

Vision (2016-2021)

The mission of UCL Institute for Women's Health (IfWH) is to bring together the expertise of clinicians and researchers from a diverse range of disciplines so that they can together deliver excellence and innovation in research, clinical practice, education and training in order to make a real and sustainable difference to women's health locally, nationally and worldwide.

The academic strategy of IfWH is focused on the four departments of the Institute: Maternal and Fetal Health, Neonatology, Women's Cancer and Reproductive Health, with a cross-cutting theme of Global Health. We submitted an application for a Gold Athena SWAN award on November 30th (see below).

The Institute for Women's Health is already the leading centre for Women's Health research in the UK. The vision over the next five years builds on this platform, and requires a transformative expansion of research and teaching capacity to firmly establish the Institute as one of the world's leading centres for women's health. The scope of this aspiration will, to an extent, be constrained by the ability to appoint a new director and the existing estate. There continues to be an urgent need to bring the components of the Institute together on one site to allow growth in the context of excellent laboratory, research and teaching space.

A key aspect of the academic vision is openness and transparency. And to this end since September 2016 we have started senior staff meetings where everyone, lecturer and above is invited, most issues are discussed and solutions are sought.

Specific aspects of the academic vision are:

Maternal and Fetal medicine:

- to understand the pathophysiology of gestational syndromes such as fetal growth restriction, pre-eclampsia and preterm birth, including their epigenetic mechanisms;
- to assess the safety and efficacy of novel therapies, to prevent and to treat gestational syndromes (e.g. statins to prevent pre-eclampsia, gene therapy to prevent preterm birth and to treat fetal growth restriction);
- to assess the safety and efficacy of stem cell treatments for severe single gene disorders such as lysosomal storage diseases and osteogenesis imperfecta (brittle bone disease);
- to develop innovative obstetric and fetal surgery in collaboration with UCL Centre for Medical Image Computing and within the new Wellcome Trust/EPSRC Centre for Surgical and Interventional Sciences; to be the first clinical centre in the UK to offer open fetal surgery for congenital spina bifida, with a view to developing less invasive laparoscopic techniques;
- to develop new therapeutic strategies to better neuroprotect the term infant perinatal brain;
- to use vector delivery methods to create a powerful tool for monitoring gene promoter activation in response to disease pathogenesis in living animals over their life time;
- to understand and harness the potential of fetal stem cells to treat perinatal disease
- to improve the conduct of therapeutic trials in pregnancy by multidisciplinary systematic development of the first set of criteria for maternal and fetal adverse events;
- to train outstanding scientists and clinical academics to develop novel prenatal therapies.

Neonatology:

- to assess safety and efficacy of stem cell rescue therapy in the neonatal encephalopathy model; to progress our translational neuroprotection research from the laboratory into phase II clinical trials
- to increase the critical mass of senior researchers in neonatology to extend our existing world-class research to cover additional key areas in contemporary neonatology, including work which understands and prevents lung inflammation, which will lead to clinical trials of ventilation strategies in preterm babies; cell-based therapeutic trials and sophisticated brain imaging techniques in collaboration with the UCL Centre for Medical Image Computing to understand how the preterm brain develops with the aim of developing interventions to improve neurocognitive development
- to lead pioneering translational research in adopting novel optical technologies and advanced computational methodologies for cot-side neuromonitoring to assess perinatal brain injury in newborn infants.

Reproductive health (RH):

RH brings together six teams working on the clinical, scientific, global and ethical issues related to gynecological function and development, sexual and reproductive health, the ovary, embryology, IVF and reproductive genetics, preimplantation genetics and diagnosis and early placental disorders. This includes research into disorders of sexual development, complex genital anomalies, paediatric and adolescent gynaecology, development of new techniques for the treatment of urogynaecology, pregnancy prevention, planning and preparation in the UK and Africa, microarray analysis to identify the subset of PCOS women at greatest risk of developing endometrial cancer, mechanisms responsible for the viscoelastic and endothelial abnormalities in patient with PCOS, reproductive outcomes in women with congenital adrenal hyperplasia, ovarian tissue cryopreservation, patients views on social egg freezing, ethical and religious issues surrounding current and future fertility treatment, fertility awareness in different communities, issues surrounding personal genetic testing including expanded carrier screening, preimplantation genetic diagnosis and non-invasive prenatal diagnosis, how genetic testing affects the use of donor gametes, adjuncts used in IVF, analysis of genetic profiles of potential parents and their embryos to relate this to the development of the embryos and their chances of implanting leading to a sustained pregnancy, CRISPR/Cas 9 to examine various aspects of infertility, pathology of recurrent miscarriage, diagnosis and management of early pregnancy complications, pelvic pain and endometriosis, pelvic adhesions and abnormalities of pelvic circulations.

