

## EGA Institute for Women's Health Strategy from 2021 to 2027

### Summary

The mission of UCL Elizabeth Garrett Anderson Institute for Women's Health (IfWH) is better lives for women and babies across the world. We bring together the expertise of clinicians and researchers from a diverse range of disciplines to deliver excellence and innovation in research, clinical practice, education and training in order to make a real and sustainable difference to women's and babies health locally, nationally and worldwide.

The IfWH Strategy renewed in Q3 2018 for 4 years, 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 were successful in our renewal application for a Gold Athena Swan Award in May 2021, one of only a handful of academic departments in the UK to be thus acknowledged for excellence in Equality, Diversity and Inclusion (EDI). Our first Gold Award was in 2016.

IfWH is the leading centre for Women's Health research in the UK, taking a unique life-course approach. The vision over the next 1-5 years builds on this platform, ensuring succession of staff after the retirement of senior academics, develop our Early Career Research track including investment in nursing and midwifery research, and build better links with other Institutes within the Faculty of Population Health Sciences particularly in Global Health and Clinical Trials and Methodology.

Long term, IfWH requires a transformative consolidation of research, administrative, teaching and public space to truly deliver the Institute's potential as one of the world's leading centres for women's health. We have recently launched our fundraising Case for Support with support from the UCL Office of Vice Provost Advancement (OVPA).

1 year focus:

#### **Senior succession planning:**

1. Appoint a Professor of Gynaecological Oncology (50:50 clinical/academic) to regenerate the Department of Women's Cancer and lead investment and grant funding initiatives for research, scientific discovery, and translation in the speciality (business case approved Feb 2021).
2. Appoint a Professor/Associate Professor in Women's Cancer Science to capitalise on the legacy generated by the late John Timms and his Proteomics group (business case approved Feb 2021).
3. Secure a proleptic appointment for an Associate Professor in Neonatology (Hon Consultant at UCLH)
4. To appoint an Associate Professor in Reproductive Health to replace to replace upcoming retirement.
5. Working on a Fellowship application for a subspecialty trainee in Reproductive Medicine at UCLH, business case to be submitted Feb 2022.

#### **Funding:**

1. Successful application for IfWH to be part of the new Tommy's Charity Centre for Preterm Birth (application scheme launching Q2 2022). This would bring in £800k to the Institute, linking with 3-4 other UK institutions, strengthen our reputation and unique skills in pre-clinical & early phase pregnancy clinical trials in preterm birth & placental insufficiency, and neonatal outcome assessment.
2. Launch a midwifery fellowship scheme using the Annie McCall UCL Legacy. This will provide up to £50k for 2 rounds of one year fellowships to invest in development of midwifery clinical academics.
3. Build better links with ICTM and CCTU with regard to clinical trials in women's health, and research evidence synthesis to increase amount of funding coming to UCL and success in trial applications.

**Our five years strategic priority aims are listed under the relevant sections below.**

Due to the extraordinary year we have had in 2020 we did not have an Away Day to follow upon our 2019 focus points, but we plan a Strategy review and refresh in Q1 2022.

The main focus points for 2019 following the Away Day were:

- **Improve the communication of our strategic vision** to all Institute and UCLH Women’s Health staff, funders, the public and potential donors around which the IfWH can develop their fundraising initiative for consolidated space. We launched our Fundraising Case for Support with OVPA at our 2020 Extraordinary Meeting in December 2020.
- **Develop our Global Health research and education focus in women’s and newborn health** by linking with other Institutes within FPHS and externally (eg LSHTM) with a view to improving the health of women and their families in low-and middle income countries. Recent updates include the following:  
Education: We have developed teaching collaborations between IfWH and IGH including:
  - An IfWH staff member who co-leads the Global Maternal and Child Health module with an IGH staff member.
  - We have explored opening this module to the Women’s Health iBSc but as this course has no optional modules this has not yet been possible.
  - IfWH staff members are supporting teaching on IGH modules such as Gender and Health
  - There are a number of IfWH modules that are open to IGH students and vice versa.Research: We have regular meetings between IfWH and IGH to discuss research interests and consider joint grant applications.
  - Capacity for collaborative grant applications with LMIC institutions has not been possible during COVID but there is appetite to work together. The reduction in ODA funding is likely to reduce success rates. Work is ongoing to help mitigate effects. Team members from IfWH (Hall and Hillman) has been engaging with members from the UCL Research Services Team and funding bodies (Medical Research Council) to investigate potential strategies to secure funding.

Other international activities and partnerships will be outlined in the relevant section.

- **Enhance the postgraduate research structure for nursing and midwifery** by developing closer links with the UCLH Centre for Nursing and Midwifery Research (CNMAR). In October 2020, a CNMAR funded Lecturer in Midwifery based at UCLH and IfWH (Dr James Harris) was recruited to Chelsea & Westminster Hospital/Imperial College as a Senior Clinical Lecturer in Evidence Based Midwifery. Since then Rachel Taylor, Director, CNMAR, Honorary Associate Professor at IfWH has been supporting midwives and nurses to apply to the NIHR for Predoctoral Clinical Academic Fellowships as a route to successful PhD fellowship applications. We are currently investigating legacy funding to UCL IfWH to support a women’s health nursing and midwifery PhD program to push this agenda forward.

## Achievements from 2019

### Education:

We now run 4 MSc programmes and one MRES. An innovative new MSc in Obstetric Ultrasound has been set up by Dr Raffaele Napolitano, Consultant and Hon Associate Professor in Obstetrics in collaboration with UCLH and the first cohort of students started in September 2021.

Our IBSc programme currently has 30 students to include 5 external students, the programme started in 2016 with 13 students and had decreased to 8 students for the academic year 2018-19.

A UCL-led national training programme in bereavement care has been piloted and the first course is running at UCL in November 2021.

We run a MOOC (Making Babies in the 21<sup>st</sup> Century) which is available to the public as well as a student only version for our MSc students.

**Main achievement in Research** (*full summaries can be found in the appendices*)

### **Maternal and Fetal Medicine**

We have secured funding to research Extracellular Vesicles (EV) as a cell-free therapeutic and the use of genome editing for personalised medicine. This complements the gene and stem cell therapy programmes currently developing clinical trials for treatment of brittle bone disease and early onset fetal growth restriction. The MFM department works on the edge of discovery to develop innovative treatments to counteract gestational diabetes and prevent stillbirth (Dimitrios Siassakos, David Williams), preterm labour (Ashley Boyle, Donald Peebles, Anna David), placental and fetal cardiac dysfunction in obese women (Owen Vaughan), pre-eclampsia (Sara Hillman, David Williams), skeletal fragility (Pascale V Guillot), neonatal brain damage (Pascale V Guillot and Mariya Hristova), open and fetoscopic surgery for spina bifida (Anna David, Adalina Sacco), magnetic resonance imaging of the fetus and placenta (Roz Aughwane), Dravet syndrome (Rajvinder Karda), childhood inherited genetic diseases including Gaucher disease (Simon Waddington), acute fatty liver of pregnancy (David Williams), and bleeding disorders in women and neonates (Rezan Abdul-Kadur).

### **Reproductive Medicine**

The Sexual & Reproductive Health Research Group (led by Judith Stephenson) is recognised as an international leader for research into pregnancy planning and the pre-pregnancy period; the impact of our published research is reflected in a Lancet series of papers on Preconception Health (2018) followed by an invited Lancet paper (2019) presenting a potential annual report of the state of preconception health nationally. We continue to lead the field through work with PHE, health visitors, primary care and others.

