

THE UNIVERSITY OF MANCHESTER
PARTICULARS OF APPOINTMENT
FACULTY OF BIOLOGY, MEDICINE & HEALTH
SCHOOL OF HEALTH SCIENCES
PHARMACY AND OPTOMETRY
RESEARCH ASSOCIATE IN NOVEL NANOTHERAPEUTICS FOR PLACENTAL DYSFUNCTION
VACANCY REF: BM&H-017388

Salary: £33,309 to £37,467 per annum (depending on experience)

Hours: Full Time

Duration: 12 months

Location: Oxford Road, Manchester

Enquiries about the vacancy, shortlisting and interviews:

Name: Dr Lynda Harris
Email: Lynda.k.harris@manchester.ac.uk

The University of Manchester

The University of Manchester is one of the largest single-site universities in the UK, with over 40,000 students and more than 12,000 staff. We are located in the heart of Manchester, a world-class city that shares our pioneering, boundless spirit and enjoys a dynamic business and cultural environment.

The University enjoys a reputation for ground-breaking research and innovation. In 2014 the Research Excellence Framework (REF) ranked us fifth in the UK for research power. We are committed to delivering an outstanding teaching and learning experience; contributing to the social and economic success of local, national and international communities; producing the highest calibre graduates; and developing our staff to be amongst the very best of their peers.

To achieve our ambitious goals we aim to attract and retain the very best people to work across a range of academic disciplines and support functions. The University strives to make our

community a welcoming, caring and enthusiastic one, fuelling ambition with opportunities and support to help us all achieve our personal and professional goals.

The Faculty of Biology, Medicine and Health (FBMH)

The Faculty of Biology, Medicine and Health was created on 1 August 2016 when the Faculty of Life Sciences and the Faculty of Medical and Human Sciences bringing together a new, integrated structure to deliver a truly translational approach to the life sciences, ensuring smooth research pathways - from pure discovery science through to clinical application and patient care. With a total annual income of over £300 million, and over 3,000 members of staff, the new Faculty is comparable in size to a medium-sized UK university. Thirty undergraduate and 90 postgraduate programmes offer our 11,000 students opportunities to develop the skills and knowledge they need for a successful career.

The Faculty's matrix structure facilitates interdisciplinary working and enables us to learn from each other and share best practice; and our eight, strategic Research Domains help to articulate our research strengths, drive large-scale, collaborative research activities and strengthen relationships with our research and healthcare partners. The integration of discovery biology, clinical application and patient care within a single Faculty, particularly in a region with notable health inequality, provides us with a real opportunity to have a very significant and positive impact on people's lives.

Our strategic partnerships

The new Faculty has a number of key strategic partnerships that underpin its ambitions to develop ground-breaking research.

Working alongside six local NHS Trusts, the Faculty is a key member of the [Manchester Academic Health Science Centre \(MAHSC\)](#) - a federation of equal partners that unites leading healthcare providers with world-class academics and researchers. It aims to be a global centre for the delivery of applied health research and education and provide leadership for our local and regional health systems.

It also plays a leading role in [Health Innovation Manchester \(HInM\)](#), which was launched in September 2015, as part of the UK Government's decision to devolve health and social care responsibilities to Greater Manchester. HInM offers a unique opportunity to bring together health and social care, academic and life science related business resources across the region to deliver an innovative health ecosystem that can help accelerate innovation into our local health and social care systems, enhance our global scientific standing and act as a magnet for inward investment. Key partnerships in the charitable sector include Cancer Research UK; Diabetes UK; and the Wellcome Trust; and the Faculty has research and funding links to a number of commercial organisations including Unilever, AstraZeneca, GlaxoSmithKline and Boots, who will help us to bring new drugs and products to the market.

Working for the University of Manchester

The University of Manchester strives to make our community a welcoming, caring and enthusiastic one, fuelling ambition with opportunities and support to help us all achieve our personal and professional goals.

Our diverse job opportunities include an attractive [benefits package](#) with family-friendly policies that provide for flexible working. We care deeply about career and personal development, offering a structured induction programme for new staff, an annual performance and development review, staff training for all career stages and mentoring opportunities to support your career development. We have a genuine commitment to [equality of opportunity](#) for our staff and students, reflected in our Athena Swan Silver award, and are proud to employ a workforce that reflects the diverse community we serve.

As a global institution, situated at the heart of a lively, [culturally diverse city](#), we welcome applicants of all nationalities. To help international job applicants plan for life in the UK, we have put together some useful [information on passports and visas](#), travel to the UK, accommodation and a number of other practical considerations.

The Division of Pharmacy & Optometry

The Division of Pharmacy and Optometry (DPO) is dedicated to research across all parts of our discipline areas. Our Pharmacy research focuses on medicines, aiming to improve aspects of their design, development and use, as well as research covering the practice of pharmacy and the delivery of pharmaceutical services to patients and consumers. This is being advanced within a number of strategic research themes which encompass both the science and practice of pharmacy. Optometry research is also broadly based, covering fundamental aspects of vision science, corneal health, contact lenses and the ocular surface, low vision and the accommodation system.

Research within the DPO is funded by the Research Councils, Charities, EU, DoH/NIHR and Industry including the establishment of the AstraZeneca-funded (£1.5m) North West Centre for Advanced Drug Delivery. DPO is the home of the Centre for Applied Pharmacokinetic Research and Eurolens Research.