To bring together more closely the academic and clinical departments at UCL and UCLH working on reproductive health, the Centre for Human Reproduction is being established.

Women Cancer:

- to undertake the highest quality research leading to advances in understanding the mechanism of development of women's cancer
- to develop methods for risk prediction, prevention and early detection of women's cancers
- to improve quality of life in women living with these cancers
- to recruit, educate and train outstanding scientists and clinical academics who will take forward our mission globally
- to drive clinical implementation of research findings through policy making, public awareness and linking with other centres nationally and internationally; to establish a working environment in which the entire multidisciplinary team deliver the highest levels of mutual support, respect and trust both internally and in external interactions.

Our vision aligns with UCL 2034, being founded around intellectual excellence which integrates research and education, addresses national and global challenges, and which involves our academic and NHS

partners in London and more widely to fully realise the potential of our contribution to improving women's health.

Achievements (2015/2016)

Education:

An iBSc in Women's Health started in September 2016 and immediately over recruited (13 versus 10).

The ongoing MSc programmes continued to recruit over forecasted target.

Two new distance learning CPD modules opened in 2016.

An annual five day Research Methods in Women's Health course was launched in May 2015.

An MRes in Reproductive Science and Women's Health will start in September 2017.

Dr Anne Lanceley started as Director of the new sub-brand Health and Medical Sciences MSc in Cancer Care Innovation which has a number of UCLH Cancer Fund bursary places.

We successfully launched a UCL Centre for Ethics in Women's Health.

Research:

Maternal and Fetal medicine:

Anna David took over as HoRD in 2016. She was promoted to Professor in October 2016.

Prof Jan Deprest, a leading international fetal surgeon from Katholieke Universiteit Leuven, Belgium has begun a 5 year secondment for two days a week at our new multidisciplinary Centre for Prenatal Therapy. This was funded by grants from GOSH Children's Charity (£300,000) and UCLH Charities (£155,000), and with salary support from UCL IfWH and Centre for Medical Image Computing. The team have trained to perform tracheal occlusion to treat congenital diaphragmatic hernia and have joined the international TOTAL FETO trial to evaluate its effectiveness. A multidisciplinary team from IfWH and Institute of Child Health have approval from UCLH to develop *in utero* repair of spina bifida, first by open surgery, the only centre in the UK to provide this clinical service. A postdoctoral student is evaluating cost-effectiveness and care quality. Collaborative research with UCL Bioengineering on the GIFT Surg Wellcome/EPSRC funded project has successfully developed flexible fetoscopes that will lead to the evaluation and implementation of minimally-invasive techniques to repair spina bifida *in utero*.

Senior staff in Maternal Fetal Medicine played an important role in the recent funding by Wellcome Trust/EPSRC for a Centre for Surgical and Interventional Sciences (Deprest and David co-applicants, David member of final interview panel) which will cement UCL as an international hub for innovation in obstetric and fetal surgery.

Another success for the Prenatal Cell and Gene Therapy Group is the award of a Horizon 2020 application of £4.8m, with Anna David as the UCL partner lead, for *in utero* stem cell transplantation for osteogenesis imperfecta (brittle bone disease). The EVERREST FP7 consortium led by Anna David that is translating a maternal VEGF gene therapy treatment of severe fetal growth restriction into the clinic has

demonstrated safety in the definitive reproductive toxicology study and is poised to apply for ethical approval in Q1 2017.

The Maternal Medicine group (David Williams) have been funded to investigate whether parental obesity (MRC: £890,000; Rosetrees Trust £60,000) and hypoxia (Wellcome Trust £90,000) alters epigenetic marks and how they may influence fetal growth. They have demonstrated the importance of maternal immune responses on vascular tone in pre-eclampsia (Wellbeing of Women; UCL Impact studentship and Industry partners) and successfully completed a study evaluating the effect of statins in pre-eclampsia (MRC funded STaMP trial).

The Gene Transfer Technology group (Waddington, Buckley) have set up four successfully funded gene therapy collaborations: (1) with Dr Ahad Rahim, Professor Fran Platt (Oxford) in an MRC funded project grant for Niemann Pick C; (2) with Professors Paul Gissen, Adrian Thrasher and Dr Julien Baruteau (ICH) and Professor Ian Alexander (Children's Medical Research Institute, Sydney, Australia) in an MRC funded Developmental Pathway Funding Scheme (DPFS) for gene therapy for ornithine transcarbamylase deficiency; (3) with Professors Ross Breckenridge and Ian Zachary at UCL funded by BHF; and with Professors Nick Greene and Andy Copp, ICH, UCL funded by Action Medical Research for Non-ketotic hyperglycemia.

The Cellular Reprogramming and Perinatal Therapy Group (Guillot) have isolated and characterised two subsets of fetal stem cells in human mid-trimester amniotic fluid, and demonstrated that they possess different therapeutic potential for perinatal bone and brain disease.