We helped design and implement the CAP COVID study which has shown that women found it ten times harder to access contraception during the first lockdown (from late March 2020), resulting in at least a doubling of unplanned pregnancies.

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. She was also a key player in the development of the Human Fertilisation and Embryology web site on IVF add-ons and was a co-author of the consensus paper on add-ons. Joyce Harper is co-founder of the Fertility Education Initiative aiming to bring fertility awareness into the UK curriculum.

Helen O'Neill was awarded a UKRI Innovations Scholars Secondment award starting February 2021 for three years; project title: The Use of A Combined Clinical Symptom and Biomarker-Based Model to Predict Risk of Developing Reproductive Conditions and Fertility Potential. The vision of the project is to address two major challenges (1) the lack of access to reproductive testing and (2) the lack of diagnoses for common reproductive pathologies.

### **Women's Cancer**

In collaboration with research centres across Europe, Martin Widschwendter and his team collected more than 7000 cervical smear samples from women with and without cancer and analysed the epigenomes of epithelial cells within these samples (H2020 FORECEE). The dataset includes genomic and metagenomic (microbiome) data as well as data from matching buccal and blood samples. The team found that women with ovarian cancer or at higher risk for the disease (e.g. those with *BRCA1* germline mutations) tended to have different microbial diversity in the vagina compared to women without ovarian cancer and identified a DNA methylation signature in cervical epithelial cells that predicts cervicovaginal microbiome status. The research team have also delivered the most ambitious omics-based holistic study of women who carry a BRCA mutation to date (BRCA UNITE) and continue to explore entirely novel methods for cancer prevention and prediction.

Our UKFOCSS research team presented the primary analysis on the impact of screening for ovarian cancer in high risk women and published the paper in the Journal of Clinical Oncology. The successful completion of the trial was highly commended in the accompanying Editorial and presented at ASCO.

The first ever NHS ovarian cancer early detection service pilot completed in 2020. Led by Adam Rosenthal, the UCLH Cancer Collaborative launched the pilot project of an NHS ovarian cancer surveillance service for women who carry a faulty BRCA gene and have chosen not to have their ovaries and fallopian tubes removed. The pilot, known as the ALDO project (Avoiding Late Diagnosis in Ovarian Cancer), recruited 2,000 women aged over 35 from across England between 2018 -2020 and used a blood test as part of an NHS service to detect ovarian cancer amongst BRCA-carriers before they have any symptoms. The project which is about to report heralds a significant step towards meeting the recommendations in the National Cancer Strategy to improve early diagnosis.

In a remarkable first for psycho-oncology, we initiated work with psychology colleagues in UCLH cancer services where we lead the UK training and research hub for the international clinical roll out of an expressive therapy designed specifically for advanced cancer patients. This is the only example of practitioners being systematically trained in an RCT evidenced talking therapy.

### **Neonatology**

The department's pioneering internationally recognised neonatal neurology and pain research has continued to be successful along with the long established international excellence in neonatal neurodevelopmental follow up. In addition it has demonstrated particular strengths in acute care in neonatal neuroscience, advanced neuromonitoring, optical and MR imaging and neonatal respiratory and intensive care. The department has been very successful in pioneering novel therapeutics for acute neonatal encephalopathy (NE) and respiratory distress syndrome (RDS) and has pioneered the study of neonatal pain (Meek, Fitzgerald). Recent awards of a £2.9M MRC grant for the development of stem cell therapy for asphyxia (Robertson), a £1.5M award from the Bill and Melinda Gates Foundation (Robertson) and a £2.8M MRC grant for the development of recombinant surfactant protein D to prevent neonatal chronic lung disease (Clark) and over £1M in grants for pain research (Meek, Fitzgerald) mark out UCLH neonatal unit as an innovative pioneering centre in acute care of sick neonates. The research training supported by these awards includes training in commercialization of novel therapy with

industrial [partnerships (eg Chiesi Farmacia, Vectura and Astra Zeneca) assisting in the translation of basic science findings from bench to bedside.

No other neonatal unit in the UK has the breadth of research addressing acute care for the sick neonate. Funding from the MRC - £2.8 M for novel therapeutics to develop new therapy to prevent neonatal lung disease (Clark), and £2.9 M to develop stem cell therapy for birth asphyxia (Robertson), based on laboratory models of respiratory (Clark) and neurological injury (Robertson, Gates Foundation, £1.5M) . Acute care is supported by novel technology in assessing fetal lung maturity (Clark, Co-I -EPSRC £1M) and pioneering the use of near infra red spectroscopy (NIRS) in clinical care of asphyxia (Wellcome Trust £1M, S Mitra). The unit at UCLH delivered the first ever cot side optical monitoring of brain metabolism in neonatal encephalopathy and neonatal seizures using broadband near infra-red spectroscopy (NIRS), the first ever 31P MR spectrum obtained from a human brain as early as 1983 (in a baby with neonatal encephalopathy) and identification of secondary energy failure in a baby following perinatal hypoxic ischaemic injury. Multidisciplinary collaboration with a team of medical physicists and biomedical engineers within UCL, have developed novel optical technologies to monitor neonatal brain and resulted in a state-of -the-art optical platform that can monitor brain haemodynamics and metabolism at the cot side. Together with EEG and multimodal monitoring of systemic parameters, this optical system promises a new era in acute neonatal neuromonitoring in neonatal intensive care. This is currently being used in the neonatal unit in UCLH for an early assessment of injury severity using optical biomarkers following neonatal encephalopathy and identification of real-time changes in brain physiology during neonatal seizures and the relationship to their future outcome.

The department at UCLH hosts the leading neurodevelopmental outcome research programme in the UK (Marlow, EPICURE over £9M from MRC).

The current senior investigators on the UCLH Neonatal Unit combined have supervised 25 PhD and MD theses over the past 10 years and have authored over 500 research publications on neonatal topics.

## Strategic Goals for Planning Cycle from 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 over 20 years. Recruitment continues to be healthy without marketing but we have discussed marketing with UCL over the next five years to attract men to IfWH as part of our EDI strategy. Our MRes programme was launched in 2019 to allow greater laboratory time to postgraduate students who wish to undertake an in-depth research project. Although it was not open in 2020 due to COVID, we have now reopened the program in Q3 2021 with its largest student cohort to date.

We have reorganised our Senior Education Team in 2021 with new co-Directors of Education and 4 new Programme Directors for the MSc and MRes programmes. At the same time, we have enlisted many new module co-leads to spread the workload of teaching more equitably throughout the department. These roles also allow junior and mid-career academics to gain experience of teaching and leadership roles for their promotion portfolios.

Like most departments, our PTES results for 2020/21 were poorer than in previous years due to the disrupted teaching during the COVID-19 pandemic. In addition, our response rate was lower than usual

(34%) making it difficult to interpret too much from this data. Nevertheless, we achieved scores above the Faculty average in areas such as Teaching and Learning and Student Engagement. One notable area of relatively low scoring was Organisation and Management at least partly due to chronic under-staffing of our Teaching administration roles. A full time Grade 6 administrator is now in post which should help to facilitate improvements in this area.

Our Research Skills week was introduced in 2020 to provide iBSc and MSc/MRes students with information and skills relevant to their research projects. This blended week of face-to-face, live online and offline recorded resources has again received excellent feedback. We continue to deliver one of the most comprehensive careers and employability programmes in UCL over six sessions. Numerous alumni help with the delivery of these sessions and the feedback continues to be very positive.

