

## Targeting mitochondrial dysfunction in diabetic kidney disease

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| Project duration:                   | 9-10 months  |
| Description:                        | <p><b>Rationale:</b> Diabetic individuals with kidney disease make up the greatest proportion of persons requiring a kidney transplant or dialysis in Australia. Susceptibility to kidney disease in diabetes is not well understood, but previous studies have highlighted dysfunction of the power stations of the cells (mitochondria) as a potential mediator. In this project, we aim to better understand how dysfunction in mitochondria can contribute to kidney disease in diabetes. Further, we will also examine if novel medicine (KH176) that can improve the function of mitochondria in other human conditions, can alleviate kidney disease in a mouse model of diabetes. The intent of this research is to test the novel therapy KH176 and understand its protective mechanisms allowing for translation of this research to patients with diabetes and kidney disease. In addition to kidney function this project will also closely examine how KH176 affects blood glucose control.</p> <p><b>Hypothesis:</b> Improving the function of mitochondria using the novel medicine KH176 will prevent the onset of diabetic kidney disease.</p> <p><b>Aim1:</b> To examine if KH176 alters kidney function and blood glucose homeostasis in a mouse model of type 1 diabetes.</p> <p><b>Aim2:</b> To test if protection against diabetic kidney disease is via improvement in mitochondrial dysfunction.</p> <p><b>Approach:</b> Candidates will gain experience in animal models of diabetes, therapeutic interventions, testing kidney function, testing blood glucose levels. PET/CT imagine will also be used.</p> |
| Expected outcomes and deliverables: | <p>Applicant will gain experience in managing diabetes and administering therapy. Measurement of kidney function, structural damage and glucose control. Cutting edge PET/CT imagine. This will help the applicant gain not only valuable laboratory experience but also a greater understanding of mitochondrial function and kidney metabolism. Co-authorship on a publication is also likely, if the experiments are successfully executed.</p> <p>An oral presentation to our research team describing the experiments and results will be encouraged. As part of the Honours degree, the completion of any compulsory course work and a thesis in line with the guidelines of UQ are expected and used to assess this research degree.</p>  |

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| Suitable for:       | Students who have completed their primary undergraduate degree and have are eligible for the Honours Program. A student who is keen to learn new skills in the laboratory and who will take a personal interest in the project. A student who has studied courses in biomedicine, biology or biochemistry, with some practical component to the courses would be most suited. |
| Primary Supervisor: | Professor Josephine M Forbes; Mitchell Sullivan (associate)   |
| Further info:       | e: <a href="mailto:Josephine.forbes@mater.uq.edu.au">Josephine.forbes@mater.uq.edu.au</a>   |