In the Preterm Labour Group, Dr Natalie Suff, a PhD student on a Wellbeing Research Training Fellowship, (supervisors Peebles and Waddington) has recently shown sustained expression of a human antimicrobial protein (beta defensin 3, HBD3) in the cervico-vaginal epithelium of mice following gene transfer using an Adeno-associated viral (AAV) vector. Further, overexpression of HBD3 prevents bacterial ascent from the vagina into the uterine cavity of pregnant mice. The team is now working to commercialise this intervention as a potential therapy to prevent ascending infection related preterm birth (approx. 50% of all preterm deliveries).

Neonatology:

Prof Boris Kramer, a leading neonatologist from University of Maastricht, who has world class expertise in inflammation started his 2 year part-time secondment at UCL in February 2016. He and Nikki Robertson are working together on FDA approved stem cell therapies in their pre-clinical models with the aim to translate to clinical therapies for neuroprotection. Prof Kramer also aims to lead clinical trials of ventilation and cell-based therapies strategies in preterm babies. The collaboration with Chiesi is progressing well with the transfer of the Orphan Drug sponsorship from Prof Nikki Robertson to Chiesi in October 2015. Results will be available in March 2016 which will determine the next step to clinical trials for the new Chiesi melatonin formulation.

Alongside the preclinical work world class neuroscience research will elucidate important mechanisms of brain development which underpin the cognitive and psychiatric challenges faced by preterm children in early childhood and adult life, combining state of the art computational psychometrics and MR imaging modalities with clinical studies. Neil Marlow will lead international groups in working with Pharma to develop efficient outcome evaluations to support neonatal trials.

Working together with the multimodal spectroscopy group in biomedical physics and engineering in UCL, Subhabrata Mitra and Prof Nikki Robertson are investigating a novel optical technique for cot side assessment of brain injury following neonatal encephalopathy in preclinical model and in babies.

Reproductive Health:

Professor Joyce Harper took over as HoRD in 2016.

The Sexual & Reproductive Health Research Group (led by Judith Stephenson) is now recognised as an international leader for research into pregnancy planning and the pre-pregnancy period; the impact of our published research is reflected in consultancies, a chapter in the CMO's annual report (2015) on preconception care, membership of an NIHR Dissemination Centre expert group on 'Health before, during and after pregnancy'; an invitation to lead a Rank Prize funded-three-day symposium on this topic; and invited contributions to WHO and UNFPA high level strategy meetings and official declarations. We have established a track record in e-health research through evaluating a pre-conception interactive m-health intervention in East London and by developing a new website to improve informed choice of contraception (NIHR HTA-funded study), which we are now starting to adapt for use in southern Africa with funding from the Farha PhD fellowship. Chelsea Moronni was promoted to Senior Lecturer in 2016 and has set up a thriving research partnership in Botswana around four themes: pregnancy intention/planning; contraception in the context of HIV; abortion and sexually transmitted infections. Dr Jenny Hall has been shortlisted for a clinical research career development Wellcome Trust fellowship and is applying for an NIHR post-doctoral fellowship to further investigate pregnancy intention and to introduce a validated measure of planned pregnancy into NHS maternity settings for the benefit of patients and populations.

The Early Pregnancy Unit and the associated basic science research is recognized as a leading international center in this field. We are also leaders in the diagnosis and management of complex early pregnancy complications which is supported by a 900,000£ NIHR grant. The main objective of this research program is to assess the quality of diagnosis and management of early pregnancy complications and develop cost-effective models for care at the national level. Davor Jurkovic is also a successful co-applicant on several NIHR funded portfolio studies into clinical early pregnancy research; PRISM, GEM3 and Mife-Miso.

Sioban SenGupta was promoted to senior lecturer in 2016. Joyce Harper was appointed to the Nuffield Council of Bioethics working group on Genome Editing and as an advisor on IVF culture media to the MHRA. Joyce Harper is deputy chair of the Fertility Education Initiative aiming to bring fertility awareness into the UK curriculum. Joyce Harper has lead the third meeting of the European Society of Human Reproduction and Embryology (ESHRE) and the European Society of Human Genetics; Recent developments in reproduction and genetics: from research to clinical application and been part of the ESHRE culture media working group who published two papers in 2016.

Sarah Creighton was appointed chair of specialist services commissioning for NHS England for Women's Health, Obstetrics and Gynaecology and has obtained a grant to study clitoral reconstruction surgery on women who have had female genital mutilation. Gerry Conway (PI) and Sarah Creighton have an IFCAH (International Fund for Congenital Adrenal Hyperplasia) grant to look at reproductive outcomes in women with Congenital Adrenal Hyperplasia. The grant is for multicentre study and will provide the first UK pregnancy outcomes.

