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The Milner Therapeutics Institute: an excellent model for engagement of academia with industry in the delivery of better medicines

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Abstract: The Milner Therapeutics Institute was officially launched on the 14th of March 2016 at Jesus College, University of Cambridge, UK. It is a new Institute that sits jointly within the School of Biological Sciences and the School of Clinical Medicine at the University of Cambridge, UK. The Institute has been made possible by a donation from an entrepreneur Dr Jonathan Milner and the University of Cambridge. The Milner Therapeutics Institute aims to foster close collaborative work between academics, clinicians and industrialists. This will help to build a world-leading ecosystem in Cambridge dedicated to the conversion and translation of scientific research into therapies of the future. The Institute will focus mainly on diseases such as: cancer, neurological disorders, immune-inflammation, and infection. However, any other therapeutic area of interest to industrial partners can potentially be pursued. The Institute consists of two arms (i) research laboratories and (ii) a global alliance, which consists of a Therapeutics Consortium, a set of Affiliated Companies with a portfolio and interest in therapeutics, a group of Affiliated Institutions with aligned vision and complementary research portfolios and Affiliated Venture Partners. The Capella Building, which will host the research laboratories, is currently being built on the Cambridge Biomedical Campus, and will open in Autumn 2018.

Keywords: Milner Therapeutics Consortium, Affiliated Companies, Affiliated Venture Partners, Affiliated Institutions, Global Alliance, Jonathan Milner, Tony Kouzarides, therapeutics, University of Cambridge, Cambridge ecosystem

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1. The background and the vision

Background

The Milner Therapeutics Institute consists of three main components, the first two of which are already established: (i) **Milner Therapeutics Consortium** (ii) **Global Alliance of 65 organisations** and (iii) **Milner Research Laboratories**, Figure 1 [1].

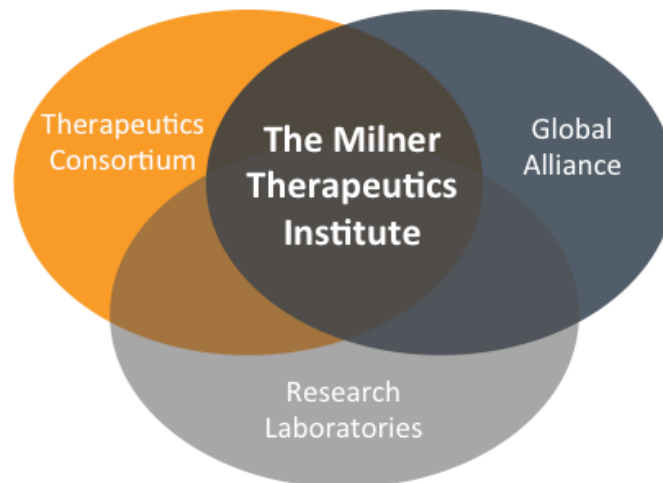


Figure 1. The Milner Therapeutics Institute structure.

The collaboration started over two years ago, in June 2015, when a research agreement was signed between the University of Cambridge, the Wellcome Trust Sanger Institute and the Babraham Institute with industry partners: AstraZeneca, Astex and GlaxoSmithKline. This was a beginning of **The Milner Therapeutic Institute** with an official launch in March 2016. Since then, four other pharmaceutical companies joined: Shionogi, Pfizer and Elysium in 2016 and Johnson and Johnson Innovations in 2017, Figure 2.

