





OUR MISSION:
TO TRANSFORM PIONEERING
SCIENCE INTO THERAPIES
BY CATALYSING PARTNERSHIPS
BETWEEN ACADEMIA
AND INDUSTRY

The vision for the Milner Therapeutics Institute, when it was established four years ago, was to build close collaborative interactions between academia and industry to help transform ground breaking science into therapies. The establishment of the **Milner Therapeutics Consortium** (consisting of the University of Cambridge, Sanger Institute, Babraham Institute and 7 pharma companies (p14) was central to this vision. This has resulted in 19 collaborative projects within 10 University Departments in the areas of oncology, infectious disease, CNS and chemistry. During this period, we have also established a **Global Therapeutic Alliance** (p13) of 80 affiliated companies and institutes, creating a network of academic and industry scientists who share our vision. Our annual symposium has become a key event for bringing this community together.

This year will mark an exciting step change with the opening of the new purpose-built headquarters of the Milner Therapeutics Institute on the biomedical campus (p5). Through this research institute — made possible through the support of Dr Jonathan Milner and the University of Cambridge — we will create a cross sector, interdisciplinary community, where academics and industry scientists can work side by side at the bench. The new research institute will allow us to establish our own in-house research programme for target discovery within the **Centre for Pathway Analysis** (p6) and support entrepreneurs through the **Start Codon accelerator** (p8). We will also house other units with a therapeutic outlook such as the **AstraZeneca–Cancer Research UK Functional Genomics Centre** (p10). The expansion of the Milner team in the past year will allow us to support this new ‘in house’ community as well as the expanding Global Therapeutic Alliance.



*Dr Kathryn Chapman
Deputy Director*



*Professor Tony Kouzarides
Director*

A GLOBAL THERAPEUTIC ALLIANCE

- 
- 54 AFFILIATED COMPANIES
 - 14 AFFILIATED INSTITUTIONS ACROSS FOUR CONTINENTS
 - 7 PHARMA COMPANIES
 - 3 ACADEMIC INSTITUTES
 - 2 VENTURE PARTNERS



NETWORKING EVENTS

- 400+ ATTENDEES: ANNUAL THERAPEUTICS SYMPOSIUM
- 150 ATTENDEES: DINNER FOR AFFILIATED ORGANIZATIONS
- 24 BESPOKE WORKSHOPS AND PARTNERING EVENTS

CONNECT
ACADEMIA
+ INDUSTRY

CENTRE FOR
PATHWAY
ANALYSIS

**MILNER
INSTITUTE**

ASTRAZENECA
CRUK
FUNCTIONAL
GENOMICS
CENTRE

CAMBRIDGE
CENTRE FOR
PROTEOMICS

DRIVE
COLLABORATIVE
PROJECTS



WHAT WE DO

ACADEMIC-PHARMA CONSORTIUM

3 CAMBRIDGE ACADEMIC INSTITUTIONS
7 PHARMA COMPANIES
19 PROJECTS IN 10 DEPARTMENTS
£3.2 MILLION INVESTMENT IN CAMBRIDGE RESEARCH



ENABLE RESEARCH IN CAMBRIDGE



11 INNOVATION REPS
17 SCIENTIFIC ADVISORS

ACCELERATE THERAPEUTIC COMPANIES



START CODON

INVESTMENT, MENTORSHIP
AND SPACE FOR INNOVATIVE START-UPS

Jeffrey Cheah
Biomedical Centre



MILNER THERAPEUTICS INSTITUTE

The Milner Therapeutics Institute encompasses both a research institute and a global outreach programme for collaboration.

RESEARCH INSTITUTE

The research institute will move from the Gurdon Institute and open mid-2019 in the new **Jeffrey Cheah Biomedical Centre** on the Cambridge Biomedical Campus, providing a physical hub for collaboration between industry and academia. Scientists from academia, pharma and biotech will work together in this common space, creating a unique research environment that breaks down barriers between these sectors.

