



THE INNOVATION GAME



TRANSLATIONAL RESEARCH OFFICE (TRO):
www.ucl.ac.uk/translational-research/

THERAPEUTIC INNOVATION NETWORKS (TINS):
www.ucl.ac.uk/school-life-medical-sciences/about-slms/office-vice-provost-health/tins

UCLB:
www.uclb.com/

Impact Objectives

- Use the Therapeutic Innovation Networks (TINs) to harness the translational experience and infrastructure of UCL and its NIHR Biomedical Research Centres to provide education, support and encouragement to early career scientists to translate their novel science
- Maximise University College London's ability to quickly and efficiently translate disease-related discoveries into high-quality therapeutic interventions and tangible treatments for patients
- Ensure all TINs have an industry network with the aim of using their know-how and resource to aid the development of the portfolio

The innovation game

Professor David Lomas discusses the Therapeutic Innovation Networks (TINs), which are facilitating and accelerating enterprise at University College London (UCL), UK



Can you begin by introducing yourself?

I am Vice-Provost (Health) at UCL, Head of the School of Life & Medical Sciences and

Head of the UCL Medical School. I also serve as the Academic Director of UCL Partners' Academic Health Science Centre and as a Director of The Francis Crick Institute, Africa Health Research Institute, MedCity, Non-Executive Director of UCLH and a Trustee of the British Heart Foundation. I originally trained in medicine at the University of Nottingham, UK, then worked as a junior doctor in Birmingham before moving to Cambridge to undertake my PhD. I then moved to UCL in 2013.

What is your role at UCL?

My role is to coordinate the activities in health across UCL and, more specifically, to help the Deans of the four Faculties (Brain Sciences, Life Sciences, Medical Sciences and Population Health Sciences) within the School of Life and Medical Sciences, to deliver their vision for research, education and enterprise. I also have a significant external role especially liaising with our partner hospitals and the wider regional and national research landscape.

What are the Therapeutic Innovation Networks (TINs)?

The TINs (Therapeutic Innovation Networks) are communities of interested principal investigators brought together to share experiences of developing and

commercialising biomedical therapies. These forums are also used to discuss barriers and hurdles, and approaches to overcome them. The Cell, Gene & Regenerative Medicine TIN has been very effective in pulling the community together and articulating our strengths in this area. UCL has more research and clinical activity in the area of cell and gene therapy than any other university in the UK and, indeed, has a clinical portfolio of comparable size to that of the whole of Spain or Italy. We are working to develop similar interest groups around Biologics, Diagnostics, Devices, Small Molecules and Drug Repurposing, each aligned to its own industry network.

What are you hoping to achieve through the TINs?

Our aim is to bring the active therapeutic researchers together with professional support and expertise available through the Translational Research Office (TRO), our Drug Discovery Groups, UCL Business, Innovation & Enterprise, Central Research Services, the Joint Research Office, Clinical Trials Units, and the NIHR Biomedical Research Centres at UCL Hospitals, Great Ormond Street Hospital and Moorfields – to facilitate and accelerate enterprise at UCL.

What do TINs contribute to efforts to further translate research into effective therapies?

The TINs allow us to bring together interest groups, share best practice and work together to overcome many of the observed hurdles such as regulatory obstacles. They also allow us to survey the landscape within UCL and further afield, and raise awareness

of our national and international standing. For example, we have used the TINs to assess our strengths and weaknesses in cell, gene and regenerative therapies, and work out how we can collaborate effectively with industry and our London partners: King's College London, Imperial College London and Queen Mary University of London. This allows for economy of scale, more rapid translation and more effective competition for research and enterprise income, accelerating the delivery of these novel therapies to our patients.

Are there plans for the establishment of further TINs?

We are working to establish the current TINs before looking to expand to other areas. In this respect, we have just been awarded a Wellcome Trust Translational Partnership Award to provide further support for the TINs over the next two years.

Where do you see translation generally progressing in the coming five to 10 years?