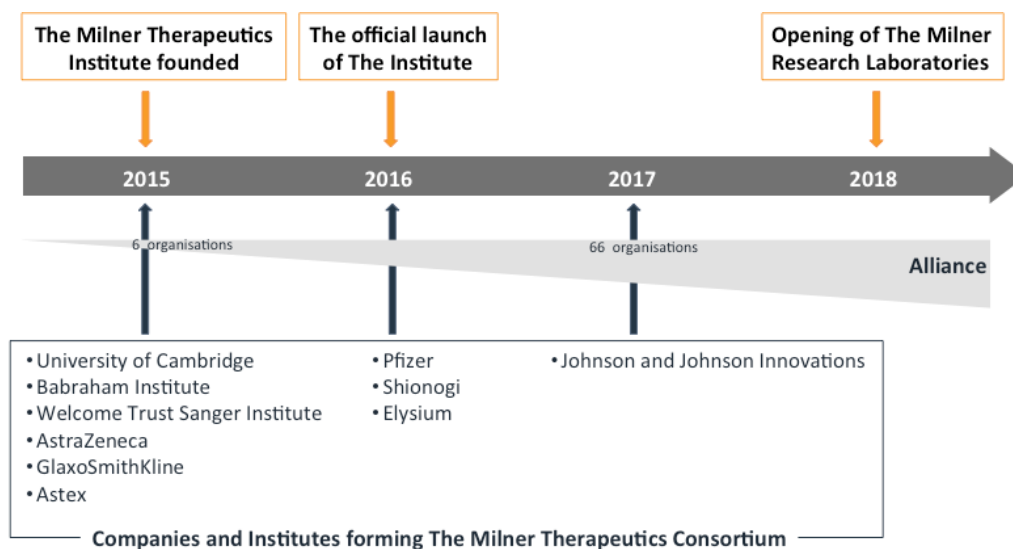


Figure 2. Timeline.

To form the global alliance that will be necessary to convert academic research into better therapies, the Institute has Affiliated with partners across the academic, biotech and venture sectors. The Affiliated companies range from spin-out companies with internal drug pipelines to contract research organisations and technology providers. The Affiliated Institutions are 14 academic institutions outside Cambridge, with access and links to companies and academics in the alliance. The Affiliated Venture Partners provide mentoring and potential funding opportunities to members of the alliance. In 2015, the Consortium comprised 6 organisations, in October 2017 the alliance is now formed of 65 organisations [1].

The building of the Milner Therapeutics Institute has been made possible by a £5m donation from a Cambridge entrepreneur Dr Jonathan Milner (Figure 3), who is a former member of Prof. Kouzarides' research group at the University of Cambridge. In 1998, after finishing his post-doctoral research work, Jonathan Milner together with Tony Kouzarides and David Cleevly founded a Cambridge-based biotechnology company Abcam [3].



Figure 3. Dr Jonathan Milner.

The research laboratories, based in the Capella building on the Biomedical Campus will house scientists from academia and industry working on complex, cell-based disease models to understand the underlying mechanisms of disease and to establish assays for genetic and chemical screening. There will also be a computational modelling group using machine learning to identify new targets across therapeutic areas and accelerator space to support entrepreneurs in the transition of therapeutic ideas into biotech companies.

Vision

The Milner Therapeutics Institute vision is to harness a global therapeutic alliance to convert groundbreaking science into better therapies. It delivers this by **connecting** academic institutions with pharmaceutical and biotech companies, **enabling** interdisciplinary, collaborative research projects throughout Cambridge, and **accelerating** the formation of new biotech companies with a therapeutic outlook. The joint forces of the intellect and knowledge of Cambridge researchers and clinicians together with the drug-developing capacity of the pharmaceutical industry creates a unique value within in the Cambridge Cluster [1].

2. Why is it needed?

One of the largest barriers to faster and more efficient therapeutic development is lack of effective collaboration between academia and industry. The Cambridge Cluster is the third most successful University innovation ecosystem in the world (only Stanford and MIT are rated higher) with over 340 life science and healthcare companies residing here. Here, the development of new therapeutics can be sped up to benefit patients locally, nationally and internationally.

The Milner Therapeutic Institute role is to break down the barriers to collaboration by identifying the right partner to work with, providing access to appropriate resource and expertise and supporting project negotiation. Active facilitation and strengthening of academic-pharma collaborations at earlier stages of the drug discovery process is key to progress. The Milner Institute is designed to make effective use of its global alliance and research laboratories to accelerate therapeutic research and drug discovery in Cambridge.

