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

**Funding Source:** Self-Funded

**Proposed project start date:** All year round

**Closing date for applications:** Open ended

**Eligibility:** UK/EU/International

**Department/School:** Respiratory Sciences

**Supervisors:** Dr Hasan Yesilkaya [hy3@leicester.ac.uk](mailto:hy3@leicester.ac.uk)

**Project Title:** How does stress effect progression of infection?

**Project Description:**

Bacteria respond to their host by detecting changes in temperature, oxygen saturation, the availability of nutrients and host stress. Catecholamine (CA) stress hormones, including dopamine (Dop), epinephrine (Epi), and norepinephrine (NE), are among the most well-known host signals. Our ground-breaking research demonstrated that important human pathogen Streptococcus pneumoniae (Spn) treated with NE effectively moved from the nasopharynx into the lungs, enhancing its potential for pathogenicity. In other words, stress hormone treatment rendered a harmless microbe to an invasive pathogen. We do not know currently what causes this switch. Building on our previous research, we will investigate the theory that, in the respiratory tract's environmental conditions, stress hormone detection via a complex genetic network causes pneumococcal translocation from the nasopharynx into the lungs. The first goal of this study is to ascertain how stress hormone responses interact with chemical and nutritional elements to facilitate the transition from a commensal to an invasive phenotype. 2.) Determine the regulatory and effector mechanisms that are receptive to stress hormones. 3.) Assess how stress hormones affect the host's reaction to Spn and ascertain the role of the pneumococcal effector and regulatory mechanisms in vivo.

**References:**

Alghofaili F, Najmuldeen H, Kareem BO, Shlla B, Fernandes VE, Danielsen M, Ketley JM, Freestone P, Yesilkaya H. Host Stress Signals Stimulate Pneumococcal Transition from Colonization to Dissemination into the Lungs. mBio. 2021 Dec 21;12(6):e0256921.

**Tuition fee details:** Self-funded, no international fee waiver available, Fee Band 26 (£38,300)

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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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