The institute will initially house four research units:

- Centre for Pathway Analysis (p6)
- Start Codon accelerator programme (p8)
- Cambridge Centre for Proteomics (p9)
- AstraZeneca–Cancer Research UK Functional Genomics Centre (p10)

GLOBAL OUTREACH PROGRAMME

The Milner Therapeutics Institute has built a global research community working together across academia and industry, with Cambridge providing a hub of expertise. The outreach programme is delivered through our:

- Milner Therapeutics Consortium (p14)
- Global Therapeutic Alliance (p13)
- Onco-innovation programme at the Cancer Research UK Cambridge Centre (p11)

Our neighbours in the building will include the Wellcome Trust–MRC Cambridge Stem Cell Institute (led by Professor Tony Green) and the new Cambridge Institute of Therapeutic Immunology and Infectious Disease (led by Professor Ken Smith), which will enable new collaborations in areas of therapeutic priority.

CENTRE FOR PATHWAY ANALYSIS

The Centre for Pathway Analysis will have labs and open plan desk space where academics, pharma and biotech work side-by-side, providing a unique interactive and multifaceted environment for therapeutic innovation. The Centre will allow the development of our own research programme and drug discovery pipeline, with a particular focus on oncology.

DISEASE SIGNATURE IDENTIFICATION

Our computational biology team, led by Dr Namshik Han, is investigating signatures of disease by integrating and analysing large multi-omic datasets. The team are working closely in collaboration with the medical research charity LifeArc and also with Storm Therapeutics to devise new harmonized databases and machine learning methods for target identification. We will collaborate with researchers throughout Cambridge with appropriate assays to validate the targets identified.

DISEASE SIGNATURE INTERROGATION

Led by Dr Rebecca Harris, the team will initiate a target discovery programme next year, which will functionally interrogate signatures of disease identified through computational biology. We will work with selected researchers on the campus with complex cellular or organoid disease models to develop robust assays for medium-throughput genetic or chemical screening for target identification and validation; this platform will leverage unique resources from our industry partners including compound libraries and expertise in screen design and interpretation. These specialist facilities, set up and managed by our facilities manager Gian-marco Melfi, will also provide new opportunities for pre-competitive collaborative projects between academics and our Consortium partners.

COMPANIES AND ACADEMICS IN RESIDENCE

Selected start-up companies, and junior academic research groups whose research interests are aligned with ours, will be housed in the Centre for Pathway Analysis. Our Milner Therapeutics Consortium pharma partners will also have a physical presence, through scientists working on collaborative projects with Cambridge researchers and through hot-desking.



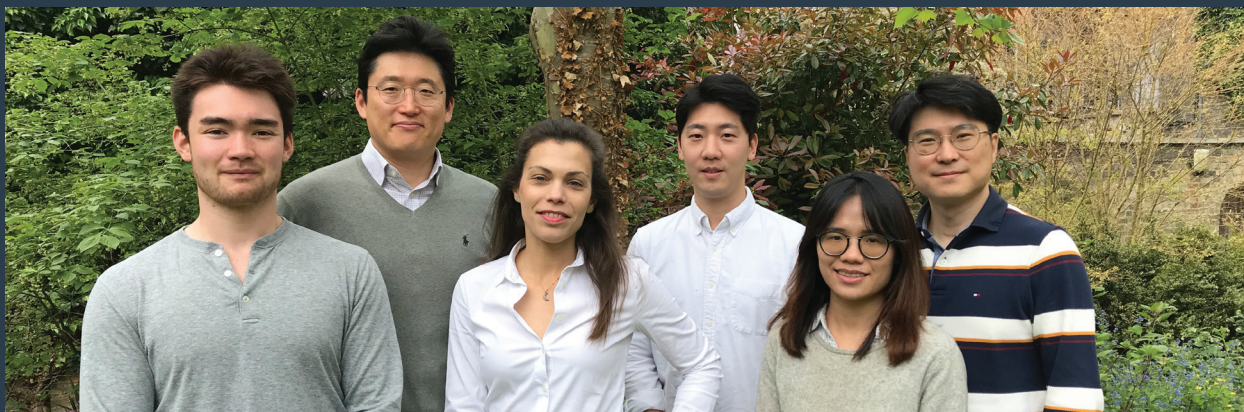
Dr Rebecca Harris
Drug Discovery Programme Manager



