companies and academic, pharmaceutical or biotechnology partners, with the aim of building a cohesive community with an aligned vision. Our annual symposium is a key event — supported by the affiliated companies — for catalysing new opportunities for collaboration.

The affiliated companies include global pharma and biotech companies as well as a significant number of start-ups and SMEs with their own drug pipeline, many of which have arisen from research in Cambridge. Our activities are supported by a broad range of life science companies providing essential drug discovery expertise. The affiliate companies span disease areas from cancer and neurodegeneration to rare disease and there is a strong cohort of companies focusing on AI and data science, emphasizing the rapidly increasing application of this technology in biomedical research.





AFFILIATED RESEARCH INSTITUTIONS

The Affiliated Research Institutions programme, established in October 2017, now includes 14 academic institutions across four continents. These partners share our vision of developing new models for research collaboration across industry and academia to transform pioneering science into therapies. They have free access to our annual symposium and themed events; we also provide them with contacts throughout the Global Therapeutic Alliance, by fostering research opportunities and supporting engagement with industry in their own institutions.





VENTURE PARTNERS

The Affiliated Venture Partners programme, operational since October 2017, provides mentoring and potential funding for the start-ups within the Start Codon Accelerator and the Frame Shift Bio-incubator.

OUR FUNDERS









FACILITIES AND OPERATIONS TEAM











Top left: Dr Louisa Bellis, Business Operations Manager Saffron Murfitt, Administrative and Personal Assistant Chloe Caley, Finance, HR, and Administration Coordinator Ben Pearson, Research Laboratory Technician Gian-Marco Melfi, Scientific Facilities Coordinator

OUR ORGANIZATIONAL STRUCTURE

INNOVATION BOARD

- Dr Susan Galbraith, AstraZeneca
- Dr David Andrews, AstraZeneca
- Dr John Lyons, Astex
- Dr Rab Prinjha, GlaxoSmithKline
- Victoria Higgins, GlaxoSmithKline
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- Dr Ryuichi Kiyama, Shionogi
- Dr Yoshiro Shiba, Shionogi
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- Dr Mathew Garnett,
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- Dr Lilian Alcaraz, Janssen R&D
- Dr Ann Connolly, Janssen R&D
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- Dr Andy Takle, Eisai
- Professor Greg Hannon, CRUK Cambridge Institute
- Dr Kathryn Chapman, Milner Therapeutics Institute
- Professor Tony Kouzarides,
 Milner Therapeutics Institute

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- Professor Stephen O'Rahilly
- Dr Emma Rawlins
- Professor David Rubinsztein
- Professor Ken Smith

UNIVERSITY INNOVATION REPRESENTATIVES (2020–2021)

- Dr Stephen Smith
- Dr James Richards
- Dr Hiran Prag
- Dr Kirsty Hooper
- Dr Qianxin Wu
- Dr Eugene Park
- Dr Chun Gong
- Dr Jenny Hirst
- Dr Paulo Rodrigues
- Dr Chiara Guiliano

HOW TO ENGAGE WITH US

Please write to us (contact@milner.cam.ac.uk) if you would like to engage with the Institute for a new partnership, research project, Consortium or Affiliated membership. We can provide for:

ACADEMICS

- Opportunities to partner with industry for early stage research collaborations
- Pre-agreed T&Cs to accelerate contracts
- Access for selected projects to advanced platforms in Centre for Pathway Analysis
- Links to AZ/CRUK Functional Genomics Centre

INDUSTRY

Consortium membership

- A gateway to academics and other industry members for research collaboration
- Pre-agreed T&Cs to accelerate contracts
- Board seat for strategic input into drug discovery pipeline and first sight of projects
- Priority access to Centre for Pathway Analysis
- Dedicated company profile at annual symposium and throughout Cambridge

ENTREPRENEURS

- Research space in the Frame Shift Bio-incubator
- Significant investment, research space and mentorship through Start Codon accelerator



Affiliated partnership

- Opportunities to partner with academics and pharma companies
- Visible profile as Alliance partners and as sponsors of annual symposium
- Access to and presentation opportunities at biotech-focused events (e.g. bespoke workshops and Milner seminar series)

INVESTORS

Affiliated partnership

- First sight of Cambridge start-ups at pitch events
- Access to research community, companies and startups at annual symposium, seminars and workshops
- Potential deal flow for companies inside and outside Milner

Bringing discoveries to life

