NANYANG TECHNOLOGICAL UNIVERSITY

School of Biological Sciences

Reg. No. 200604393R

Research Theme: Virology/bioengineering

Research Project Title: Evaluation of 3D cell culture systems for use as bioreactors in virus production for vaccine development and isolation of viruses from clinical specimens

Principal Investigator/Supervisor: A/Prof Richard Sugrue

Co-supervisor/ Collaborator(s) (if any): A/Prof Wang Dong-an (SCBE), BH Tan (DSO) and Dr Tan Ban Hock (SGH)

Project Description

a) Background

With some exceptions tissue cell culture is the only method for virus cultivation, however there are currently major challenges in the large scale production of virus vaccines. Although for some viruses other non-tissue culture based systems have been traditionally used for vaccine production, there are limitations when using these systems. For example in the case of influenza virus embryonated chicken eggs are the traditional system used to produce vaccine stocks. However, there are some disadvantages to a reliance on egg-based vaccine. For example in a vaccine surge (e.g. in a pandemic) the limited availability of eggs will reduce the number of doses that can be produced. Therefore in general virus production using cell culture based systems is now becoming a system of choice, but there are currently some obstacles to virus production in cell culture and two of these are highlighted which included e.g. low virus yield. The aim of this project will be to use bioengineering principles/techniques in tissue culture to produce 3D cell culture-based bioreactors for producing viruses. The viruses to be examined will be influenza virus, respiratory syncytial virus and human metapneumovirus; viruses that we have extensive experience with in 2D cell culture. These are important respiratory virus pathogens which are between then responsible for over 700,000 deaths each year, and which can be difficult to propagate and produce high virus yields using the current in monolayer cell culture systems.

b) Proposed work

Cell biology, biochemistry, bioengineering techniques and basic virology methods will be employed.

Supervisor contact:

If you have questions regarding this project, please email the Principal Investigator:

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SBS contact and how to apply:

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Please apply at the following: http://admissions.ntu.edu.sg/graduate/R-Programs/R-WhenYouApply/Pages/R-ApplyOnline.aspx

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