Gian-marco Melfi
Scientific Facilities Coordinator



Dr Alison Schuldt
Global Alliance Manager



Computational Biology Programme Team



Nikki Mann
Communications & Events Coordinator



Dr Namshik Han
Computational Biology Programme Lead

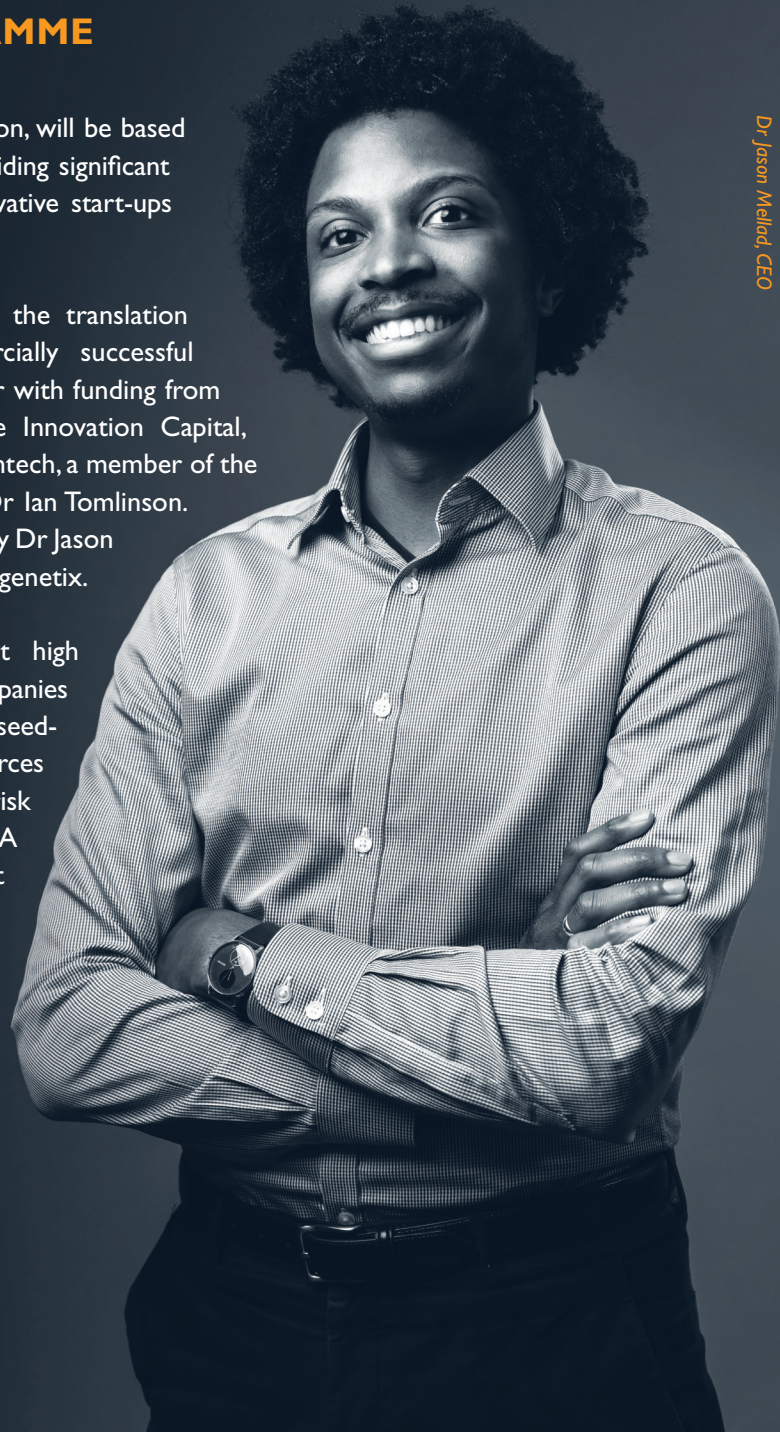
ACCELERATOR PROGRAMME

A new life science accelerator, Start Codon, will be based in the Milner Therapeutics Institute, providing significant funding and support for up to ten innovative start-ups each year.

This initiative will be aimed at driving the translation of world-class research into commercially successful companies. It has been launched this year with funding from keystone investors including Cambridge Innovation Capital, Babraham Bioscience Technologies, Genentech, a member of the Roche Group, Dr Jonathan Milner and Dr Ian Tomlinson. Start Codon's executive team will be led by Dr Jason Mellad, previously CEO of Cambridge Epigenetix.

