Department of Health

DEPARTMENT OF HEALTH DESIGNATED ACADEMIC HEALTH SCIENCE CENTRE (AHSC)

2016/17 ANNUAL REPORT

Note: Please note this form should be completed in font no smaller than 10-point Arial.

1. ACADEMIC HEALTH SCIENCE CENTRE DETAILS

Name of the Department of Health Academic Health Science Centre:

UCLPartners

Contact details of the DH AHSC lead to whom any queries and feedback on this Annual Report will be referred:

Name: Professor David Lomas

Job Title: UCLPartners Academic Director and UCL Vice Provost (Health)

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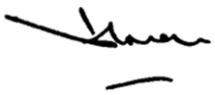

Signed:

2. OVERVIEW OF ACTIVITIES (no more than 4 pages)

Please provide a brief overview of activities for your AHSC for 2016/17 financial year, addressing the following points:

Progress with further aligning the strategic objectives of the NHS providers and universities in order to harness and integrate world-class research, excellence in health education and patient care:

Over 2016/17, our AHSC has continued to increase alignment through our six 'Academic Medical Centres' (AMCs) in the areas of: i) Neuroscience; ii) Child Health; iii) Infection, Immunity and Inflammation; iv) Cancer; v) Cardiovascular; and vi) Eyes and Vision. Crucially, these also map on to the NIHR Biomedical Research Centres (BRCs) that fall within UCLPartners: Great Ormond Street Hospital (GOSH)-UCL Institute of Child Health, University College London Hospital (UCLH)-UCL, Moorfields-UCL Institute of Ophthalmology (IoO), Barts and The London School of Medicine and Dentistry-Queen Mary University of London (QMUL). Our four BRCs provide critical mass and resource from which to enable our AMC translational strategies and in 2016 NIHR awarded our BRCs a combined total of >£170m over five years. The GOSH, UCLH and Moorfields BRCs also secured >£14m in the recent NIHR Funding Clinical Research Facilities for Early Translational (Experimental Medicine) Research competition. Each AMC continues to be engaged in a programme of strategic capital development to build truly joint NHS-academic facilities to undertake world-leading biomedical research and patient care. These projects require a fundamental cultural commitment to partnership working at all levels of the organisations involved.

As reported previously, our AHSC has also established cross-cutting Domains, which are cross-disciplinary communities that harness the breadth and depth of relevant research across UCLPartners and support the delivery of innovative patient-targeted medicines and therapies. In 2016/17 the Personalised Medicine Domain has continued to support the AHSC's participation in the North Thames NHS Genomic Medicine Centre, which is recruiting participants for the 100,000 Genomes Project (top national recruiter for rare disease cases; third highest recruiter for cancer). The Domain Early Careers Network held a successful first symposium in November 2016. The Domain has also developed plans to launch a virtual Institute of Personalised Medicine and set up an accelerator to enable research projects to be commercialised.

The Populations and Lifelong Health Domain supported the process of UCL and the London School of Hygiene & Tropical Medicine (LSHTM) becoming academic partners with the University of Kwa-Zulu Natal in the Africa Health Research Institute, a new interdisciplinary research institute in South Africa to fight tuberculosis, HIV and related diseases. The venture was made possible through £63m in grants from the Wellcome Trust and the Howard Hughes Medical Institute. The Domain also supports funding bids (e.g. UCL and LSHTM secured one year's bridging funding from Wellcome Trust *Our Planet, Our Health* scheme), and brings researchers together via community building events.

At an operational level, alignment is enabled through the six AMC Boards, chaired by the AMC Programme Directors (PDs), which bring together colleagues from the relevant NHS Trusts and University partners, BRCs, Academic Health Science Network (AHSN), Collaboration for Leadership in Applied Health Research and Care (CLAHRC), informatics, education, and care, to enable a collaborative approach and ensure sharing of best practice. The PDs meet regularly at AHSC Planning and Performance Executive meetings.

