**Department of Respiratory Sciences PhD studentship Project information**

**Funding Source:** Self-Funded

**Proposed project start date:** January 2025

**Closing date for applications:** Open

**Eligibility:** UK/EU/International

**Department/School:** Respiratory Sciences

**Supervisors:** Dr Enya Daynes ([ed207@leicester.ac.uk](mailto:ed207@leicester.ac.uk)) Dr Laura Grey ([lg48@leicester.ac.uk](mailto:lg48@leicester.ac.uk)), Professor Sally Singh ([sally.singh@uhl-tr.nhs.uk](mailto:sally.singh@uhl-tr.nhs.uk))

**Project Title:** Exercise and activity phenotypes in respiratory disease  

**Project Description (max 700 words):**

Aim: To explore the phenotypes in relation to exercise and physical activity for individuals with respiratory disease.

Background: Those living with respiratory disease have increased sedentary time, reduced physical activity and reduced exercise capacity1. Individuals with respiratory disease report that they have reduced engagement in activities of daily living and loss of independence. This is accelerated by inactivity as a result of breathlessness caused by their condition, though other factors such as smoking, repeat exacerbations and length of diagnosis may also play a role in deconditioning2. Research has demonstrated potential categories of physical activity (can do, do do, can’t do, do do, can do, don’t do and can’t do, don’t do) though these are not supported by disease biomarkers3. This study will aim to phenotype individuals with respiratory disease to understand the impact of physical inactivity and exercise capacity.

Research Plan: This project will utilize the EXCEED study database to explore phenotypes for physical activity and exercise capacity, within respiratory disease4. This is a longitudinal study with a large cohort of people in Leicestershire. Stage I will be a genome-wide association study utilizing the EXCEED database (inclusive of environmental and lifestyle factors), in particular those with respiratory disease (with and without multiple long-term conditions), and age matched health controls (smokers, ex-smokers and never-smokers) in order to determine characteristics that may contribute to physical inactivity, and respiratory symptoms. Stage II will invite those with respiratory disease and healthy individuals (smokers, ex-smokers and never-smokers) to perform measures of exercise capacity such as Cardiopulmonary Exercise Testing, and Incremental Shuttle Walking Test, alongside some disease specific/health related quality of life questionnaires, DEXA scans, and physical activity monitoring. Stage III will provide rehabilitation to individuals with respiratory disease and assess the associations between genomes and rehabilitation outcomes. Further analysis will assess the impact and influence of ethnicity, throughout all phases.

Expected outcomes and impact: This study will present phenotypes of physical activity/exercise capacity which could lead to personalisation of exercise and physical activity interventions for those with respiratory disease. Results from this work will have clinical relevance and is in line with the BRC aims and NHS long term plan, and as a result could influence national guidance.

**References:**

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2. Mioxham J, Jolley C. Breathlessness, fatigue and the respiratory muscles. Clin Med (Lond). 2009 Oct;9(5):448-52. doi: 10.7861/clinmedicine.9-5-448. PMID: 19886106; PMCID: PMC4953455.

3. Vaes AW, Spruit MA, Koolen EH, Antons JC, de Man M, Djamin RS, van Hees HWH, van 't Hul AJ. "Can Do, Do Do" Quadrants and 6-Year All-Cause Mortality in Patients With COPD. Chest. 2022 Jun;161(6):1494-1504. doi: 10.1016/j.chest.2021.12.657. Epub 2022 Jan 11. PMID: 35026297.

4. John C, Reeve NF, Free RC, Williams AT, Ntalla I, Farmaki AE, Bethea J, Barton LM, Shrine N, Batini C, Packer R, Terry S, Hargadon B, Wang Q, Melbourne CA, Adams EL, Bee CE, Harrington K, Miola J, Brunskill NJ, Brightling CE, Barwell J, Wallace SE, Hsu R, Shepherd DJ, Hollox EJ, Wain LV, Tobin MD. Cohort profile: Extended Cohort for E-health, Environment and DNA (EXCEED). Int J Epidemiol. 2019 Oct 1;48(5):1734. doi: 10.1093/ije/dyz175. Erratum for: Int J Epidemiol. 2019 Jun 1;48(3):678-679j. PMID: 31365084; PMCID: PMC6857747.

**Funding details:**

There is no associated funding with this project.

The PhD will last approximately 3 years Full Time with an additional one year for writing up.

Part Time options available.

Fee Band 6 (£27,000) for international applicants. No international fee waiver available

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**To apply please refer to** [**https://le.ac.uk/study/research-degrees/research-subjects/respiratory-sciences**](https://le.ac.uk/study/research-degrees/research-subjects/respiratory-sciences)

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