Start Codon will identify and recruit high potential life science and healthcare companies from across the UK and beyond, provide seed-funding, and leverage the world-class resources of the Cambridge Cluster to reduce risk and prepare them for a successful Series A fundraise. The accelerator will be the first within the Cambridge Cluster to provide life science start-ups with significant investment (up to £250K), a full-time dedicated team of experienced and active mentors, and office and lab space located at the Milner Therapeutics Institute. Start Codon plans to raise a venture fund with the goal of investing in and supporting up to 50 start-up companies over the next 5 years.

Dr Jason Mellad, CEO



CAMBRIDGE CENTRE FOR PROTEOMICS

The Cambridge Centre for Proteomics (CCP) is an internationally renowned proteomics facility which strives for the development and application of robust proteomics technology. It is comprised of a core facility that can be accessed through collaboration or fee-for-service managed by Dr Mike Deery, and a research group directed by Professor Kathryn Lilley. CCP is a member of the Department of Biochemistry and located within the Milner Therapeutics Institute.

CCP houses state-of-the-art mass spectrometers and the core facility provides services ranging from sample preparation to quantitative proteomics workflows and data analysis.

CCP's research centres around themes which couple genomics and proteomics approaches with data analysis using machine learning approaches. Its research aims to understand how localised translation, differential post transcriptional and translational processing, interacting partners and protein structure affect the subcellular location of proteins and their ability to carry out multiple functions.

To enable us to reach these aims, we have developed a set of technologies and workflows, both experimental and computational. These technologies include: LOPIT (the location of organelle proteomics using isotope tagging), which allows the simultaneous mapping of proteins to their subcellular location on a cell-wide scale; and OOPS (orthogonal organic phase extraction), which efficiently samples the RNA binding proteome.

CCP research is funded by the BBSRC and the Wellcome Trust and has multiple collaborations with industrial partners. It is also part of EPIC-XS, a recently funded European Proteomics Infrastructure Consortium including top proteomics laboratories in Europe.



Professor Kathryn Lilley
Director



JOINT ASTRAZENECA–CANCER RESEARCH UK FUNCTIONAL GENOMICS CENTRE

The joint AstraZeneca–Cancer Research UK (CRUK) Functional Genomics Centre will deliver state-of-the-art functional genetic screens, cancer modelling and big data processing — all aimed at accelerating the discovery of new cancer medicines.

Based at the Milner Therapeutics Institute, the Functional Genomics Centre will develop 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 analyse big datasets. A goal of the new centre will be the identification of novel drug targets to better treat cancer patients and overcome drug resistance. AstraZeneca and CRUK will have independent use of the Centre's facilities but will jointly develop the underpinning state-of-the-art functional genomics technologies. CRUK and AstraZeneca scientists will work alongside each other to facilitate collaboration, technical innovation and scientific progress. The Milner Therapeutics Institute provides a unique collaborative space and environment on the Cambridge Biomedical Campus (CBC) which is convenient for both AstraZeneca and CRUK, with the dedicated space the Functional Genomics Centre needs.



*Professor Greg Hannon
Director, Cancer Research UK
Cambridge Institute*



*Steve Rees
Vice President Discovery Biology,
Discovery Sciences,
R&D BioPharmaceuticals, AstraZeneca*



*Dr Ultan McDermott
Chief Scientist – Oncology Drug
Resistance, R&D Oncology,
AstraZeneca*



*Dr Hamish Ryder
Director, CRUK Therapeutic
Discovery Laboratories*

ONCO-INNOVATION AT THE CANCER RESEARCH UK CAMBRIDGE CENTRE

The Milner Therapeutics Institute is part of the Cancer Research UK (CRUK) Cambridge Centre, a dynamic collaboration of over 700 researchers, clinicians, and the pharmaceutical and biotech industries based in the Cambridge area. We share a common goal to deploy Cambridge innovation to better understand the biology and treatment of cancer. The long-term aim of working with Centre members is to develop the expertise, knowledge and innovative technologies needed to establish a personalised, integrated cancer medicine strategy that diagnoses cancer early and individually stratifies, treats and monitors all patients. Through the CRUK Cambridge Centre's Onco-Innovation programme, we provide opportunities for researchers to engage with our industry partners and initiate pre-clinical research collaborations, either in their own labs or in the Centre for Pathway Analysis.