Paul Hardiman leads the Ovary and Sex Steroid (OSS) Research group. He received a grant from the Royal Free Charity for a study to develop new techniques survival of cryopreserved ovarian autografts. A member of his team was awarded first prize at the Oncofertility Consortium in 2015 and has been invited

to a meetings announced at the White House, hosted by The Organ Preservation Alliance held at NASA Research Park, California in 2016 and Harvard in 2017. The ovarian cryopreservation project is being carried out in collaboration with Imperial College and Cologne University. The other major area of research focuses on the health and behaviour of babies born to mothers with polycystic ovary syndrome (PCOS). With grants from the Royal Free Charity and Jean Ginsburg Foundation, a unique cohort of mother baby dyads have been recruited. These babies with controls, are being followed up to study the impact of maternal PCOS on anthropomorphic, endocrine, metabolic and behavioural outcomes. This work is being performed in collaboration with the Cambridge and Berne Universities. The research Group has also developed joint teaching and research projects with the School of Medicine, Zhejiang University in China. Paul was invited to visit Zhejiang in 2016 to deliver a lecture to scientists and clinicians. Zhejiang University has funded a scholarship for a postdoctoral student to work with the OSS team for one year.

Women's Cancer:

UKCTOCS investigators and the research team presented the primary analysis of mortality impact from the world's largest ovarian cancer (OC) screening trial in The Lancet. The successful completion of the trial was highly commended in the accompanying Lancet editorial.

Several additional high profile (IF 10+) papers (i.e. two in Nature Comms, one in Genome Biol) have been published as lead authors by the team.

The Eve Appeal BRCA PROTECT Research Clinic was launched early 2016 and its remit is to invite BRCA carriers, women with Lynch Syndrome and control women to donate biosamples to develop novel predictive and preventive measures.

A sub-study of the Horizon 2020 FORECEE (Female cancer predictiOn using ceRvical cEll omiCs to individualise prEvEntion) programme featured in the BBC programme 'Trust Me I'm a Doctor' which was broadcast on BBC2 at 8pm on Thursday 22 September.

The group published benchmarking standards for comparison of surgical outcomes in gynaecological oncology surgery in UK.

We have secured the following grants:

£620,000 from The Eve Appeal to fund the new the Computational Biology Group in the UCL Department of Women's Cancer which will be headed by Dr Andrew Teschendorff.

£995,000 from NIHR HTA for follow up of the UKCTOCS participants.

We are collaborators on various large programmes including a US NIH Program Grant and a HORIZON 2020-MSCA-ITN There have also been awards from Pancreatic Cancer UK, Pancreatic Cancer Action, the Rosetrees Trust for biomarker development work, and Macmillan Cancer Support.

In addition we have been made a UCL Knowledge Exchange Champion in the process of setting up the company known as "tagCandMe".

Strategic Goals for Planning Cycle 2016 to 2021

Academic Strategy

Teaching

Our Institute continues to excel in education as reflected by the student barometer and overall student experience. Our MSc programmes have been running for 20 years. Recruitment continues to be healthy without marketing but we intend to develop marketing over the next five years.

We have developed an MRes programme to allow greater laboratory time to those who wish to undertake an in-depth project.

The iBSc has four set modules and no optional modules to ensure adequate student numbers in the first few years. We hope that students taking other iBSc may enrol on our modules but we would also propose development of a BSc programme in Women and Child Health (jointly between ICH and IfWH). It is envisaged that the BSc students may take the iBSc modules. In the long term, as student numbers increase on the four iBSc modules, we can introduce an optional module programme into the iBSc.

We are developing our life long learning. As well as several face to face workshops and two CPD programmes, our first MOOC was launched in 2016. We aim to complement these courses with further distance learning and life learning courses.

We will continue to improve our student experience. We take into account the student experience before arriving at UCL, whilst at UCL and when they leave. We have implemented the use of socratic for student feedback and questionnaires during face to face feedback and tutorials. This has been really well received by the students. We continue to listen and discuss with students and act on their suggestions.

We continue to deliver one of the most comprehensive careers and employability programmes in UCL over six afternoons. Numerous alumni help with the delivery of these sessions and the feedback continues to be very positive. Our employability page on the Institute web site has recently been update with a selection of short videos from alumni. The aim of all our education strategy is to cover global issues, ethics, new technology, research methods and clinical application.

We would like to expand our NIHR academic clinical trainee programme by creating matched lecturer posts and also increase the success rates of grants applications for doctoral research.

As part of research into communication between doctors and parents on the neonatal unit we are developing and hope to trial in 2017 a novel training package to improve mutual understanding and parent choice in making difficult decisions about their child. This will form an important cornerstone for teaching professional communication practice.

