**Elucidating the effect and role of hypoxia on differentiation of stem cells to kidney progenitors**

Every year, 2.6 million people worldwide receive treatment for kidney disease, while around another 2.2 million people die prematurely, unable to access treatment. Kidney transplants are in short supply and therapies that prevent the progression of chronic kidney disease to kidney failure are therefore required. Stem cells, which are cells that have the capability of being transformed to any cell type of the body, will be directed to form kidney cells and 3D mini-kidneys in the laboratory. They can be used to model kidney disease to test treatments as well as used to identify targets for future therapies. This research project hopes to investigate what role oxygen levels play in the development and growth of the kidney cells and mini-kidneys. It is thought that it will enhance their efficiency and their development and I hope to determine how and why this occurs, with a view to making better models of human kidney development and disease in order to create new therapies. It is known that stem cells naturally reside at low oxygen levels, known as the 'stem cell niche' but the reasons why this is beneficial is not fully understood and this will be explored in this project.

The project will be carried out over a period of two years. Experiments will be organised to focus on kidneys cells in the first year and mini-kidneys in the second year. Ultimately, it is anticipated that the findings from this research will help to improve both potential stem cell based therapies for kidney failure and the testing of potential treatments.