Summary of progress against specific short, medium and long–term objectives in full application:

***Research*:**

Short term: *(i) Develop metrics:* The AHSC commissioned a metrics analysis from Elsevier's 'SciVal' at the outset of its five year term, from which to benchmark progress. We have also drawn on metrics provided by RAND for the BRC accreditation process to supplement this understanding.
(ii) Create cross-cutting initiatives: Cross-cutting Domains established with dedicated leadership and coordination support in: Personalised Medicine; Populations and Lifelong Health; and Informatics.
(iii) Enhance AMC Programme coordination: A team of research coordinators, partnership and project coordinators, and industry partnership managers provide support to the AHSC.
(iv) Exploit '*Therapeutic Innovation Networks' (TINs):* The Cell & Gene Therapy & Regenerative Medicine TIN has built on an in-depth review of UCL activity to support strategic bids (e.g. BRC renewals), share expertise, and drive collaborative working (workshop outcomes, UK Regenerative Medicine Platform bid), all activities contributing to the strengthening of the community. Leads have been identified for the Small Molecule and Biologics TINs and reviews of UCL activity have been undertaken. The Small Molecule TIN has also begun developing plans for a Small Molecule Industry Club, working with a number of companies around the formulation of early drug discovery projects from exciting UCL science.
Medium term: *(i) Francis Crick Institute 'attachments' (i.e. secondments/satellites/sabbaticals):* We have made 3 joint strategic appointments and participated in 3 annual recruitment rounds for Crick 'attachments'. UCL currently has ~50 staff in 'attachments' at the Crick, with third round results to be announced.
Long term: *(i) Forge links with Oxford and Cambridge:* UCL, Oxford and Cambridge are part of the Alzheimer's Research UK (ARUK) Drug Discovery Alliance, which has seen the establishment of an ARUK Drug Discovery Institute at each institution, charged with working collaboratively in dementia research. We have links with Oxford and Cambridge through MedCity and the Stevenage Bioscience Catalyst (Cambridge).

(ii) Establish an international partnership per AMC: The AMCs are progressing partnerships with centres with complementary strengths e.g. Neuroscience with the Neuroscience Center Zürich; Infection Immunity and Inflammation with the Africa Health Research Institute, University of Zürich and Duke-NUS Medical School; Child Health is exploring partnerships with SickKids Hospital, Toronto, and Boston Children's Hospital, and has established links with Chulalongkorn University in Thailand (through British Council/Newton Fund funding) and Chongqing Children's Hospital in China.
(iii) Achieve world-class outputs in all AMCs: See AMC Programme progress below.

***Education*:**

Short term: *(i) Progress clinical PhD programmes:* UCL has a Wellcome Trust funded clinical PhD programme and has led the development of the NIHR BRC/Francis Crick Institute Clinical Training Fellowships Scheme. UCL has also set up a national PhD exchange programme for NIHR infrastructure.
(ii) Establish UCLPartners Quality Improvement (QI) Fellows: UCLPartners established the Improvement Fellows programme in 2016 to create a network of people who will support each other and their organisations in their improvement work, delivering better results for patients and populations. The first cohort of 22 Fellows was selected in January 2016 and completed the programme at the end of the year, but continues to work together as a network. Following that success an expanded second cohort was selected in December 2016 and includes 38 individuals from a range of backgrounds; from primary and acute care, to mental health and social services, junior doctors and GPs to allied health professionals and general management.
Medium term: *(i) Undergraduate programmes to accommodate 'precision medicine' and introduction of multi-professional modular Masters:* AMC leads continue to actively encourage the embedding of personalised medicine in programmes, e.g. UCL's Applied Medical Sciences BSc.
(ii) Roll out Academic Careers Office provision across the partnership: The UCL Academic Careers Office offers courses that are available to all, e.g. miniMDs and ADAPT personal development schemes.
Long term: *(i) Research awareness & critical appraisal skills permeate education programmes:* In progress.