3. Who is involved?

The Milner Institute is directed by Professor Tony Kouzarides (who is also Deputy Director of the Wellcome Trust/Cancer Research UK Gurdon Institute) and managed by Dr Kathryn Chapman, Figure 4. The **Therapeutics Consortium** consists of three academic Institutions and seven pharmaceutical companies (Figure 2). Its role is to facilitate rapid exchange of information and reagents between Cambridge scientists and pharmaceutical and biotech companies and in some cases, provide funding for collaborative research. All research is expected to result in joint publications between academic and industry partners. Several MTAs and collaborative projects are already in place.



Figure 4. From left to right:
Prof. Tony Kouzarides (Director) and Dr Kathryn Chapman (Executive Manager).

The Innovation Board (Table 1) 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. The Consortium companies are able to fund collectively major projects of common interest. 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.

Professor Kouzarides said: “We hope many more pharmaceutical companies will join the Consortium and believe this form of partnership is a model for how academic institutions and industry can work together to deliver better medicines.” [2].

Table 1. The Innovation Board Members [1].

| Pharmaceutical Academic Centre | Company / | Name |
|-----------------------------------|-----------|--|
| AstraZeneca | | Dr Susan Galbraith, Vice President, Head of Oncology iMed, Innovative Medicines |
| | | Dr Sabina Cosulich, Director, Oncology Bioscience, Innovative Medicines |
| Astex | | Dr John Lyons, Senior Vice President, Translational Research |
| Elysium | | Dr Mark Morris, Head of Scientific Technology, Elysium |
| GlaxoSmithKline | | Dr Rab Prinjha, Vice President, Head of Epigenetics DPU |
| Johnson and Johnson Innovation | | Dr Richard Mason, Head of Johnson & Johnson Innovation |
| Pfizer | | Dr Ron Newbold, Vice President, External R&D Innovation |
| Shionogi | | Dr Takeshi Shiota, Senior Vice President, Pharmaceutical Research Division |
| | | Dr Kai Stoeber, Vice President, Global Innovation |
| Sanger Institute | | Dr Mathew Garnett, Group Leader, Translational Cancer Genomics |
| Babraham Institute | | Professor Michael Wakelam, Director |
| | | Dr Simon Cook, Group Leader, Signalling Programme |
| University of Cambridge | | Professor Tony Kouzarides, Deputy Director, Gurdon Institute |
| | | Professor Greg Hannon, Royal Society Research Professor, CRUK Cambridge Institute |
| | | Professor Ludovic Vallier, Senior Group Leader, Laboratory for Regenerative Medicine |
| | | Dr Kathryn Chapman, Executive Manager, Milner Therapeutics Institute |

In addition, **The Milner Institute** has in their portfolio 39 Affiliated Companies (Table 2). The purpose of the Affiliated Company Scheme is to engage small and medium size companies in addition to the large and established pharmaceutical and biotech firms. The Affiliated

Companies can contribute by providing technology or service, or sharing their existing drug development pipelines.

Table 2. Milner Affiliated Companies [1].

| Name | Short description |
|-----------------------------|--|
| Abcam | High-quality protein research tools |
| Active Motif | Enabling epigenetic research |
| Agilent | Offers products and support to meet lab needs |
| Aivivo | Data-driven precision medicine |
| Amgen | Biopharmaceutical company |
| Bioascent | Compound management services |
| Biomax | Systematic knowledge management |
| BTG | A specialist healthcare company |
| Cancer Research Technology | Cancer Research UK's Commercial Partnerships team |
| Cambridge Epigenetix (CEGX) | Technology and services to study DNA methylation |
| Cell Guidance Systems | Providing innovative reagents and research services |
| Censo Biotechnologies | Stem cell technologies to predict how drugs will behave |
| Charles River Laboratories | A variety of pre-clinical and clinical laboratory services |
| Cyclofluidic | Closed-loop structure activity platform |
| Definiens | Tissue Phenomics for developments in oncology |
| DefiniGEN | Human cell products for drug discovery and disease model generation |
| Diagenode | Innovative epigenetics solutions |
| Eagle Genomics | Software solutions for data-driven discovery |
| Exonate | Small molecule drugs modulating alternative mRNA splicing |
| Genedata | Innovative software solutions and domain-specific consulting services |
| Genestack | Biodata platform providing a collaborative ecosystem for discovery scientists |
| Healx | Identifies novel drug applications for rare diseases |
| Horizon Discovery | Products, services and research programs |
| Linguamatics | Software and solutions to help speed up the drug-discovery cycle |
| Medannex | Biotechnology company developing new treatments for patients with autoimmune diseases. |
| Metrion Biosciences | CRO delivering a range of ion channel drug discovery services |
| ModiQuest | Custom antibody generation and development |
| Nemesis Bioscience | DNA therapeutics to inactivate resistance in bacterial pathogens |
| O2h discovery | Investing in emerging life science and tech companies |
| PhoreMost | A new-model drug discovery company |
| Promega | Enzymes and other products for biotechnology and molecular biology |
| Proximagen | Discovery and development of novel small molecule therapeutics |
| Quid | A data searching, analysing and visualizing platform |

