Project proposal template – Faculty studentships Summer 2014

Project title	Dietary polyphenols as novel treatments for polycystic kidney disease	*Director of Study*	Dr Mark Carew
Second Supervisor	Dr Liz Opara	*School*	Pharmacy and Chem
Other members of supervisory team	Professor Deborah Baines, St George's University of London	*Any requirements from applicant (eg degree in specific subject area)*	Degree in a biomedical subject, physiology or pharmacology desirable

Project summary

(max 1,000 characters)

Polycystic kidney disease (PKD) is a commonly inherited disease (12.5 million people worldwide) characterised by the growth of fluid-filled cysts in the kidney. There is no treatment and the only clinical options are a kidney transplant or dialysis.

We recently reported that naringenin, a natural product, reduced the growth of kidney cysts by a mechanism involving the ion channel polycystin-2 (Waheed *et al* 2014 *Br J Pharmacol* **171**:2659-70).

Naringenin may admit Ca^{2+} through polycystin-2 and reduce cAMP-mediated cell proliferation and fluid secretion. Naringenin may also target other signalling pathways including AMPK, mTOR and the cell cycle.

The aim of the project is to determine the effect of naringenin and related polyphenols (resveratrol, curcumin) on kidney cyst growth, and the underlying cell signalling pathways, using the following methods:

- growth of Madin Darby Canine Kidney cysts in collagen gels
- cell proliferation assays
- measurement of intracellular Ca^{2+} by fluorescent probes
- measurement of intracellular cAMP and IP_3 production
- detection of AMPK and mTOR activity by Western blot
- cell cycle analysis by fluorescence activated cell sorting