Research

All research departments are achieving excellence but there is a serious issue with loss of research staff overall (see below) and succession planning in all departments. When we received our Athena SWAN Silver award in 2013, we had 106 staff, including academic, research and PSS. We are now down to 78 staff (see Athena SWAN Gold award application, November 2016). Despite this 25% loss of staff, we have an above average success rate for external grant application (46% 2014/15 and 42% so far 2015/16). **Nonetheless, there are serious issues of sustainability for the Institute as a whole.** Most research staff are working long hours to sustain research productivity as well as supporting new teaching course such as iBSc and increased student numbers. There is therefore limited possibility of the Institute increasing its research activity unless there is strategic investment in Lecturers/Senior Lecturers in the Institute by UCL,

Maternal and fetal medicine: Goals for 2017 include:

- identifying angiogenic factors and new proteins through proteomic analysis to predict fetal and neonatal outcome at diagnosis of severe early onset fetal growth restriction;
- obtaining ethical approval to start a first-in-woman trial of a novel maternal gene therapy for severe fetal growth restriction using adenovirus VEGF vector;
- securing a patent for preterm labour therapy; and complete proof of principle studies to determine whether AAV vector delivery of an antimicrobial peptide to the cervical epithelium can prevent ascending infection related preterm birth in pregnant mice.
- attaining ethical and regulatory approval to conduct a clinical trial of stem cell transplantation to treat osteogenesis imperfecta;
- securing grant funding to assess the pre-clinical effectiveness of gene and stem cell therapy for congenital neurological disease and perinatal brain injury in particular research council, EC and Wellcome Trust funding;
- establishing UCL/UCLH as the first UK centre to offer open fetal surgery for repair of spina bifida *in utero*;
- recruitment of a Senior Lecturer in Obstetric Surgery and Labour Ward practice to develop clinical trials in this important and under-researched area of obstetrics; such an appointment would play a key role in the recently funded Wellcome Trust / EPSRC Centre for Surgical and Interventional Sciences at UCL where obstetric surgery is one of the surgical themes.
- There are plans for further investment in laboratory equipment at the Centre for Prenatal Therapy, creating a Fetal Stem Cell Lab, and Women's Cancer, but we are constrained by finance and space.

Neonatology: Goals for 2017 are:

Preclinical Neuroprotection Studies (NR)

- To assess efficacy of an optimised dosing schedule of melatonin for augmenting hypothermic brain protection based on prior PK data
- To work with the regulatory bodies (EMA and Air Liquides) to obtain authorisation to start a phase I clinical safety study of Argon delivery in babies with NE undergoing cooling. This is likely to lead to phase IIa and b studies if safe.
- To validate the role of microRNA and other blood markers in assessing inflammatory status in hypoxic injury
- To assess stem cell therapy in the piglet (pilot work for grant)
- To develop the collaboration with University of Cambridge (Prof D Rowitch) and UCSF on neuronal arc migration at term in the sheep and piglet models – do they resemble the human neonate?
- To obtain funding for combination therapy with early cooling and melatonin and late Epo in the piglet asphyxia model
- To complete the project assessing whether magnesium augmented cooling improves outcome compared to cooling alone

Preclinical Neuroprotection Studies (BK)

- Models of bronchopulmonary dysplasia to study ventilation and pharmaceutical therapies for the prevention of lung inflammation

- To develop the collaboration with University of Cambridge (Prof D Rowitch) and UCSF on neuronal arc migration at term in the sheep and piglet models – do they resemble the human neonate?
- Develop preparation of extracellular microvesicles (exosomes) as an alternative for neuroprotection in preterm brain injury after hypoxia-ischemia

Global Health (NR)

- To establish and develop a collaboration with Dr Cristabel Enweronu-Laryea <chikalaryea@gmail.com>, University of Ghana, Accra and assess the body temperature in relation to outcome in asphyxiated babies with a view to standardising a simple protocol of optimal low tech care for such babies.
- To develop the smart App for assessing bilirubin levels in babies in Ghana - collaboration with UCL Medical physics (Dr Terence Leung)

Clinical Neuroimaging Biomarker studies (NR, NM, SM)

- To publish data on the last 5 years 3T versus outcomes for high risk term and preterm babies
- Continue collaborations with CMIC.

Near infrared spectroscopy (SM, NR)

- To publish data on the relationship between cerebral metabolic autoregulation and outcome following perinatal hypoxic ischaemic brain injury
- To publish data on changes in cerebral oxidative metabolism in relation to electrical changes during neonatal seizures
- To publish the relationship between cerebral cytochrome-c-oxidase and oxygenation as an indicator of injury severity following perinatal asphyxia
- To assess cerebral metabolism in relation to development of brain injury in preterm infants early in life
- To investigate the complexity and variability in systemic and near infrared signals following perinatal brain injury in relation to outcome

Outcomes (NM)

- To complete the analysis and write up of young adult outcomes following extremely preterm birth in EPICure
- To set up and start EPICure2@11 study of 11 year old extremely preterm survivors (MRC Programme Grant)
- To develop collaborative research between major European preterm studies and as part of the Adult born Preterm International Collaboration
- To support national perinatal and neonatal randomised trials.