We have continued to respond to student feedback regarding additional academic and pastoral guidance throughout the student journey. Programme Directors began weekly meetings with their cohorts during the first lockdown in 2020 and these have now become embedded in our educational practise. These sessions give students a frequent and informal place to bond with their peers, ask questions and discuss any concerns.

Our innovative new MSc in Obstetric Ultrasound in collaboration with UCLH starts Q3 2021 and brings together academic excellence and specialist clinical training in fetal imaging to enhance employability to students who graduate from the course. This is the first such course launched in collaboration with UCLH. If successful we plan to investigate an MSc in Gynaecologic Ultrasound, another area with a lack of postgraduate training.

The iBSc has four set modules and no optional modules to ensure that we had adequate student numbers in the first few years. This academic year iBSc students from other medical schools are now eligible to enrol. We are developing a BSc programme in Global Women and Child Health (jointly between IGH, 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 our first MOOC “Making Babies in the 21s Century” was launched in 2016. We aim to complement these courses with further distance learning and life learning courses.

As a result of the pandemic all academic staff have adapted to online and hybrid delivery of the taught courses, which allows the programmes to accommodate changes in Covid regulations, as well as provides accessibility for a larger variety of students and introduces new types of teaching sessions. All assessments, apart from one module, have been changed to written essays. We have had great success with bringing in NIHR competition funded Academic Clinical Fellow (ACF) and Academic Clinical Lecturer (ACL) posts at IfWH, not only in O&G (1 UCL funded NIHR badged ACL 2020) but also in Sexual and Reproductive Health (SRH, 3 ACFs in 2019, 2020 and 2021) and in neonatology (1 ACL in 2021, the first such post at UCL).

Two clinical ACF trainees were successful in MRC funded Clinical Training Fellowship applications for 3 year PhD funding on projects on Stillbirth and In utero stem cell transplantation.

A business case was approved to transfer 2 PAs to a Hon Senior Lecturer and consultant in Reproductive Medicine at UCLH, due to the reduction in 2PAs for an Associate Professor in Reproductive Medicine who has retired and now has a short term contract.

Vasanti Jadvha has taken over the teaching load previously carried out by Helen O’Neill who is on secondment for 3 years.

As part of research into communication between doctors and parents on the neonatal unit we have developed 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.

This work led to the first 2-day communication workshop Jan 27-28 (Nottingham) focusing on post natal depression after loss of pregnancy/stillbirth and will continue annually. The importance of this work was flagged by an **NIHR Alert (NIHR Research) 2021**

Marlow N, Shaw C, Connabeer K, Aladangady N, Gallagher K, Drew P. End-of-life decisions in neonatal care: a conversation analysis analytical study. *Arch Dis Child Fetal Neonatal Ed.* 2021;106:184-188

Selected as an NIHR Alert: <https://evidence.nihr.ac.uk/alert/parents-meaningfully-involved-care-decisions-critically-ill-baby-when-given-options-not-recommendations>

We launched two new scholarships in 2021, a BAME MSc and a BAME PhD Scholarship award, the first MSc scholarship has been awarded on the MSc in Women's Health programme.

The EGA Hospital Charity Trustees are launching a PhD fees funding scheme for prospective IfWH postgraduate students to encourage clinicians and scientists to study at the Institute.

In 2022 we will launch across UCL Partner Hospitals a midwifery fellowship scheme using the Annie McCall UCL Legacy. This will provide up to £50k for 2 rounds of one year fellowships to invest in development of midwifery clinical academics.

#### **Education 5 years strategic priorities 2022-2027**

- Aim: to develop the next cadre of clinical academics in O&G, Neonatology and Sexual Reproductive Health by increasing our opportunities for Clinical Academic Trainees through consistent success in securing NIHR ACF and ACL posts at IfWH, and by generation of locally funded NIHR badged posts; conversion of these ACF and CLs into successful competitively awarded PhD fellowship applications.
- Aim: to grow our postgraduate taught programs in gynaecology through the development of an MSc in Gynaecologic Ultrasound in collaboration with Women's Health Division at UCLH, building on a successful MSc in Obstetric Ultrasound launched in 2021.
- Aim: to develop our undergraduate taught programs through exploring a BSc programme in Global Women and Child Health (jointly between IGH, ICH and IfWH)
- Aim: to increase the under representation of BAME students on our programmes through the introduction of BAME scholarships which will provide mentored fellowship opportunities for students at Masters and PhD levels.

#### **Research**

Over the past 5 years the Institute has led on over 230 funding applications, achieving an average success rate of 30%, with a combined award value £21.6m.'

In 2020/21 we were successful in having financial approval to recruit to a number of posts, 2 in Women's Cancer, one clinical professor and associate professor, a lecturer in Maternal and Fetal Medicine, a clinical lecturer in Neonatology and a 0.5fte grants costing officer. Recruitment is ongoing for all of these posts, except for the grants costing officer.

We have also been awarded 5 NIHR trainees (2 Fellows and 3 Lecturers) to commence in 2021-3.

#### **Maternal and Fetal Medicine Goals:**

- Establish a new cell-free therapeutic using small extracellular vesicles (EVs) for the treatment of musculoskeletal diseases and cerebral pathologies.
- Develop personalised medicine for the treatment of the rare disease osteogenesis imperfecta including recruiting patients for a first-in-human clinical trial of in utero stem cell transplantation to treat osteogenesis imperfecta.
- Commence an MRC DPFS funded pre-clinical efficacy study of a novel maternal gene therapy for severe fetal growth restriction using adenovirus VEGF vector;
- Determine the mechanistic role of miR-142 and placental extracellular vesicles in preventing cardiac dysfunction in obese women.
- Establish fetoscopic surgery for spina bifida *in utero* at UCLH/UCL in collaboration with Professor Jan Deprest from KU Leuven, Belgium.
- Map the maternal-fetal interface at a single-cell resolution to interrogate the aetiology of severe pre-eclampsia and identify potential disease markers. MRC application result awaited Mar 2022.
- Secure joint funding with American collaborators (UCSF) to investigate maternal fetal immune mechanisms (NIH funding).
- Sign off a joint PhD program between UCL IfWH and KU Leuven, Belgium in perinatal therapy, with GOS Institute of Child Health.
- Secure 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, with PDRA support for Dr Ashley Boyle.
- 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;
- Develop gene editing for Gaucher Disease.
- Secure a patent for gene therapy for an inherited childhood mitochondrial disease, in collaboration with Nandaki Keshavan, Shamima Rahman, Rajvinder Karda and John Counsell.
- Launch a national global bereavement training course at UCL short course; and global care principles.
- Validate virtual joint UCL obstetric training package with University Dar es Salaam , Tanzania.
- Expand portfolio of diabetes-focussed stillbirth prevention research.
- Lead large women's health RCTs with funding from NIHR.
- Successfully apply to be part of the Tommy's Charity Centre for Preterm Birth (application scheme launching Q2 2022). This would bring in £800k to the Institute, linking with 3-4 other UK institutions, strengthen our unique skills in pre-clinical & early phase pregnancy clinical trials in preterm birth & placental insufficiency, and neonatal outcome assessment.

### **Neonatology Goals:**

#### Acute Respiratory Care of the Newborn and Infants

- Orphan Drug Designation has been obtained for Recombinant human SP-D as a treatment for neonatal RDS to prevent the development of neonatal lung disease.
- Aim to execute a phase 1 safety trial of rfhSP-D in neonatal lung disease.
- Results from phase 1 safety trial likely to be available by end of 2022- plan for further DPFS application July 2022 for phase 2a trial of rfhSP-D to assess efficacy.
- Complete a mechanistic study of surfactant metabolism along with the RCT of surfactant therapy 2022/3 in ventilated infants with bronchiolitis (NIHR funding- £374k).
- Participate in new trial of nebulised surfactant for treatment of neonatal RDS in collaboration with Aerogen therapeutics.

