



Title of PhD project	Development of a transgenic mouse model for preclinical studies of therapeutic testing of mitochondrial disorders	
Supervisor	Dr Christopher Carroll	SGUL
Co-Supervisor	Dr Alan Pittman	SGUL
Brief description of project	<p>Due to the technological advancements in large-scale quantitative methodologies colloquially referred to as omics we are on the cusp being able to disentangle whole organism physiology and how interactions between different tissues contribute to health and disease.</p> <p>This project provides the student a ringside seat to utilize these technologies in the context of uncovering the pathological basis of inherited metabolic diseases in a preclinical disease model. The work will address an unmet need to facilitate the discovery of new therapies by providing insights into potential new therapeutic targets and a model to test the effectiveness of those therapies in. To achieve this goal the student will use bioinformatics approaches on a combination of different large sequencing and mass spectrometry -based omics data sets as well as perform experiments in the lab to confirm and deepen the insights derived from the omics.</p> <p>The student will be supervised by an interdisciplinary team at SGUL.</p>	
Skills we expect a student to develop/acquire whilst pursuing this project	<ul style="list-style-type: none"> • Handling large omics data sets. • Analysis of next-gen sequencing and mass spectrometry data. • Bioinformatics skills in R and Linux. • Molecular biology laboratory techniques. • Develop understanding of whole organism physiology and metabolism and interpretation of complex data to elucidate disease mechanisms. 	
Particular <u>prior</u> educational requirements for a student undertaking this project	BSc(Hons), minimum of 2:1	
Project key words	Omics Metabolism	

	Inherited metabolic disease Transgenics
Possible under 1+4 route? Master's options identified.	Yes SGUL – MRes/MSc Translational Medicine SGUL – MRes Biomedical Science
MRC Core Skills developed through this project	Quantitative skills Whole organism physiology
MRC LID themes	Translational and Implementation Research
Further reading	Mouse models for mitochondrial diseases Mitochondrial DNA Replication Defects Disturb Cellular dNTP Pools and Remodel One-Carbon Metabolism