| | |
|--------------------------------------|--|
| Repositive | Efficient data access solutions to speed up genetic diagnostics |
| Selcia | Drug discovery, medicinal chemistry and 14C radiolabeling services |
| Sphere Fluidics | Screening and characterisation of single cells |
| Storm Therapeutics | Developing small molecule inhibitors of RNA-modifying enzymes |
| Strem Chemicals | Manufactures and markets specialty chemicals of high purity |
| Tailored Clinical Research Solutions | Consultancy in UK's clinical research sector |
| Ubiquigent | Ubiquitin, ubiquitin-like, and integrated signalling systems |

There are also 14 **Affiliated Institutions** from around the world including Spain, USA, Australia and South Korea (Table 3). The Milner Therapeutics Institute will connect and enable collaborative research between the affiliated institutions within the alliance. Cambridge Innovation Capital and Amadeus Capital Partners provide mentoring and potential funding opportunities.

The Milner Therapeutics Institute also draws on the intellectual power of the academic community to advise on specific projects and therapy areas. It has 17 senior scientific advisors from across the University (<http://www.milner.cam.ac.uk/scientific-advisors/>) who have expertise in diseases, models, technology and science related to the areas of interest to the Milner Institute. In partnership with Entrepreneurial Post-Docs of Cambridge and the Innovation Forum, the Milner Therapeutics Institute also has a team of Innovation Representatives who are embedded in the relevant Departments and Cambridge Institutes. They are a grassroots network of early-career scientists interested in therapeutic research. They proactively reach out to other scientists in the department and facilitate interactions between academics and the Milner Institute. With the permission of the Group Leader, they communicate the desire of scientists to connect with biotech and pharma companies within the Milner global alliance (<http://www.milner.cam.ac.uk/innovation-representatives/>).

Table 3. Affiliated Institutes [1].

| Affiliated Institutions | Website |
|---|---|
| Bio-Synergy Research Centre | http://www.biosynergy.re.kr/eng_main |
| Cancer Research UK | https://www.cancerresearchuk.org |
| CATAPULT Medicines Discovery | https://md.catapult.org.uk |
| CRG Centre for Genomic Regulation | http://www.crg.eu |
| CNIO | https://www.cnio.es/ing/index.asp |
| Cleveland Clinic | https://my.clevelandclinic.org/departments/genomics |
| ICR - The Institute of Cancer Research | https://www.icr.ac.uk |
| IRB Barcelona – Institute for research in Biomedicine | https://www.irbbarcelona.org/en |
| Johns Hopkins University | http://web.jhu.edu/administration/development/index.html |
| PENN CENTRE FOR INNOVATION | https://www.pci.upenn.edu |

| | |
|--|---|
| PeterMac | https://www.petermac.org |
| SYLVESTER (University of Miami Health System) | http://sylvester.org |
| UCL (Cancer Institute) | http://www.ucl.ac.uk/cancer |
| Yonsei University College of Medicine | http://medicine.yonsei.ac.kr/en/ |

4. Looking to the future

The Research Laboratories of the Milner Therapeutics Institute are going to be opened soon – in Autumn 2018 and will take the alliance to the next level. They will be situated in the Capella Building on the Biomedical Campus in Cambridge. The building will also house the relocated Wellcome Trust/MRC Cambridge Stem Cell Institute and the Cambridge Institute for Immunotherapeutics and Infectious Disease.