#### Staffing:

To secure a proleptic appointment for Dr Subhabrata Mitra as Associate Professor in Neonatology



(currently on a Wellcome Trust 4 year Clinical Research Career Development Fellowship, 'Investigating the impact of seizures on newborn brain').

To appoint an Academic Clinical Lecturer in Neonatology (funding secured already).

#### Preclinical Neuroprotection Studies (Nikki Robertson)

- To deepen collaborations related to pre-clinical neuroprotection studies with the Roslyn institute, University of Edinburgh.
- To assess efficacy of an optimised dosing schedule of melatonin for augmenting hypothermic brain protection based on prior PK data and determine whether early clinical trials warranted.
- Continue to pursue DPFS funding (>£5m) for multi centre trial of melatonin in neonatal encephalopathy – ACUMEN study.

#### Near infrared spectroscopy (Subha Mitra, Nikki Robertson (neuro) Howard Clark, Jens Madsen (resp) )

- 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.
- To develop further optic near infra red and Raman spectroscopy as a rapid means to explore application of assessment of fetal lung maturity (EPSRC Funded).

#### Capacity Building and Training

- To appoint NIRS to the ACL postfetal brain in Neonatology after badging as NIHR late gestation and labour.
- To support development of nursing led academic programme in the neonatal unit.

#### **Reproductive Health Goals:**

Our strategy is to be recognised 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:

#### Staffing:

Succession planning to appoint an Associate Professor in Reproductive Health to replace an Associate Professor who will be retiring in the near future. IfWH is working on a Fellowship application a current subspecialty trainee in Reproductive Medicine at UCLH.

#### Reproductive Science and genetics:

- Securing grant funding for the reproductive science and genetics groups.
- Establishment of social science projects including social egg freezing, motherhood over 40, childlessness over 50, and how do parents tell their children about donor conception?
- Development of a new area of research - FemTech – to include work with app companies and research into menstrual cycle, fertility and pregnancy apps.
- Secure Royal Free Hospital clinical support for the ovarian tissue freezing programme.
- To expand the scope of preimplantation genetics research to disease prediction in later life.
- Follow up work on the use of add-ons in IVF.

### 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:

- Apply for NIHR Research Professorship a current Associate Professor to implement and evaluate ways to normalise conversations about pregnancy planning to reduce unplanned pregnancies and adverse pregnancy outcomes.
- Host 5<sup>th</sup> European Conference on Preconception Health at UCL IfWH in September 2022.
- Appoint a post-doc Fellow to work on linkage of national datasets in order to build reproductive health trajectories and support research to improve pregnancy planning and birth outcomes.
- Obtain funding to expand the work and impact of the UK Preconception Partnership (chaired by J Stephenson).
- Publish the first national 'report card' to describe and monitor the state of preconception health in England.
- Gain approval for the implementation of a validated measure of unplanned pregnancy (LMUP) into routine antenatal care nationally (over 600,000 births pa in England).
- Validate new measures of future pregnancy preferences and reproductive autonomy with non-pregnant women in the UK.
- Establish a future funding model for a popular interactive website to aid women's choice of contraceptive method, developed at IfWH [www.contraceptionchoices.org](http://www.contraceptionchoices.org)
- Apply for funding to investigate new areas, including the relation between preconception vaginal microbiome, pregnancy and birth outcomes; and the relationship between folic acid and tongue tie.
- Take on two new PhD students with interests aligned to our research programme.
- Strengthen collaboration with University of Sao Paulo, Brazil (measurement of pregnancy intention) and SPHERE, Monash University, Melbourne (delivery of preconception care in the community).

### **Women's cancer Goals:**

To maintain and expand our productivity and our keen-edged research focus on predication, early detection and prevention of women's cancers we need to:

- Appoint a Professor of Gynaecological Oncology (50:50 clinical/academic) to regenerate the Department and lead investment and grant funding initiatives for research, scientific discovery, and translation in the speciality.
- Appoint a Professor/Associate Professor in Women's Cancer Science to capitalise on the legacy generated by the late John Timms and his Proteomics group.
- Play a central role in UCL's highly prioritised Mass Spectrometry Science Technology Platform (MS STP) through the development of a MS STP IfWH hub for which central strategic support will be required.
- Appoint a Grade 9 Statistician/Data Scientist to the MS STP IfWH hub who would bring valuable expertise in the development of novel AI approaches for the analysis of complex longitudinal multi-dimensional data that is of high importance for women's health and UCL's MS community.
- Maintain the momentum and high-volume productivity of the Computational Biology Group and appoint a lead Computational Biologist.
- Expand on a dedicated research clinic that allows us to offer personalised screening and prevention trials.

- Continue to contribute to prevention across women's cancer.
- Continue to translate our validated early detection biomarker panels in ovarian, pancreatic and colorectal cancer into more rapid diagnostic pathways.
- Continue to develop new data analysis methodologies for integrative analysis of multi-omic data to identify longitudinal, network and deep biomarkers on the basis of longitudinal, network, ensemble and artificial intelligence algorithms.
- Synchronize mining of new data and construction of data bases with methodologies under development to provide optimal analysis of data.
- Submit several major grants (CRUK, MRC). We expect that a mixture of potential funding sources i.e. The Eve Appeal Charity, the formation of a spin-out company under the leadership of The Eve Appeal, consultancy-activity of the incoming Gynaecological Oncology Professor, income /consultancy and core funding will be able to generate sufficient funding.
- Conduct judicious succession planning for the patient experience/quality of life dimension of developments in the field of women's cancers.
- Expand our doctoral student community by supporting Fellowship applications.

#### **Research - 5 years strategic priorities 2022-2027**

- Aim: to become the leading UK centre for pre-clinical & early phase pregnancy clinical trials in, for example, obstetric surgery, preterm birth, fetal growth restriction & placental insufficiency. To translate into the clinic prenatal and neonatal stem cell, gene therapy, extracellular vesicles and nanoparticle treatment of inherited and acquired paediatric pathologies, neonatal pre-clinical and phase I-III neuroprotection trials for neonatal encephalopathy and neonatal outcome assessment.  
Through this we will make a significant contribution to the field of stem cell and gene therapy translational medicine, transform child health, deepen our understanding of stem cell biology, develop personalised cell therapy, and engineer innovative clinical grade therapeutics with commercialisation potential.
- Aim: to make a key contribution to Preconception/Interconception Health through securing programme/grant funding, making strong links with stakeholders especially primary care partners to deliver a new national policy of investment in pre-pregnancy health for women and men and create strong links with FemTech, to improve education and personalised knowledge of menstrual health, fertility, and pregnancy.
- Aim: to consolidate our expertise in non-cancer gynaecology clinical trials in endometriosis, urogynaecology/mesh surgery, paediatric adolescent gynaecology and menopause through evidence synthesis, and close collaboration with UCL Clinical Trials Units.
- Aim: to make North Central London a hub for excellence in the development and implementation of women's cancer prediction tools, clinical trials and personalised medicine to potentially include breast cancer as well as ovarian, uterine, vulval and vaginal cancers.

#### **Overall Issues**

The Institute space is spread across 8 buildings and our long-term ambition is to have one space that to bring together our staff and students from across the sites.

Although there has been improvements and refurbishment of the ground floor laboratory space at Chenies Mews, the other laboratory space is not of the standard expected for the quality research taking place and the vision for the Institute.