***Care Quality*:**

Short term: *(i) Adoption and promulgation of quality scorecard:* Following the roll out during 2015/16 of the Life Quality Improvement (QI) platform we have increased our user base and are currently the largest user of Life QI across the network of 15 AHSNs. The Life QI platform is used by over 400 organisations in nine countries and helps organisations and individuals improve health & social care in communities. UCLPartners has 1,336 registered users on Life QI at the end of Q4, including 38 NHS organisations working on 506 QI projects. Visibility of the QI projects and professionals across the UCLPartners geography allows sharing of learning and the opportunity to collaborate with local and national QI communities.
(ii) Develop systematic application of best practice PPI: UCLPartners has developed and maintained a network for Involvement and Engagement Leads to support systematic application of best practice. Over 160 staff are involved and more than 60 external organisations are providing advice and guidance on improving practice. We continue to work on this with the NIHR National Director for Patients & the Public, and Chair of INVOLVE, who is hosted at UCL. Children and families are actively involved in the GOSH-ICH BRC. Moorfields-IoO BRC has the most participants ever in research priority setting with the James Lind Alliance.
(iii) Forge close links with CLAHRC to inform research agenda: Close links are established via the AHSC Populations and Lifelong Health Domain and CLAHRC representation on key AMC steering groups.
(iv) Establish national networks in areas of specialist expertise (e.g. rare diseases): UCL has been selected as the national 'hub' of the new UK Dementia Research Institute, a joint £250m investment into dementia research led by the Medical Research Council, alongside the Alzheimer's Society and ARUK. The AHSC also continues to progress the Zayed Centre for Research into Rare Disease in Children, a new national Institute that will allow us to more accurately diagnose, treat and cure children with rare conditions.
Medium term: *(i) Introduce health informatics to subserve major integrated pathways aligned with AMCs:* Our vision is to support the development of aligned, collaborative and interoperable infrastructure, technology and systems across and between partner organisations and to be a leading partner in Health Data Research UK. Our approach is to: convene stakeholders from different sectors and localities to share information, establish best practices, and enable interoperability across the broadest possible geography; improve cross-organisational and multi-institutional analysis, traceability and reproducibility; create harmonised approaches to clinical and technical standards; foster a culture of innovation and discovery; and commit to responsible data sharing to promote the highest standards for ethics and trustworthy use of data.
Long term: *(i) Achieve demonstrable improvement in each AMC:* See below.

A brief summary of progress made in each approved AHSC programme as detailed in full application:

Neuroscience AMC:

- UCL has been selected as the national 'hub' of the new UK Dementia Research Institute, as stated above. The Institute will be catalytic in the UK's research efforts to diagnose, treat, care for and prevent dementias, including Alzheimer's, Parkinson's, Huntington's disease and vascular dementia.
- An online patient support tool for newly diagnosed MS patients with anxiety and depression, developed in partnership between UCLPartners, King's Health Partners and Shift MS, is now being implemented.

- The Royal Free London has agreed to adopt the UTI treatment pathway in MS as a digital exemplar.
- Barts Charity has awarded £1.5m in funding to set up a new Centre for Preventive Neurology in the Wolfson Institute of Preventive Medicine at QMUL.

Child Health AMC:

- The AMC continues to progress the new Zayed Centre for Research into Rare Disease in Children, a partnership between UCL, GOSH, and the Great Ormond Street Hospital Children's Charity. The facility is under construction and scheduled to be completed in 2018.
- GOSH is developing an electronic patient record (EPR) system and research innovation platform. This would be integrated and ultimately accessible across UCLPartners.
- Cerliponase alpha was approved by the European Medicines Agency following the BioMarin-sponsored first-in-human study of the enzyme in CLN2 type Batten disease at GOSH.
- The NHS will offer non-invasive pre-natal testing (NIPT) to pregnant women following the publication of Professor Lyn Chitty's research on implementation in the BMJ in 2016.
- An epilepsy working group has been initiated to discuss collaborative bid opportunities across the partnership, and joint working is also planned across the translational pathway for asthma.
- A pan-London initiative across the three London AHSCs is exploring areas for close collaboration and joint funding bids for Child Health.

Infection, Immunity and Inflammation (III) AMC:

- The AMC continues to progress the Institute of Immunity & Transplantation, a new international centre of excellence in immunology research, developed in partnership between UCL, Royal Free London NHS Foundation Trust and the Royal Free Charity. £10m research funding was secured in the past 6 months.
- The TB Network is developing plans to extend the **el**ectronic **C**linical **I**nfection **D**atabase (elCID) to capture clinical TB data and roll out across the partnership to improve links between research initiatives, clinical data and patient management.
- A joint UCL-QMUL PhD programme in inflammation has been developed (up to 12 posts over three years), part funded by industry.
- Cell Medica has invested ~£3m to develop modified T cell receptor products for the treatment of cancer.
- UCL and QMUL co-hosted the annual Infection, Immunity & Inflammation Symposium in November 2016 attended by 300+ delegates. The 3rd LSHTM/UCL World TB Symposium Day was held in March 2017 (~300 delegates) and two Public and Patient Advisory Group meetings have also been held.

