Project proposal template – Faculty studentships Summer 2014

Project title	Formulation and characterisation of injectable anti-retroviral nanoparticles for Human	*Director of Study*	Dr Dhaya Perumal
Second Supervisor	Dr Hossein Asrafi	*School*	Pharmacy and Chem
Other members of supervisory team	Professor Raid Alany	*Any requirements from applicant (eg degree in specific subject area)*	

Project summary

(max 1,000 characters)

About 34 million people worldwide are infected with HIV. Currently, no cure exists but highly active antiretroviral therapy (HAART) remains the most effective means of delaying progression to AIDS. Twenty seven drugs from different classes act in various stages of the viral life cycle to block reverse transcriptase, integrase, protease, co-receptor binding and fusion to host cells. The inability of HAART drugs to reach HIV reservoirs in the body, low oral bioavailability, short half-life and reduced patient compliance all contribute to the development of resistance. Recently, it has been shown that injection of long-acting HIV drugs can completely prevent infection of monkeys[1].

This study combines pharmaceutics and cell biology and proposes to continue our current work to explore the formulation and characterisation of injectable nanoparticulate dosage forms that specifically target immune cells infected by HIV. These nanoparticles engineered with ligands will, due to their nano-size, allow crossing of biological barriers whilst simultaneously protecting the drug molecule, target specific cells, increase cellular uptake and permeation to reach efficacious concentrations where most required from external constraints. The strategy will also be tested in a prevention of HIV infection model.