Project background

Pregnancy complications such as pre-eclampsia and fetal growth restriction are rooted in defective placentation. Whilst potential therapeutics have been identified that enhance placental function and improve fetal growth in animal models, no such treatments are available clinically. My laboratory has developed methods for affinity-based drug targeting, as a means of focusing drug action within the placenta and minimizing side effects in other maternal and fetal tissues. We have identified a series of “placental homing peptides” that bind to the surface of the placenta and to the uterine vasculature, but do not accumulate in other maternal or fetal tissues. We have exploited these peptides to create novel nanocarriers for targeted delivery of drugs to the placenta, and novel microRNA (miRNA)-based therapeutics. This project will involve the identification and manipulation of placental miRNAs that can be used as therapeutic targets to enhance placental function. Placental tissue will be transfected with targeted miRNA inhibitors or mimetics and the effects on different aspects of placental function will be assessed. The project will also involve preparation and testing of targeted liposomes containing siRNA to manipulate gene expression in human placental explants.

Overall Purpose of the Role

To conduct research, developing and testing targeted therapeutics for enhancement of placental function.

Key Responsibilities, Accountabilities or Duties:

- Take lead responsibility in the development of innovative targeted therapeutics and assessment of their ability to improve placental growth and function. The emphasis of the work will be (i) to transfect placental tissue with targeted miRNA inhibitors or mimetics, and determine their effect on gene expression and different aspects of placental function, and (ii) to prepare liposomal carrier structures decorated with tissue-specific homing peptides,

- develop protocols for optimal siRNA loading, and evaluate their ability to elicit gene knockdown and enhance placental function in vitro.
- Manage the use of specific research facilities in The Maternal and Fetal Health Research Centre and The Division of Pharmacy and Optometry. Ensure that effective use is made of them, manage or monitor research budgets and service contracts as required, manage the health and safety aspects associated to the facilities.
- Extend, transform and apply knowledge acquired from scholarship to research and appropriate external activities. Develop new concepts and ideas to extend intellectual understanding and develop ideas for application of research outcomes.
- Prepare and present regular reports on research progress.
- Provide clear and timely written work, producing reports and publishing in high quality publications, and communicate verbally as required with other members of the University and with collaborating partners. This may include presentations at national or international level.
- Collaborate actively and effectively within the research team and the wider project collaborations to complete research projects, advance their medical translation and contribute to IP consolidation, as required.
- Develop productive working relationships with other members of staff and participate in and develop external networks.
- Maintain expertise in scientific developments relevant to the objectives of the Faculty of Biology, Medicine and Health. Provide relevant expert advice within the Faculty and to the project partners.
- Contribute to disseminating research information in an appropriate manner, through: i) submission of abstracts at national and international conferences and ii) publications in relevant journals;
- Contribute to appropriate grant proposal preparation.
- Have a good standard of record keeping.
- Assist in the laboratory supervision of undergraduate and postgraduate students and junior members of staff, if and when requested.
- Perform routine laboratory tasks and duties including reagent ordering, COSHH assessment and safety training.
- Assist in the collection and storage of human tissue samples, in accordance with current Human Tissue Act guidelines and local ethics committee approval.
- Contribute to the delivery of undergraduate and postgraduate programmes within the Division of Pharmacy and Optometry, The Maternal and Fetal Health Research Centre and the Faculty of Biology, Medicine and Health Sciences.
- To act at all times in accordance with the University's policies and procedures relating to Health and Safety, Equal Opportunities, and all other policies and procedures that apply to the post.
- To understand and engage with the University's social responsibility agenda and contribute, as appropriate, to making a positive difference to society through our full range of teaching, research, engagement and operational activities.
- To undertake training and development activities as appropriate.
- Any other duties appropriate to the post and grade that may be reasonably requested.

PERSON SPECIFICATION

The appointed person will be self-motivated, will have a proven track record of reproductive biology research, and significant expertise in tissue transfection or gene manipulation in placental or uterine tissues.

Essential Knowledge, Skills, Experience and Qualifications:

- The candidate will hold a PhD or in reproductive biology or a related biomedical discipline, or be expected to do so, or at least have submitted their PhD thesis by the time of commencing their post
- The candidate must have significant molecular and cell biology experience within the field of reproductive biology. Specifically, it is required that they will have experience in the following fields:
 - Extensive expertise in tissue transfection, gene knockdown and RT-qPCR
 - Proficiency in human tissue collection, dissection and culture.
 - Experience of fluorescence and bright field microscopy, immunohistochemistry and ELISA or related biochemical assays.
 - The study of uteroplacental biology, trophoblast turnover, oxidative stress and inflammation.
 - An understanding of the pathophysiology of placental dysfunction
- The ability to work independently and as a part of a multi-disciplinary team that comprise physical and biomedical scientists
- The ability to communicate effectively at all levels
- Computer literate with a specific knowledge of graphic/imaging software.
- Excellent organisational and time-management skills, including the ability to deliver timely and high quality outputs.
- The ability to develop effective working relationships with all levels of staff, students and external contacts
- The ability to work under pressure and maintain a high degree of accuracy.
- The ability to work in compliance with relevant Health and Safety regulation, the Data Protection Act and University policy legislation and regulations, e.g. the Human Tissue Act, Equality & Diversity, etc.

Desirable Knowledge, Skills, Experience and Qualifications:

- Experience of liposome synthesis, characterisation and use of nanoparticle-based formulations
- Evidence of a developing track record in publishing and dissemination of high quality publications in peer-reviewed journals.
- Record of supervision of postgraduate students.

- Previous experience of applying for or managing externally funded research grants

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