Reproductive Health: Goals for 2017:

Our strategy is to be recognized for world class research in reproductive health. Setting up strong collaborations, such as through the Centre for Human Reproduction will help move research forward.

Our research goals include:

Ovarian cryopreservation, IVF and Reproductive Genetics

- A national wide study into social egg freezing in collaboration with De Montford University. Women freezing their eggs will be invited to complete a survey.
- To determine if parental genetic profiles of specific genes can be predictive of embryonic genome integrity prior to implantation.
- Use of CRISPR/Cas gene editing for the HDR-mediated correction of sex chromosome mutations
- Use of gene editing to establish an algorithm for time-dependent prediction of mosaicism in CRISPR edited embryos
- Exploit CRISPR/Cas9 technology to correct duplications and restore dystrophin expression by using a single gene therapy construct.
- Investigations into unproven adjunct treatments in IVF
- Applying for a PhD studentship to examine why forced marriage causes detriments to mental health and wellbeing for UK-based South Asian women.

Gynaecology Research

- Successful conclusion of the NIHR VESPA study.
- Developing new clinical and basic science protocol on the pathophysiology on the effect of uterine scarring on implantation and placentation.

Pregnancy prevention, planning and preparation

- to complete a Lancet series of papers on preconception care, as agreed with Lancet editors
- to complete a James Lind Alliance Priority Setting Partnership in Contraceptive Care and publish the top 10 priorities in high impact journal and feed into next round of NIHR commissioned research calls
- to pilot the implementation of a validated measure of unplanned pregnancy (LMUP) in maternity service at UCLH
- to validate a new measure of future pregnancy intention with non-pregnant women
- to complete a pilot study of a preconception 'buddy' intervention with women planning a pregnancy in a general practice setting in East London
- to complete recruitment to an NIHR funded cluster randomised trial of bridging from community pharmacy to SRH service for women seeking emergency hormonal contraception from local pharmacies (Bridge-It, PI Edinburgh)
- to appoint a clinical lecturer to lead work on pregnancy planning and pathways to improve pregnancy / birth outcomes
- to advance our programme of global reproductive health in Botswana
- to complete PhD on fertility awareness among population groups and professionals

Women's cancer: Goals for 2017:

To maintain and expand our productivity we need to:

- Appoint a pathologist, in order to understand disease development it is vital that we have a dedicated pathologist. Ideally this could be a joint post between the Department of Pathology and the DoWC; 0.5 FTE for this post had now been secured from the BRC.
- Appoint an experimental Epigeneticist/Geneticist: A weakness that currently exists in our Department is that we have no dedicated senior functional geneticist/epigeneticist. Our discovery work is largely done in humans; the lack of demonstrating functional relevance prevents our work from having higher impact.
- Appoint a non clinical lecturer to ensure succession planning and continued use of the rich data and samples collected in the course of the UKCTOCS/UKFOCSS/UKOPS trials.

- Start a UKCTOCS PhD programme so that the vast amount of data collected in the course of the trial can contribute to both research and education
- To secure funding for maintenance of the trial biobanks beyond 2017.
- Expand on a dedicated research clinic that allows us to offer prevention trials.
- Build up a computational biology group.
- Develop a core facility for collaborative proteomics: whilst there has been a high level of collaborative work using the existing platform with tangible output, its age precludes generation of state-of-the-art data which limits its potential. Equipment replacement funding from the BRC is being sought but central strategic support is required.
- Validate our early detection biomarker panels in ovarian and pancreatic cancer and translate these into more rapid diagnostic pathways.

This year we have submitted several major grants (i.e. to NIHR, ERC Advanced Grant, EC-FTI, H2020 stage 1, PCUK Grand Challenge) and others are planned (CRUK, MRC, Breast Cancer Now, Marie Curie). We expect that a mixture of potential funding sources i.e. The Eve Appeal Charity, the formation of the spin-out company tagCandMe (see page 6), Consultancy-activity of the HoD, income /consultancy from UCL's spin-out Abcodia (see Enterprise below) and core funding will be able to generate sufficient funding.

Overall issues

The Institute's research facilities i.e. the wet laboratories and the imaging laboratory are not of a standard expected for the quality of research taking place and the vision for the Institute. The location of the Institute's facilities is far from helpful being widely distributed around the campus. For example, the Cellular Reprogramming and Perinatal Therapy Group (Guillot) currently uses laboratory space with Professor Paolo de Coppi's lab at Institute of Child Health, but the group will need to move back to IfWH when the Zayed Centre for Research into Rare Disease in Children opens in 2017.

Enterprise and Knowledge Transfer (Impact)

Enterprise

We will continue to explore engagement with industry to develop therapies for use in women's health.