The Milner Therapeutics Consortium currently has nine projects led by members of the CRUK Cambridge Centre.



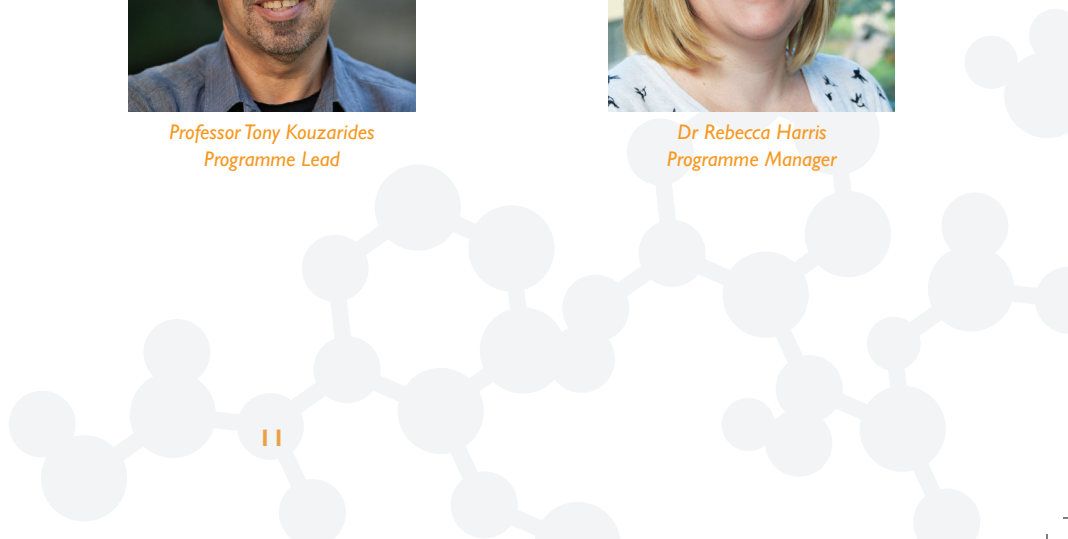
*Dr Susan Galbraith
Programme Lead*



*Professor Tony Kouzarides
Programme Lead*



*Dr Rebecca Harris
Programme Manager*





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 (p14), and the Alliance has been expanded with the Affiliated Company and Affiliated Institutions scheme to bring complementary expertise and resources to the community, and provide opportunity to extend collaborative links within and beyond Cambridge.

The Milner annual symposium is a key event for bringing our network together and building new collaborations. With more than 400 attendees (50% academics and 50% 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 an ongoing series of smaller workshops, sandpits 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.

80 ORGANIZATIONS ACROSS FOUR CONTINENTS



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 seven pharmaceutical companies: the University of Cambridge, the Sanger Institute and the Babraham Institute; and Astex, AstraZeneca, GlaxoSmithKline, Shionogi, Pfizer, Janssen R&D and Ferring. 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. Its remit is to consider the future direction of therapeutic research and suggest innovative projects for collective company funding. Research projects selected by the Innovation Board are executed by a 'task force' of academic and company groups with appropriate expertise.



There are now 19 ongoing projects across ten Departments and Institutes of the University and the Babraham. 15 of these are highlighted here and include a focus on oncology, infectious diseases, CNS and chemistry (an investment of £3.2 million by our industry partners) (opposite page). 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.

CURRENT CONSORTIUM PROJECTS

Lucy Colwell (Dept Chemistry)

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

Frank McCaughan (Depts Biochemistry & Medicine)

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

Gillian Griffiths (Cambridge Institute for Medical Research)

Strategies to influence T-cell mediated tumour killing. (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 (WT-CRUK Gurdon & Milner Institutes)

Insights into the use of PROTAC molecules as a therapeutic strategy. (GSK)

Gerard Evan (Dept Biochemistry)

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

Frank McCaughan (Depts Biochemistry & Medicine)

Identifying targets to prevent squamous carcinogenesis progression. (AstraZeneca)

Suzanne Turner (Dept Pathology)

Mechanisms of resistance to ALK inhibition in neuroblastoma. (AstraZeneca)

Bertie Göttgens (WT-MRC Cambridge Stem Cell Institute)

Capturing the early stages of acute myeloid leukaemia to evaluate new therapeutics. (AstraZeneca)

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 & Angela Roberts

(Depts of Psychology & PDN)

Improving drug discovery in CNS diseases. (Shionogi)

Gerard Evan & Cathy Wilson (Dept Biochemistry)

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

Emma Rawlins & Joo Hyeon Lee

(WT-CRUK Gurdon Institute &

WT-MRC Cambridge Stem Cell Institute)

Elucidating signalling pathways that drive lung development in improved organoid models.