Cancer AMC:

- After a successful Expression of Interest application, the Cancer AMC has been invited to submit a full bid for a Cancer Research UK Major Centre - a partnership between UCL, QMUL, King's Health Partners and the Francis Crick Institute. The Child Health and III AMCs have also contributed to this bid.
- The AMC has continued its links with the NHS Cancer Vanguard project to transform early diagnosis and detection of cancer and improve quality, efficiency and the care of the patients with the resubmission of a £15m Cancer Alliance funding bid for work from 2017-2019.
- The UCLH Cancer Collaborative was successful in securing national Cancer Alliance funding of £2.2m for new models of supporting cancer patients after treatment over 2017-19.
- In November 2016, Phase III clinical trials funded by STEBA Biotech showed that 'vascular-targeted photodynamic therapy' for low-risk prostate cancer kills cancer cells while preserving healthy tissue.

Cardiovascular AMC:

- A site has been identified for the joint QMUL/UCL Cardiovascular Device Innovation Centre. The Centre was awarded £3.1m in European Regional Development Fund (ERDF) funding in 2017, in addition to the £10m already raised. Two Devices Chairs started in post in March 2017, funded by Barts Charity.
- The NIHR UCLH BRC Bloomsbury Centre for Clinical Phenotyping was completed in May 2017.
- A British Heart Foundation PhD Studentship Scheme with 20 students was awarded to QMUL and UCL and multiple new Programme Grants were awarded.

Eyes and Vision AMC:

- The research collaboration with DeepMind Health applying artificial intelligence on OCT scans continues to make significant progress, in particular in developing models directly relevant to a clinical workflow. The segmentation and diagnosis prediction models are producing impressive early results, to be announced later in 2017. Engagement is ongoing with NHS England and if adopted this could be revolutionary for the management of chronic disease and also have a significant impact on trials, treatments and managing the huge eye disease burden in the NHS.
- The AMC continues to progress the vision and plans for a new, unique, world-leading joint UCL and Moorfields facility, including plans to expand the joint educational agenda.
- A new angiogenic molecule (LRG-1) has been discovered (Nature) and a novel antibody trial is commencing, supported by the largest grant awarded by the MRC DPFS scheme (£55m).
- The Athena Vision/MeiraGTx partnership is currently setting up three new studies to open in 2017 with a new vector facility in London following major investment from the USA in the UK.

Summary of the AHSC's contribution to economic growth, including partnerships with industry:

UCLPartners' focus on wealth generation has enabled further success in 2016/17, aided by the efforts of UCLPartners, UCL's Translational Research Office (TRO), UCL Business (UCLB), & NHS Trust R&D offices:

- *Investment into novel therapies:* Since the launch of the £40m Apollo Therapeutics Fund, the AHSC has been awarded funds to develop two novel therapies: a cell therapy (the Moorfields UCL IoO stem cell) for the treatment of retinal degeneration (£2m) and a novel gene therapy approach for the treatment of Bardet-Biedl Syndrome (£873k).
- *Company spin-outs:* Three companies have successfully spun out this year with investment from Syncona, F-Prime Capital and the UCL Technology Fund. **Achilles Therapeutics Ltd** launched with funds of £13.2m to develop immunotherapies for cancer. **Orchard Therapeutics** launched with £21m series A funding to develop programmes focusing on restoring normal gene function in primary immune deficiencies, metabolic diseases and haematological disorders. **SmartTarget Ltd** announced the launch (September 2016) of a new CE certified device for the detection of prostate cancer.
- *Clinical success of novel therapies:* We continue to see advancement of our licensed novel therapies in the clinic with the recent announcement of positive interim data on nine patients by **BioMarin Pharmaceutical Inc** from an open-label phase I/II clinical trial of BMN 270, an investigational gene therapy for severe haemophilia A. In addition the **Cell and Gene Therapy Catapult**, alongside UCLB and Imperial Innovations, announced (April 2016) a positive interim review in the phase I/II trial conducted by Catapult Therapy TCR using a T cell therapy to target acute myeloid leukaemia (AML).
- *Collaborations with SMEs:* UCL established a presence at the **Stevenage Bioscience Catalyst** (SBC) in 2014 with three labs operating. One project has successfully led to a £16m collaborative initiative in inflammation and fibrosis with GSK, MRC and four other Universities on the Experimental Medicine to Explore New Therapies (EMINENT) network. The SBC continues to be a viable option for UCL spin-outs with three currently in residence: Puridify, Algafy and Keregen. We have also worked closely in 2016/17 with **MedCity** to develop stronger links to SMEs in the south east by actively participating and promoting the *Collaborate to Innovate* funding scheme aimed at academics addressing industry challenges. Over 2016/17 we helped 18 SMEs forge links with UCLH/UCL academics who submitted applications to the funding scheme and five of these joint applications were successful.