I see major changes in cell, gene and regenerative therapies, which will require innovative approaches to funding and close engagement with the regulatory authorities, with health economists/the National Institute for Health and Care Excellence for adoption and with the National Health Service for mainstream clinical delivery. There will also be major developments in the areas of big data and artificial intelligence (AI) that may require a different model of data privacy, with ethical consideration regarding commercialisation that will be acceptable to the public. ●

Thriving networks

Therapeutic Innovation Networks (TINs) at University College London (UCL), UK, with the support of the Translational Research Office (TRO) led by Jane Kinghorn, are helping to accelerate research translation by uniting the right mix of knowledge and expertise and igniting innovation

University College London (UCL) working alongside UCL Business (UCLB), has a track record of translational discovery and innovation typified by IP generation, collaborative research with industrial partners, licensing and commercialisation. Some significant successes include:

- Basiliximab (Simulect), used in the treatment of renal transplant patients, was discovered in UCL and co-developed with Novartis;
- The UK's first gene therapy trial, to correct adenosine deaminase severe combined immunodeficiency (commonly known as "bubble baby" disease), was carried out at Great Ormond Street Hospital, London. This therapy under development at UCL/GOSH BRC with MRC support, in partnership with Orchard Tx (UCL spin-out) is completing pivotal registration trials with BLA/MAA submission planned in 2020;
- UCL with their strategic partner Eisai Co., Ltd. have commenced preparations for Phase I clinical studies on E2814, their first joint clinical candidate, an anti-tau monoclonal antibody designed to slow the progression of Alzheimer's disease and other tauopathies.

University College London have taken steps to build upon and accelerate this strong academic drive to translate their novel biomedical science. This is being maximised by coordinating professional support and sharing knowledge through the Therapeutic Innovation Networks (TINs).

ACCELERATING TRANSLATION

Translation is a team sport that requires multiple players to be aligned and pulling in the same direction. The Translational Research and Enterprise Accelerator Committee (TREACC) brings together resource holders with experience in financial, regulatory, commercial and behavioural drivers, with a view to accelerating clinical translation. With all of these stakeholders involved, priorities can be established, hurdles identified in a timely manner, stop-

go decisions expedited and measures put in place to make the translational pathway as smooth as possible. A current project is working towards harmonising the principles and practices under which UCL and partner BRCs operate when interacting with third parties to access our data with a view to speeding up the contracting process. TREACC together with the TINs are establishing UCL and its partners as the 'go-to' place for organisations looking to partner with academia and hospitals in research, education, innovation and industrial engagement along the entire value chain of therapeutic development.

THERAPEUTIC INNOVATION NETWORKS (TINs)

TINs are multidisciplinary networks that bring together research in major therapeutic modalities from across UCL and partner NIHR Biomedical Research Centres (BRCs). In addition to enabling UCL to maximise its ability to quickly and efficiently translate disease-related discoveries into high-quality therapeutic interventions, the TINs also provide high-level oversight of UCL's therapeutic portfolio, and represent an integral component of its Translational Research and Enterprise Acceleration strategy. ►

Small Molecule TIN

A network of those focused on small molecule drug discovery at UCL committed to blending experience in order to achieve high quality drug discovery in an academic setting.



Knowledge – applied drug discovery experience gained from years in pharma, biotech and academic setting; knowledge of available funding for drug discovery; extensive industry, biotech and CRO network

Expertise – target identification and validation; medium and high throughput screening; access to small molecule libraries; computational and medicinal chemistry; high content imaging, CRISPR libraries, knockout cell panels and robotic platforms; access to patient tissue, cells and derived iPSC cells; access to clinical expertise and patient public involvement

Access to Compound Libraries – signed a strategic collaboration agreement with Astra Zeneca (Nov 2018) within which UCL academics can access the AZ screening collection on mutually agreed targets together with a limited number of UCL-chosen targets

Network Activity – organise a series of seminars with biotech, industry, funders, CROs and consultants. Events have included "Dragons Den" where UCL projects were pitched to external VC dragons with the chance of winning £10k; "AI in Drug Discovery", a workshop linking academics, clinicians and industry to address current challenges

Industry Club – AZ, GSK, Merck and Eisai have joined the Small Molecule TIN to provide advice and sharpen UCL early drug discovery projects



The CGRT network has thrived because of the colocation of excellent scientists and clinicians with well-defined patient groups

UCL has established TINs in small molecules, cell, gene and regenerative medicine (known collectively as ATMPs), biologics, repurposing, devices and diagnostics that focus on connecting the interested community around a particular therapeutic modality. Each TIN seeks to link UCL's novel science with professional expertise to accelerate therapeutics for patient benefit. In addition, they are also looking to harness the power of big data, artificial intelligence (AI) and new technologies. This is happening via the coordination and promotion of scientific and clinical teamwork across UCL and its partners, and enabling best practice and important knowledge to be disseminated to a larger audience (please see box on small molecule TINs).