The Milner Therapeutics Institute Research Laboratories will be within walking distance of four University Science Institutes, a new AstraZeneca building, and adjacent to Addenbrooke's Hospital and the National Health services. It will also be an integral component of the Cambridge Cancer Centre. The Research Laboratories will have academic and industry scientists working pre-competitively next to each other at the bench exchanging ideas, knowledge and expertise. There will also be spaces for budding entrepreneurs who will have access to world-class facilities and mentors from the alliance. There are many ways to engage with the Institute through becoming a **Consortium** or **Affiliated Partner** or contacting them directly.

The Institute



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<http://www.milner.cam.ac.uk/>

References

- [1] The Milner Therapeutics Institute: <http://www.milner.cam.ac.uk/>
- [2] The Gurdon Institute – University of Cambridge: <http://www.gurdon.cam.ac.uk/news/milner-launch-event>
- [3] S. Silvia and K. L. Zapadka, The rise of Abcam: advancing life science research, Innovation & Impact, 2017

Karolina L. Zapadka is a Biotech Business Developer, Physical Science Consultant and Physical Chemist. Her academic work includes a double research Master diploma in Chemistry with a specialisation in Spectroscopy and Photochemistry from Jagiellonian and Lund University, a Ph.D. from University of Cambridge in Biophysics, Peptide Stability & Aggregation and Postdoctoral work between University of Cambridge and MedImmune. Karolina has a scientific background in several areas, including metabolic disorders, pharmaceutical product development, biologics stability & liquid formulations, protein self-assembly, cancer diagnostics, and polymer chemistry. For the past 8 years, she has been actively involved in Cambridge cluster, working for 2 years in the Cambridge based emerging biotech company Arecor. After industry, she went on to pursue a PhD at Chemistry Department, University of Cambridge. Karolina was funded by the Formulation Science Group in MedImmune. Working in MedImmune for more than 5 years, has given her experience in Big Pharma. Moreover, Karolina has extensive experience in valorisation of research outcomes in life science & healthcare together with business development in the private and non-profit sectors. She has lead successful high performance teams of up to 120 people in innovation in 15+ projects in several non-profit organisations. During this time, she has established, managed, and maintained a strong relationship of trust with different partners regionally, nationally, and internationally. Since early 2017 she has been Chief Executive and name partner of KLUZ Consulting, the bioinnovation business builder, which provides technical and strategy consulting services. Here, she worked on number of consulting projects for biotech companies, science parks and Business Schools.



Martyna C. Popis, Researcher at University of Cambridge, expert in stem cell and cancer research. Martyna completed her PhD in Stem Cell Research at the University of Cambridge, where she currently works as a Research Associate. Her research focuses on molecular biology and applications of stem cells in tissue regeneration and tumourigenesis. She specialises in RNA modifications and their potential application for new combinatorial cancer therapies. She has always felt a strong passion for valorisation of research. Throughout the years of her academic and extracurricular work she is well familiar with and actively involved in the Cambridge Cluster. During her PhD, she joined the Global Innovation Forum Ltd, where she set up and lead the Imagine IF! Business Idea Competition. Currently she works with the Cambridge Consulting Network, delivering market entry strategies for Life Science start-ups.



Kathryn Chapman is the Executive Manager of the Milner Therapeutics Institute within the University of Cambridge. Prior to this, Kathryn was Head of Innovation and Translation at the NC3Rs where she spent 10 years working with over 40 global pharmaceutical companies to improve efficiency and reduce animal use in drug development. She also initiated and directed a new challenge-led open innovation platform, CRACK IT which increases cross-discipline industry/academic partnerships in applied research and enhances investment in SMEs and University spin-outs. Kathryn generated transgenic models for drug development and disease modelling at the University of Manchester, Harvard Medical School, Wellcome Trust Sanger Institute and GlaxoSmithKline. She has been on international Review Panels, including for the Innovative Medicines Initiative (IMI), the BBSRC and Innovate UK, the 'Dragons Den' judging Panel for the Biotechnology Yes competition and holds an Honorary Professorship at Coventry University.