There have been a lot of rearrangements in Chenies Mews over the pandemic to accommodate staff and maintain social distancing. These will need to be re-examined to ensure HFEA licencing conditions are maintained once embryo research work is resumed and expanded.

Our longstanding issue with space at the Royal Free Hospital continues, prior to the pandemic Associate Professor Paul Hardiman's group was given space on the ground floor, this space was inadequate and he was then moved to UCL Immunology labs on the 2<sup>nd</sup> floor, however due to the pandemic the space was unused for some time. There was also an issue with this space and this has now been resolved but we have been advised that since Immunology has moved out to the new Pears Building it is uncertain whether we can remain in the said space. This situation continues to cause stress to the PI and to his students

## **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 has been through the development of the first terminology for maternal and fetal adverse events in clinical trials, led by Anna David through the EVERREST consortium and international partners. The Medical Dictionary for Regulatory Affairs, MedDRA adopted all the proposed new terms (12 maternal, 19 fetal) in March 2016, and a Delphi process begun in 2017 has now completed, with publication in a leading international journal. Regulatory authorities (MHRA, FDA, EMA) are working with Prof David to disseminate this new Maternal Fetal Adverse Event Terminology (MFAET version 1.0) through international meetings, FDA publications and workshops.

Prof David is Co-Chair of Maternal Health Project Group of ABPI (The Association of British Pharmaceutical Industry) and is also a member of the Policy Commission on Effective, Safe and Accessible Medicines in Pregnancy, University of Birmingham lead by Professor Peter Brocklehurst and Dame Eliza Manningham-Buller.

Prof David is consults for an industry funded trial of a novel intra-amniotic protein therapy for a congenital single gene disorder.

Prof David and Prof Siassakos are co-applying for patents with engineers, aiming to bring innovation from the lab to bedside care for obstetric surgery.

Simon Waddington's group is involved in the following:

1) We have an ongoing and highly productive collaboration with AskBio Therapeutics (formerly Synpromics). A member of their staff (Hayder Abdul-Razak) worked in our team and received training for two years. They funded an Impact PhD studentship for one of our students, Riccardo Privolizzi. Dr Jo Ng has been working with them to draft a new project consultancy with them.

2) Jo Ng & Raj Karda worked with a large gene therapy company to embark upon a two year project consultancy to develop gene therapy for an inherited epilepsy.

3) Simon Waddington has been working with Manju Kurian, Paul Gissen and Ahad Rahim to form a spin-out company based upon five gene therapy projects. They are currently engaged in extensive discussions with two VCs and one gene therapy company.

In neonatology (HC) acts as a Consultant for Chiesi Farmaceutici and Astra Zeneca. The commercialisation of rhSP-D as an anti-inflammatory therapy is being pursued in tandem by Trimunocor Ltd a start up company founded by HC.

Helen O'Neill was awarded a UKRI Innovations Scholars Secondment award starting February 2021 for three years; project title: The Use of A Combined Clinical Symptom and Biomarker-Based Model to Predict Risk of Developing Reproductive Conditions and Fertility Potential. The vision of the project is to address two major challenges (1) the lack of access to reproductive testing and (2) the lack of diagnoses for common reproductive pathologies.

Our academics' engagement with UCL Consultancy has increased since 2018 and we are receiving steady income, in 2018-19 = £133,548 and 2020 – to date £280,000.

#### **Enterprise - 5 years strategic priorities 2022-2027**

- Aim: To successfully spin out a company based upon five gene therapy projects, through collaboration between Gene Transfer Technology Group, GOS ICH and UCL School of Pharmacy.
- Aim: To bring innovation from UCL Healthcare Engineering to bedside care for obstetric surgery through development and patenting of novel oxygen and pressure sensing and operative imaging devices to improve maternal and neonatal outcome in labour and operative birth.
- Aim: To progress commercialisation of novel drug development for neonatal chronic lung disease initially through further DPFS funding for phase 2 trials of recombinant human SP-D and subsequent commercial sponsorship.

#### **International Activities and Partnerships**

Our Ongoing collaborations include the following:

- Dr Hillman (IfWH) and Dr Saville (IGH) on work in Nepal and India.
- Dr Hall and Dr Osrin on LMUP work in India and with Dr Hall and Dr Saville on LMUP work in Nepal
- Dr Helen Harris-Fry LSHTM and Dr Hillman (Nutritional status of pregnant women India).
- Dr Hall and Dr Barrett collaborate with research groups across the world working on the measurement of pregnancy intention, in particular research in Brazil with Dr Ana Borges of the University of Sao Paulo.

- Dr Terence Leung Medical Physics and Biomedical Engineering developing non-invasive smartphone technology to detect anaemia in pregnant women (with Dr Sara Hillman) and to screen newborns for jaundice (with Dr Judith Meek).
- Medical Education work in LMIC including Development and delivery of remote training course for Obstetric Haemorrhage between clinicians at UCLH and health workers in Mbeya hospitals, Tanzania and fetal echocardiography training courses in India with team members from the UCLH Fetal Medicine Unit.
- Professor Ahmed Hussein from Cairo University, Egypt works with Prof Eric Jauniaux on Abnormally Invasive Placenta and Caesarean section.
- Professor D Siassakos (IfWH) with the Mediranean University (Egypt) on a joint PhD programme focusing on polycystic ovary syndrome and pregnancy outcome; and with the University of Athens (Greece) on establishing a national training programme in obstetric emergencies.
- Professor D Siassakos (IfWH) with members of the International Stillbirth Alliance from >30 countries working on improving global standards in care for parents with perinatal death.
- We are involved in Medical Education work in LMIC including Development and delivery of remote training course for Obstetric Haemorrhage between clinicians at UCH and health workers in Mbeya hospitals, Tanzania.
- REACH Alliance with University of Toronto- UCL identified as key partner. IfWH centrally placed within roll out program. Dr Hillman, alongside Dr Roll (Institute for Innovation and Public Purpose) and Dr Sarah Quinell (Institute Science Technology Engineering and Public Policy) have adapted the REACH design to fit UCL students.
- Dr PV Guillot with the Hospital Robert Debre, Paris France (Professor P Gressens), neonatology.
- In education, we continue to work with colleagues in Paris Descartes University in an exchange programme for medical students and trainees in addition to expanding research collaborations in prenatal therapy. To date we have received four students from Paris and have sent three. The programme was paused in 2020 and 2021 due to Covid but the plan would be to restart for 2022.

#### **Global Engagement and strategic partnerships- 5 years priorities 2022-2027**

- Aim: to develop global reach in Medical Education in low-and-middle-income countries for obstetric emergencies improving links between IfWH clinicians and local health care workers in India and Africa.
- Aim: to further enhance the impact of research on the measurement of pregnancy intention to research groups across the world in particular Central and South America and to develop collaborations in preconception research, with a focus on evidence-based interventions in primary care and public health, with nascent groups in Australia.
- Aim: to translate novel diagnostic devices: non -invasive smartphone technology to detect anaemia in pregnant women and to screen newborns for jaundice, and pre-clinical neuroprotection studies to clinical neuroprotection trials in low-and-middle-income countries in collaboration with Bill and Melinda Gates Foundation.
- Aim: to have launched and part completed a major fundraising campaign to secure new consolidated space for IfWH within UCL Estate, making strong philanthropic links with OVPA donors and UCLH Charity.
- Aim: to establish and maintain strategic collaborations with academic universities in Egypt, Canada, Greece, Belgium and France to support research and education programmes. eg 1.Mediterranean University (Egypt) are working on a joint PhD programme focusing on polycystic ovary syndrome and pregnancy outcome

2. University of Cairo (Egypt) on better care for women with placenta accreta spectrum.
  3. University of Athens (Greece) on establishing a national training programme in obstetric emergencies
  4. establish the Joint Perinatal Research PhD programme with KU Leuven
  5. Fetal Growth Restriction collaboration and medical student exchange with Paris Descartes, France.
- Aim: to consolidate strategic collaborations with European academic institutions in Austria, Sweden and the Czech Republic for women's cancer prevention to position UCL as a partner in forthcoming HORIZON Europe major grant call.