The Translational Research Office (TRO) facilitates engagement with SMEs in order to lower the activation energy for principal investigators, increase engagement and, hence, aid translation for patient benefit. The intention is for each TIN to have a small industry network with the aim of using their know-how and resource to aid the development of the TIN portfolio. In addition, they will identify areas of mutual interest for future industry needs in the areas of education and manufacturing, as well as providing industry with a mechanism to develop their portfolio of opportunities. The TINs bring together the strengths of our three partner Biomedical Research Centres (UCL Hospitals, Great Ormond Street Hospital and Moorfields) into a single portfolio that can be advertised to the wider community.

Professor Lomas provides insight into the Cell, Gene and Regenerative Medicine (CGRT) TIN and why it has seen success: 'The CGRT network has thrived because of the colocation of excellent scientists and clinicians with well-defined patient groups. Patients are often referred to our local hospitals for diagnosis and therapy. As part of their evaluation and establishment of diagnosis, they often undergo genetic testing. This has allowed UCL to be a pioneer in gene discovery for rare diseases,'

he says. 'The logical progression from that is to correct the genetic abnormality with novel therapies. Thus, we are world leaders in cell and gene therapy in rare childhood diseases, leukaemia and cancer. The added value of the TIN has been to collectively describe the scale of the activity and the international standing of UCL and its partner hospitals in delivery of these novel therapies. By convening the TIN, a shared vision for where the community wish to progress to has provided a roadmap for UCL to begin to actively influence future policy regarding internal and external funding, future needs in manufacturing, regulatory policy and supporting the government's industrial strategy by anchoring UK born SMEs in the country, helping them to grow.'

PARTNERSHIP IS THE KEY TO SUCCESS

The TINs and TREACC are flexible, professional and responsive structures that are highly networked and aligned to deliver a step-fold change in delivering biomedical translational impact at UCL. They will allow us to better align with the UK government Industrial Strategy, as well as the Accelerated Access Collaborative. Such coordination makes UCL and its BRC partners the 'go-to' place for organisations that wish to partner with academia/hospitals in the areas of research, education, innovation and industrial engagement across the whole value chain of therapeutic development. **Partnerships are pivotal to UCL's success and we are continually seeking to create new, multidisciplinary alliances with patient-centric organisations from a variety of sectors. If you are interested in partnering with UCL around the translation of a specific therapeutic modality, please contact the TRO.**

This is the second article in a series of three highlighting some of the translational infrastructure available to researchers at UCL, their BRCs and potential industry partners. The first (published Dec 2018) explored the bridge between academia and industry facilitated by the TRO and the third (next issue) will focus on educating the next generation of translational scientists. ●

Project Insights

FUNDING

- NIHR Biomedical Research Centres (BRC) affiliated with UCL*
 - Wellcome Trust Translational Partnership Award (214046/Z/18/Z)
- * Supported by researchers at the National Institute for Health Research University College London Hospitals • Biomedical Research Centre, Great Ormond Street Hospital Biomedical Research Centre and Moorfields Hospital Biomedical Research Centre.

COLLABORATORS

Translational Collaborators at UCL: UCL Business • Research Services • Joint Research Office • Institute of Clinical Trials and Methodology • Clinical Research Facilities, Biomedical Research Centres (University College London Hospitals, Great Ormond Street Hospital, Moorfields Hospital) • UCL Partners • Innovation & Enterprise

CONTACT

Dr Jane Kinghorn

Director, Translational Research Office (TRO)

T: +44 2076798119

E: j.kinghorn@ucl.ac.uk

TWITTER: @UCLTRO

W: **TRANSLATIONAL RESEARCH OFFICE (TRO):** www.ucl.ac.uk/translational-research/

THERAPEUTIC INNOVATION

NETWORKS (TINS): www.ucl.ac.uk/school-life-medical-sciences/about-slms/office-vice-provost-health/tins

UCLB: www.uclb.com/

PROJECT CONTACT BIO

As Director of the Translational Research office, **Jane Kinghorn** is responsible for a team of highly experienced industrial translational scientists tasked with establishing the organisational culture, capability and processes necessary to deliver the UCL and BRC's mission of 'Accelerating translation for health and wealth'. Dr Kinghorn has extensive experience in developing therapies to clinical benefit gained from over 25 years working in large pharma and academia. Her experience has spanned the drug discovery pathway from target validation, lead optimisation and candidate selection through to the clinic and to marketing authorisation.