A major advance in prenatal therapy will be through the development of the first criteria for maternal and fetal adverse events in clinical trials, led by Anna David through the EVERREST consortium. The Medical Dictionary for Regulatory Affairs, MedDRA adopted all the proposed new terms (12 maternal, 18 fetal) in March 2016, and a Delphi process in 2017 will be aiming to get international agreement on grading these terms.

Simon Waddington's group within MFM have set up a research collaboration with Touchlight Genetics:

<http://www.touchlight.com/news/2016/february/ucl-collaboration-dbdna%E2%84%A2-for-gene-therapy>

to make vectors using their enzymatic DNA amplification technology

Usha Menon continues to work with the UCL spin out Abcodia <http://www.abcodia.com/>

to expand industrial/academic collaborations focussed on early detection and risk markers of cancer.

We are also interested in engaging with industry in those areas in which pharma has been reluctant to develop new therapies, specifically in pregnancy and the newborn. The major areas where new pharmaceuticals would be of value are in preterm birth prevention and pre-eclampsia prevention and treatment. This work will be facilitated by close collaboration with the School of Pharmacy.

Working with the International Neonatal Collaboration (Critical Path Institute) we are developing common strategies for neonatal trials in collaboration with the regulatory agencies (FDA, EMA) and a range of Pharma to ease the introduction of new neonatal therapies

We will continue to encourage participation of academic staff in consultancy activities, by registering with UCL Consultants.

International Activities and Partnerships

Our strategy is in line with UCL 2034 goals and the current priorities set up by the Council. It includes working closely with the UCL Institute for Global Health to develop new projects in Africa while continuing to grow existing Type I relationships in the continent led by Judith Stephenson and Nikki Roberts. The focus for all the work is in areas where the Institute has specific expertise that is key to addressing issues of effective and sustainable interventions in the health services of middle and low-resource countries to improve women's health.

The Women's cancer group is working with India - Usha Menon continues to work with the cancer hospital of the TATA group, TMC, Kolkata <http://www.tmckolkata.com/> to support cancer biobanking and building research capability, Martin Widschwendter has recently received GEO funds for a new initiative with Delhi University.

In education, Anna David has also received a GEO grant to work with colleagues in Paris Descartes University to develop an exchange programme for medical students and trainees in addition to expanding research collaborations in prenatal therapy.

All teams in addition will continue to be part of various international research collaborations.

Enabling Delivery of the Academic Strategy

Finance and KPIs

In order to increase our % central contributions we set out to increase the teaching contribution of the existing research staff whose core focus is delivering highest quality research. They have responded to the need by stepping up and stretching. Many have taken on key roles in the new iBSc which is a reflection of their commitment to the success of the IfWH. The increase in students and introduction of a new course has been alongside a 25% shrinkage in number of staff. It would however not be possible to

continuously increase student numbers without recruitment of new staff given that nearly everyone is working well beyond their contracted hours.

For the major activities outlined in our submission last year i.e. the Centre for Prenatal Therapy, we have secured external funding. In addition with the succession planning in Neonatology, we have negotiated a secondment which is funded by RCF funding and a donation from the EGA Hospital Trustees, so no additional burden is placed on core funds.

Since appointment as interim Directors we have proactively worked with individual PIs to identify opportunities to increase grant income and application for fellowships.

Estates and Space Management

Our laboratories are based in Chenies Mews, PoG building, Queen Square, the Cruciform building. There is further use of laboratories from other Institutes by a number of groups at Rayne Building and 30 Guilford Street, Institute of Child Health because of a lack of space and/or equipment. Equipment is shared where possible, however as there is currently no IfWH Laboratory Manager, the management of laboratory issues has devolved to the various Group Leads. This has led to poorly coordinated laboratory space and concerns about lab safety. The lack of common laboratory space results in the inability to purchase key equipment. For example, there is currently no autoclave at Chenies Mews which hampers gene therapy work. It is not cost effective to purchase this equipment for so few users; this would change if all IfWH staff were in one building. Furthermore, office space is spread even further afield.

The Institute continues to struggle with a difficult estates situation. For a relatively modest sized Institute we occupy nine different locations, with no opportunity for informal interactions across the different research departments (and even within departments). The number of staff in the Institute has shrunk, so there is no urgent need for additional space. We do, however, continue to need common space which is fit for purpose.

Philanthropy and Alumni

We are actively compiling vignettes of projects for philanthropic fundraising, from small projects (e.g. studentships) through to large initiatives (e.g. Research Centres). We have had preliminary discussion with DARO and successfully sourced funding from the Mitchell Family Trust to support a new study in stillbirth. Women's Cancer continues to work closely with and receives significant funding from the Eve Appeal.