## **Enabling Delivery of the Academic Strategy**

### **Finance and KPIs**

The Institute continues to maintain a contribution to the Centre of around £3m per year. Our business case proposal in early 2021 to recruit two senior staff in Women's Cancer, a lecturer in Maternal and Fetal Medicine and a clinical lecturer in Neonatology was successful.

### **Estates and Space Management**

The Institute continues to struggle with a difficult estate situation. For a relatively modest sized Institute we occupy eight 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 slightly increased this year (from 63 to 74) so there is no urgent need for additional space. We continue to need common space which is fit for purpose.

Our laboratories are based in Chenies Mews, Paul O'Gorman Building, Zayed Centre for Rare Disease, Cruciform, Queen Square and the Royal Free. In 2019/20 we were successful in obtaining a SLMS small works grant to refurbish the ground floor lab on the ground floor Chenies Mews, this was welcome timing to accommodate our new staff in Neonatology.

We submitted an Academic Proposal for space in 2019 and reviewed the cost of a previously developed architect plan for a new building sited in existing IfWH premises in Chenies Mews (86 – 96) and adjoining (98 Chenies Mews). No further action has been taken due to the pandemic and the incoming Provost who plans a UCL strategy review. We continue to highlight the need for consolidated space at the Faculty and central UCL level to realise our vision for the Institute and are keen to work to promote this in the new UCL strategy.

### **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). With The Office of the Vice-President Advancement (OVPA) we have developed a Donor Brochure to highlight the Institute's unique life-course approach and to provide various fundraising areas. We successfully sourced funding from the Mitchell Family Trust and the Portrack Trust to support a new study in stillbirth (£140,000). There are now discussions to have conversations with Weston Foundation.

In order to improve communication of our strategic vision to a wider audience to include the public and potential donors we have developed a long fundraising document.

The Institute Director and Deputy are working with the new Clinical Director Dr Stuart Lavery and Divisional Manager to ensure collaborative working to secure major donations and a newly launched UCLH Charity remit to fundraise around women's health.

The EGA Hospital Charity Trustees are launching a PhD fees funding scheme for prospective IfWH postgraduate students to encourage clinicians and scientists to study at the Institute.

In academic year 2020/21, we launched two BAME scholarships, one MSc and one PhD. The PhD scholarship has not yet been awarded but we currently have one interested candidate.

We are currently drafting a proposal for our Annie McCall Midwifery PhD scholarship using a UCL endowment / legacy fund, to support midwives to develop research proposals across UCL Partners Hospitals, to launch Q2 2022.

Our 15 year IfWH Report published in 2020 celebrates the work we have achieved across the Lifecourse of Women, from early development to menopause since the launch of the Institute in 2004. The report highlights the major impacts the Institute has had on women's lives.

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). In 2019 we prepared a video celebrating 20 years of our MSc programmes.

## **People**

As of 1<sup>st</sup> November 2021 our current staff number is at 74.

We submitted our renewal for Athena SWAN Gold in November 2020 and have sustained impact in the following areas:

Completion of both IfWH and UCL surveys have increased consistently over the past 5 years with an average of 74% completion and over 80% of staff consistently agree that IfWH promotes gender equality with an average of 79% feel a strong sense of belonging to both IfWH and UCL.

We have achieved gender balance at senior levels by encouraging active participation on leadership courses for female academics and improving promotion procedures ensuring equity of opportunity.

We have normalised flexible working which is taken up by staff of all grades.

Our Appraisal completion rate has remained consistently good over the past 3 years at almost 100% although this dipped slightly during 2020.



Our Career surgeries were successful with all staff who wanted a consultation was accommodated. This will soon be relaunched after COVID to ensure new staff and early career researchers are given this opportunity.

In 2020 we introduced a Promotion review system where each member of staff is reviewed annually by their HoD for consideration of promotion prospects or accelerated increment application call. This has resulted in successful increment and promotions applications for staff who were previously not being considered.

#### **Equality and diversity - 5 years strategic priorities 2022-2027**

- Aim: to successfully renew our Athena Swan Gold Award in 2024 demonstrating our ongoing commitment to EDI including disability and race.
- Aim: to address our gender imbalance in IfWH (only 30% of our research staff are male and >90% of our students are female) through developing a marketing strategy with UCL over the next five years to attract men to IfWH and to increase take up of male students on our education programmes.

#### **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. It is to be noted that three Heads of Department have no PAs and support is through the core team. Research applications have remained steady and in fact increased during the pandemic and this was in spite of the Costing officer vacancy. Having recently recruited a Costing Officer into the post, this now provides the Institute with the potential to provide academic and clinical colleagues with the necessary support to maximise grant opportunities in the future.

The challenges of the pandemic have been felt by all but each team has pulled together well. The HR team had to deal with the launch of the new MyHR system which added to the stress of initially working from home. As well they learnt to conduct on-line interviews whilst getting used to Teams soon after the pandemic started. The Education team has risen to the challenge of on-line teaching and adapted quickly but it was a very stressful time, in particular for those who were carrying out childcare. We have launched a new MSc in Ultrasound and was successful in combining the part-time admin post attached to the business case with a recent 0.5fte education admin leaver to recruit a full-to time post which will better support the team.

#### **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*

1. *Risk:* Failure to attract an internationally recognised clinical academic in gynaecologic oncology to our Professor of Women's Cancer post. Failure to secure sufficient clinical PAs (5 needed) to support the new post at UCLH.

*Mitigation:* close working with Women's Cancer clinical team at UCLH to identify potential candidates; informal discussions between IfWH senior staff; input from Cancer Institute senior staff; business case to

support additional clinical PAs provided to Stuart Lavery to request from UCLH Charity (UCLH Specialist Hospitals Board have advised this course of action).

2. *Risk:* Difficulty in recruiting a clinical academic in Department of Reproductive Science with no replacement in sight to provide clinical input to this research area.

*Mitigation:* Support NIHR fellowship application an ACL and Reproductive Medicine Subspecialty trainee, and apply for business case to appoint as Assoc Prof October 2022.

3. *Risk:* Dependence of large funding opportunities on a handful of senior clinical academic/academic staff with planned retirement of at least 3 in the next 3 years (DoWC, DRS, DMFM).

*Mitigation:* long term strategy to apply for NIHR competitive funding for ACF and ACL posts; IfWH wide Early Career Researcher network established; formal process to review fellowship and grant applications (chalkboard initiative similar to that at GOS ICH). Applications to NIHR Fellowship schemes in progress for Dr Katie Gallagher (neonatal nurse).

4. *Risk:* Difficulty recruiting or poor student experience in the new MSc in Obstetric Ultrasound which requires significant combined teaching input from WH Division staff at UCLH and IfWH.

*Mitigation:* regular and intense support for new MSc lead Dr Raffaele Napolitano from Education Directors and MFM clinical academic staff.

5. *Risk:* Government withdrawal of ODA funding to support global health research initiatives.