The UCL TRO continues to act as a catalyst for enterprise activity, working closely with the enterprise community across London and the south east to promote the AHSC's strengths. Cell, gene and regenerative therapy is a considerable strength of the AHSC and has been identified as a key area for development as part of the UK's Industrial Strategy, including the creation of a commercial vector facility by US firm MeriaGTx following acquisition of the UCL Moorfields spin-out Athena Vision. In conjunction with MedCity, the UCL TRO has generated a report quantifying the academic pan-London requirements for Good Manufacturing Practice (GMP) manufacturing in cell and gene therapy and regenerative medicine over the next five years (2017-2021). This information and the recommendations will be fed into the Advanced Therapy Manufacturing Taskforce with the aim of influencing the proposed Industrial Strategy investment into GMP facilities to where it is most needed.

Progress on the development and delivery of an appropriate e-Health informatics platform:

Health informatics: UCLPartners continues to work closely with the Farr Institute for Health Informatics Research and the MRC eMedLab to support the development of a biomedical informatics platform linked across early and late stages of translation, which demonstrates scalability across disease programme areas.

Discovery East London: The AHSC supports the Discovery East London project, hosted by the Clinical Effectiveness Group at QMUL. The project aims to develop a Learning Health System for the 1.1m population in east London, underpinned by a vendor-neutral data sharing informatics platform across four Clinical Commissioning Groups and two acute trusts.

Trusted Research Environment for London: The three London AHSCs and AHSNs have jointly commissioned Tim Hubbard and Daniel Ray from the Farr Institute London to specify and create a Trusted Research Environment for London to facilitate research over the whole London population.

Centres of Global Digital Excellence: The Royal Free London NHS Foundation Trust and Luton & Dunstable University Hospital NHS Foundation Trust were announced as two of the 12 national Centres of Global Digital Excellence, which aim to deliver pioneering approaches to digital services.

Genomics: UCLPartners is a partner in Genomics England. Led by GOSH, seven NHS Trusts in north London are part of the North Thames Genomics Medicine Centre (NTGMC), which is recruiting patients to the 100,000 Genomes Project to support the delivery of more personalised diagnosis and targeted therapy for patients with cancer and rare diseases. As of May 2017, NTGMC had recruited over 25% of the total national recruitment figures: 28,799 rare disease cases (27% of total) and 588 cancer cases (12% of total).

Digital health: The London AHSC/Ns are also partners in DigitalHealth.London, alongside MedCity and NHS England. It aims to accelerate the adoption of digital innovations across health and care to improve patient and population outcomes.

Overview of any significant developments associated with the leadership, strategy and governance arrangements which might impact on the delivery of the aims and objectives of your AHSC:

Whilst there is no anticipated impact to the delivery of the objectives of the AHSC, Professor Steffen Petersen replaced Professor Mark Caulfield as the Director of the Cardiovascular AMC in 2016. In addition, Professor Sir David Fish retired from the role of UCLPartners Managing Director in September 2016. Dr Charlie Davie, Managing Director of UCLPartners Academic Health Science Network, assumed the responsibilities of Interim UCLPartners Managing Director prior to the appointment of a permanent replacement later in 2017.

This form must be submitted, by e-mail, no later than **1pm Wednesday 31 May 2017** to Dr Joanna Topping (Joanna.topping@nihr.ac.uk). Please feel free to provide any other information you wish (in a separate annex) that demonstrates the progress made with your AHSC in 2016/17.

The Annual Report aims to capture progress against the stated objectives, specific themes and work programmes as set out in your application, in order for the Department of Health to be able to understand the overall progress of the AHSCs. However, please note that we will not be providing feedback on the AHSC Annual Reports.

A signed copy of this report should be sent no later than **7 June 2017**, to:

Dr Joanna Topping
NIHR Central Commissioning Facility
Grange House
15 Church Street
Twickenham TW1 3NL