We continue to have an active alumni Facebook page, and we invite alumni to an annual networking event. We have prepared material for fund-raising from our alumni (initially to raise funds for our education activities) and this was launched in early 2016. We are preparing a video celebrating 20 years of our MSc programmes.

People

We applied for an Athena SWAN Gold award in November 2016. We achieved gender balance at senior levels i.e. 50% women at senior lecturership and above, including professorial level. Other features:

1. A unique institute with a breadth and depth of expertise that allows us to address both the severe effects of gender inequality (e.g. female genital mutilation) and the more subtle effects (e.g. everyday sexism) that affect women's health and wellbeing.

2. Successful action to promote female staff into senior academic positions, with highly visible role models

3. A culture of highly flexible working enjoyed by female and male staff at all grades, including job-sharing at Director level.

4. Outstanding support for students and trainees including a comprehensive careers programme and long-term, close ties with our alumni.

5. Striking range of Beacon and Outreach activities with impact far beyond the institute and UCL.

We will implement a new workload allocation template in all academic appraisals from February 2017 and move all annual appraisals to February to increase completion rates, assist HR procedures and stimulate discussion of Institute-wide issues amongst staff.

Training and development needs including leadership development: We continue to encourage staff via appraisals and staff forums to take up training and target and support those who are eligible for leadership programmes, ensuring funds are available for relevant courses. This year, 3 senior staff in cancer and MFM are undertaking leadership courses through SLMS or the Aurora Programme.

We have reviewed our succession plans and one of the seconded posts is a direct response to this, however core funds are not available. We have previously reviewed all staff with respect to ERVS and retirement and the Faculty is aware of our current situation.

We see no major changes within the total complement of staff within the Institute over the coming year. However, we do need to substantially increase our academic staff numbers in the longer term. Despite the desire of UCL to minimise growth in the number of academic staff, this is an unsustainable situation in the Institute. The research departments run with one or two PIs bringing in research monies. The future of these departments, and the entire Institute, relies on growth in the academic staff numbers if it is to survive.

We will continue to encourage active participation of all Institute staff members in the annual UCL staff and internal IfWH staff surveys, and use the findings from the surveys to develop actions to improve the working environment of the Institute.

UCL Professional Services (Support Functions)

Opportunities for creating more effective, responsive and efficient support services

We have a core PSS team comprising HR, Finance and Research and Education. The Executive Assistant to the Directors and PAs to Heads of Departments and senior staff are funded mostly on soft monies. The teams are performing well and although staff numbers have fallen the Finance and Research team have seen an increase in workload and for the period 2015-2016 applications rose threefold. It is to be noted that some research and commercial negotiations are very complex and challenging for the team. Our teaching administrators support over 40 MSc students, 40 PhD students as well as over 300 Year 5

medical students and this summer we employed a new 0.5 FTE administrator to support the new iBSc programme which exceeded its forecasted numbers. However there has been a longstanding HR issue which has impacted on the service given to the Institute and the challenges it has created for the Institute manager but this is now being resolved.

For the coming year we are continuing to support career advancement for the support staff by improving induction for staff, enhancing career development to include organising shadowing opportunities across UCL and working towards standardising job descriptions. We will also work with the Faculty and UCL O&D to develop a career development pathway. These actions were included in our Athena Swan Gold application and will require support from senior staff and Faculty. We hope that this effort will result in professional services staff feeling more valued and equipped to take on higher level roles not just within the Institute but the wider UCL, addressing one of the key enablers of the 2034 vision to value and develop staff.

At this stage staff are becoming aware of the transforming our professional services programme taking place and it is unclear what impact this will have for our teams. We are currently organising a presentation from the Project Manager to be scheduled for the New Year.

Risk Management

In addition to the risks and mitigation strategies set out in the School Risk Register, please list any additional major risks that are specific to divisions / institutes which need management.

Key risks and mitigating actions

A major risk within the Institute are that senior staff, who have been encouraged for years to develop new and exciting programme of research, become frustrated with the current UCL policy to remain static in size, while increasing their teaching workload. Some may leave, and given a real lack of high quality academics within women's health in the UK, this will be critically damaging to women's health research and education at UCL and nationally. The move of even one senior staff member from each research department away from UCL would result in the loss of a major research strength in women's health at the Institute. When compared to other comparable research centres in women's health (e.g. Manchester, King's, Edinburgh), the research departments within IfWH publish and attract funding from a far smaller staff number. It would therefore be important not to continually increase the teaching load.

Even more risky is the inability to support the careers of junior staff and expert technicians who deliver much of the hands-on research within IfWH and UCL. They are crucial to developing future scientists and clinical academics and training PhD and Masters students. This creates a serious loss of continuity of expertise, and cyclical demoralisation of existing staff as they see others leaving to alternative careers.

Finally the continuing need for Interim Directors with the failure to attract a new Director renders the future of the Institute uncertain, and makes attracting new staff very challenging.