*Mitigation:* Team members from IfWH (Hall and Hillman) has been engaging with members from the UCL Research Services Team and funding bodies (Medical Research Council) to investigate potential strategies to secure funding. Apply for non-governmental funds eg Gates, CZI.

## **APPENDICES**

### **ACADEMIC VISION and ACHIEVEMENT FOR EACH RESEARCH DEPARTMENT**

#### **Maternal and Fetal Medicine:**

1. To understand the pathophysiology of gestational syndromes such as fetal growth restriction, pre-eclampsia, gestational diabetes, and preterm birth, including their epigenetic mechanisms;
2. To assess the safety and efficacy of novel therapies (stem cell therapy, gene therapy, extracellular vesicle therapy, immune suppressive drugs) to treat gestational syndromes (stillbirth, preterm birth and fetal growth restriction), musculoskeletal pathologies, neonatal encephalopathies, bleeding disorders, metabolic disease, neurodegenerative disease and epilepsy of childhood.
3. To develop innovative obstetric and fetal imaging and surgery in collaboration with UCL Centre for Medical Image Computing and the Wellcome Trust/EPSRC Centre for Surgical and Interventional Sciences; to offer fetoscopic fetal surgery for congenital spina bifida, with a view to developing novel patch techniques in collaboration with GOS ICH;
4. To train outstanding scientists and clinical academics to develop novel prenatal therapies.

#### **Maternal and Fetal Medicine Achievements 2019/2020**

- Pascale V Guillot secured funding to advance the treatment of neonatal encephalopathy using extracellular vesicles: Medical Research Council (MRC) “Extracellular vesicles produced by hiPSC-derived mesenchymal stem cells (iEV) for the neuroprotection of the brain following neonatal encephalopathy”. £751,752 .
- Associate Professor and Consultant in Obstetrics Dimitrios Siassakos joined IfWH two years ago, bringing clinical academic expertise in high risk pregnancy, team management of emergencies, Interprofessional Training, Patient Safety and Quality of Care, Perinatal Loss Prevention & Care. He was awarded an NIHR-funded trial of rotational birth (1.8M). In addition as Deputy Clinical Director of WEISS, the Wellcome Trust and EPSRC Centre for Interventional Surgical Sciences, he has obtained two year renewal funding from Wellcome Trust, overseen the award of new NIHR trainees, and been promoted to a full Professor. There is particular focus on gestational diabetes and prevention of stillbirth, with a portfolio of early studies with Prof David on novel healthcare engineering research.
- The Gene Transfer Technology group (Karda, Ng) have received three major grants: VC Investment via UCL Business, Karda R (Co-PI), Ng J (Co-PI), Waddington SN, Schorge S, 2020 “AAV gene therapy for EEF1A2” £1,5M. Ala’a Siam overseas student starting PhD with Raj Karda, John Counsell, Simon Waddington.
- GOSH Charity and Sparks/Dravet UK Charity, Karda R (PI), Waddington SN, Schorge S, Counsell RJ, Moore M (1.6.20 – 1.6.22), “Novel gene editing approach for Dravet syndrome £250k.
- Funding was secured from UCL IfWH and Medical Physics (1 day per week) to extend the secondment for Prof Jan Deprest for another 5 years and continue the collaboration with GOSHCC Charity (1 day per week). UCLH Charity funding for 10 clinical cases has been secured (£220k).
- Associate Professor Sara Hillman has used her clinical expertise to establish a multidisciplinary fetal medicine genetics clinic at UCH. She is CI for a newly successful award from Chan Zuckerberg (\$1.5M) to study molecular mechanisms of late fetal organ development which builds on the clinical service. She has is running trials to address anaemia in pregnancy in India/ Nepal with funding from the MRC/Newton Fund (£843K). She has developed a virtual obstetric

training project successfully run in Tanzania with funding from THET (£87K). Close collaboration and generation of pilot data with UCL Genomics has resulted in the generation of new -single cell and spatial pipelines.

- Professor Donald Peebles was appointed as NHS England National specialty adviser for Obstetrics in 2020, working 2 days a week on secondment from the NHS and UCL.

### Neonatology Academic Vision

- to assess the safety and efficacy of novel therapies in acute respiratory care of the newborn in clinical phase 1 and phase 2 trials.
- the UCL piglet birth asphyxia model and progress our translational neuroprotection research from the laboratory into phase I and II clinical trials. To develop the model further to include an inflammation-sensitized injury and assess the effect of neuromodulation on neuroprotection.
- 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 and Global Health
- 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 and diagnostics
- to develop expertise in novel research-based communication training in neonatal intensive care

### Neonatology Achievements 2019/2020

- Successful transfer of the neonatal therapy of surfactant to adult COVID 19 respiratory failure-UCLH first in world to treat COVID 19 with nebulised surfactant *Nebulised surfactant for the treatment of severe COVID-19 in adults (COV-Surf): A summary of a study protocol for a randomized controlled trial*. Dushianthan A, Clark H, Madsen J et al;. *Trials*. 2020 Dec 10;21(1):1014. doi: 10.1186/s13063-020-04944-5.
- Multicentre study with Chiesi potentially gives wider access to surfactant therapy for patients in the UK. Currently open and recruiting at UCLH, shortly at C/W and Southampton, Italy and USA. Poractant alfa - curosurf and SARS- COV-19 ARDS (Covid-19). NCT04502433. ClinicalTrials.gov. National Institutes of Health; 2020. Updated January 20, 2021.<https://clinicaltrials.gov/ct2/show/NCT04502433>.
- Successful GMP manufacture of rfhSP-D in readiness for phase 1 safety trial in neonates and filing of patent for treatment of COVID-19 with rfhSP-D.
- The UCL Piglet model of perinatal asphyxia continues to be an important resource for safety and efficacy assessment of novel neuroprotective agents with and without therapeutic hypothermia. The focus is on clinical translation and relevance. In the last 2 years we have developed a model of inflammation-sensitized perinatal asphyxia, which has particular relevance for low resource settings. Alongside 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 Academic Vision**

RH brings together seven teams working on the clinical, scientific, global and ethical issues related to gynaecological function and development, Female Pelvic Medicine and Reconstructive Surgery, sexual and reproductive health, the ovary, reproductive science, preimplantation genetics and diagnosis and early placental disorders, under the new leadership Dr Sioban SenGupta since 2020.

- To continue to deliver high quality education to train the future leaders in reproductive health.
- To educate the public through various projects, making use of different types of media from still art, theatrical art and comic animations.
- To continue high quality basic science and clinical research across the breadth of reproductive health from the ovary to pregnancy.
- Translation of several research projects into the clinical setting, including the ovarian tissue cryopreservation programme, pregnancy planning via a new contraception web site and the use of adjuncts in in vitro fertilisation.
- To develop our global research programme.
- To integrate multi-disciplinary teams across the department and beyond, especially developing social science. One example is the establishment of a multidisciplinary team working on reproductive technologies.
- To bring together the academic and clinical departments at UCL and UCLH working on reproductive health, via the newly established Centre for Human Reproduction.