(AstraZeneca)

AFFILIATED COMPANIES

The Affiliated Company scheme, established in October 2017, now includes 54 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.

PHARMA & BIOTECH



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AI & DATA SCIENCE



LIFE SCIENCES



OBRIZUM®



DIAGNOSTICS



INSTRUMENTS



AFFILIATED INSTITUTIONS

The Affiliated 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, 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 opportunities for the Milner Therapeutics Institute and its Global Therapeutic Alliance, and especially for our in-house company accelerator Start Codon.

OUR ORGANIZATIONAL STRUCTURE

INNOVATION BOARD

- Dr Susan Galbraith, *AstraZeneca*
- Dr David Andrews, *AstraZeneca*
- Dr John Lyons, *Astex*
- Dr Rab Prinjha, *GlaxoSmithKline*
- Victoria Higgins, *GlaxoSmithKline*
- Dr David Shields, *Pfizer*
- Dr Takeshi Shiota, *Shionogi*
- Dr Kai Stoeber, *Shionogi*
- Dr Morten Persson, *Ferring*
- Dr Armin Metzger, *Ferring*
- Professor Ludovic Vallier, *University of Cambridge*
- Dr Mathew Garnett, *Wellcome Trust Sanger Institute*
- Professor Michael Wakelam, *Babraham Institute*
- Dr Simon Cook, *Babraham Institute*
- Dr Lilian Alcaraz, *Janssen R&D*
- Dr Ann Connolly, *Janssen R&D*
- Professor Greg Hannon, *CRUK Cambridge Institute*

GOVERNANCE BOARD: UNIVERSITY OF CAMBRIDGE

- Professor Chris Abell
- Professor Abby Fowden
- Professor Richard Gilbertson
- Professor Patrick Maxwell
- Professor Andy Neely
- Professor Julie Ahringer
- Dr Renata Schaeffer
- Dr Michael Godfrey
- Dr Karl Wilson
- Professor Tony Kouzarides
- Dr Kathryn Chapman

MANAGEMENT BOARD

- Professor Tony Kouzarides
- Dr Kathryn Chapman
- Professor Greg Hannon
- Professor Ludovic Vallier
- Dr Mathew Garnett

SCIENTIFIC ADVISORS AT UNIVERSITY OF CAMBRIDGE

- Dr Sarah Bohndiek
- Professor Roger Barker
- Professor Carlos Caldas
- Professor John Danesh
- Professor Gordon Dougan
- Professor Rebecca Fitzgerald
- Professor Andres Floto
- Professor Tony Green
- Dr Meritxell Huch
- Professor Brian Huntley
- Professor Arthur Kaser
- Professor Nick Morell
- Professor Willem Ouwehand
- Professor Stephen O'Rahilly
- Dr Emma Rawlins
- Professor David Rubinsztein
- Professor Ken Smith

UNIVERSITY INNOVATION REPRESENTATIVES TO DATE

- Dr Zuzanna Brzoscko
- Dr Chiara Guiliano
- Dr Jenny Hirst
- Timothy Jenkins
- Aicha Massrali
- Dr Paulo Rodrigues
- Dr Simon Scott
- Dr Sven Sewitz
- Dr Carl Spickett
- Dr Joseph Poley-Wolf
- Mo Zhao

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
- 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
- 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

- Opportunities for 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 lecture series)

INVESTORS

- First sight of start-ups
- Access to research community, companies and start-ups at annual symposium and workshops

OUR FUNDERS



lifeArc



Jeffrey Cheah
Biomedical Centre

ACADEMIA

*Transforming pioneering
science into therapies*

INDUSTRY



**UNIVERSITY OF
CAMBRIDGE**

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