### **Reproductive Health Achievements 2019/20**

- Dr Jenny Hall through an NIHR post-doctoral fellowship (2017-2021) has introduced a validated measure of planned pregnancy into NHS maternity settings for the benefit of patients and populations.
- The CapCOVID Conception & Pregnancy Study at IfWH with UCLH Reproductive Medicine Unit found that unplanned pregnancies were almost twice as likely during first UK lockdown. In addition women were nine times more likely to have difficulties accessing contraception due to the pandemic.
- The Early Pregnancy Unit and the associated basic science research is recognized as a leading international centre 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 to Professor Davor Jurkovic and team. 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.
- Professor Davor Jurkovic is also a successful co-applicant on several NIHR funded portfolio studies into clinical early pregnancy research; PRISM, GEM3 and Mife-Miso which are leading to impactful research findings that are changing clinical care of miscarriage and ectopic pregnancy.
- Joyce Harper is a key player in the development of the Human Fertilisation and Embryology web site on IVF add-ons and was a co-author of the consensus paper on add-ons. Joyce is co-founder of the Fertility Education Initiative aiming to bring fertility awareness into the UK curriculum. She has led the third meeting of the European Society of Human Reproduction and Embryology (ESHRE) and the European Society of Human Genetics;

- A new reproductive endocrinologist is being appointed following the retirement of Dr Gerry Conway, an Honorary Associate Professor at IfWH and Consultant Reproductive Endocrinologist at UCLH.
- Hon Associate Professor and Consultant Urogynaecologist Sohier Elneil has been awarded an NIHR grant in women's experiences in urogynaecology as part of a DoH policy call. She leads the London Complex Mesh Centre at UCLH, one of 7 centres launched in response to NHS England's call for the provision of care for women experiencing complications after pelvic mesh insertion for continence and prolapse in a multi-disciplinary setting.
- Associate Professor and Consultant in Reproductive Medicine Dr Melanie Davies has received funding for two NIHR HTA grants on menopause treatment. POISE (£2.2M) is an RCT of the combined oral contraceptive pill versus hormone replacement therapy in women with primary ovarian failure. BLUSH trial (£2M) is an RCT of oxybutynin or venlafaxine for hot flushes in women who cannot or choose not to use hormone replacement therapy: randomised trial and economic evaluation.

### **Women's Cancer Academic Vision**

#### **Working For Women, Working Against Cancer**

The Department of Women's Cancer, headed by Dr Anne Lanceley since 2020 has a talented group of academics and clinicians dedicated to the Department's mission to conduct multidisciplinary research into women specific cancers, to create clinical interventions and to extend disease knowledge so that fewer women receive a cancer diagnosis and treatment and quality of life are improved for those who do. To achieve this, alongside our tertiary referral centre treating between 400 and 500 women with primary gynaecological cancers we have developed an integrated research pathway including all women specific cancers for risk stratification, prevention, early detection and diagnosis, which incorporates clinical, epidemiological, genetic, epigenetic, proteomic, symptom and imaging data, and applies them to populations.

- 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, founded on 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.

### **Women's Cancer Achievements 2017/21**

- UKFOCSS investigators and the research team presented the primary analysis on the impact of screening for ovarian cancer in high risk women and published the paper in the Journal of Clinical

Oncology. The successful completion of the trial was highly commended in the accompanying Editorial and presented at ASCO.

- The first ever NHS ovarian cancer early detection service pilot completed in 2020. Led by Adam Rosenthal, the UCLH Cancer Collaborative launched the pilot project of an NHS ovarian cancer surveillance service for women who carry a faulty BRCA gene and have chosen not to have their ovaries and fallopian tubes removed. The pilot, known as the ALDO project (Avoiding Late Diagnosis in Ovarian Cancer), recruited 2,000 women aged over 35 from across England between 2018 -2020 and used a blood test as part of an NHS service to detect ovarian cancer amongst BRCA-carriers before they have any symptoms. The project which is about to report heralds a significant step towards meeting the recommendations in the National Cancer Strategy to improve early diagnosis.
- The H2020 FORECEE project collected 7000 cervical smear samples from women with and without cancer and analysed the epigenomes of epithelial cells within these samples. The dataset includes genomic and metagenomic (microbiome) data as well as data from matching buccal and blood samples. Women with ovarian cancer or at higher risk for the disease (e.g. those with BRCA1 germline mutations) tended to have different microbial diversity in the vagina compared to women without ovarian cancer and identified a DNA methylation signature in cervical epithelial cells that predicts cervicovaginal microbiome status.
- Delivery of an ambitious omics-based holistic study of women who carry a BRCA mutation to date (BRCA UNITE) and continue to explore entirely novel methods for cancer prevention and prediction.
- In July 2020, two Margaret Spittle Cancer Clinical Research Fellowships (Gynaecological Oncology) were awarded by University College London Hospitals NHS Foundation Trust and commenced in February 2021:
  - i)The utilisation of DNA methylation markers in cervico-vaginal smear samples in women with aberrant bleeding in order to diagnose endometrial cancer. Martin Widschwendter Research Supervisor (Clinical Supervisor – Dr Nicola MacDonald).
  - ii)Supervisor (Clinical Supervisor – Dr Adam Rosenthal). Impact of the microbiome on ovarian cancer development. Martin Widschwendter Research Supervisor (Clinical Supervisor – Dr Adam Rosenthal).
- A substantial number and range of papers have been published including papers in Nature Communications, papers in Genome Medicine (including those providing the first proof of principle that cell-free DNA methylation is capable of detecting ovarian cancer up to two years in advance), a review paper published in the highly prestigious Journal Nature Reviews Clinical Oncology, and others in Psychooncology, Anthropology and Medicine.
- The Evening Standard featured an article on their cover-page entitled “London doctors on brink of creating first early warning system for four women's cancers”. Several other aspects of our work have attracted media attention.
- Ongoing achievement of the FORECEE, BRCA PROTECT and BRCA UNITE projects.
- Establishment of a multi-tissue biobank with tissue and DNA stored from >5000 women.
- In a remarkable first for psychooncology, we initiated work with psychology colleagues in UCLH cancer services where we lead the UK training and research hub for the international clinical roll out of an expressive therapy designed for advanced cancer patients. This is the only example of practitioners being systematically trained in an RCT evidenced talking therapy.

We have secured the following grants:

Prof Martin Widschwendter:

01/09/2017 – 30/08/2022: European Research Council (ERC) Advanced Grant (Europe’s most prestigious research award) - BRCA-ERC (Understanding cancer development in BRCA 1/2 mutation carriers for improved Early detection and Risk Control) – supporting BRCA PROTECT and BRCA PREVENT: €2.5M.

28/06/2017: €221,400. The Eve Appeal - funding for an Illumina NextSeq 500 Sequencing System for the FORECEE (Female cancer predictiOn using ceRvical cEll omiCs to individualise prEvEntion) programme:

06/04/2016 – 01/07/2020: €746,400 from The Eve Appeal to support Computational Biology in the UCL Department of Women's Cancer.

01/11/2021-31/01/2022: The Eve Appeal Strategic Programme Bridge Funding: €48,403

Dr John Timms

01/07/18- 30/6/21 with a no cost extension to 31/12/2021: funding from Cancer Research UK Application to build on ongoing efforts to develop serum biomarker panels for the early detection of ovarian, pancreatic and colorectal cancers using novel biomarker modelling approaches. The work will involve development of assays, application of novel modelling approaches and validation of biomarker models as possible screening tests. (PI transferred to Prof Alexey Zaikin).

01/07/2021 – 31/07/2023, £500k from Cancer Research UK to examine serial artificial intelligence/machine learning classifiers for personalised risk stratification and early detection of lung, bowel and pancreatic cancers in women (SAICRED) (PI Dr Oleg Blyuss).

Dr Anne Lanceley

01/09/2019 – 31/08/22: £70,000 from the London Doctoral Training Scheme Partnership Project/Economic Social Research Council/UCLH Charity for a comparative ethnographic study on the use of genetic testing in ovarian cancer and colorectal cancer clinics.