Title: Detecting and characterising emerging viruses of the Asia-Pacific region

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Project description: Emerging viral diseases threaten the public health, environment, and economies of affected countries. They are caused by either new viruses that have not been previously recognized or known viruses which are increasing, or threaten to increase, in incidence or geographic range. My laboratory's research interests are focused on the detection and characterization of these pathogens. The projects available for the 2008 honours program are:

(1) Developing a novel PCR-based technology (*MassTag PCR*) for detection and discovery of emerging viruses. Recent outbreaks of emerging diseases in regions neighbouring Australia highlight the need for effective measures of disease detection and surveillance. Many of the agents causing these diseases can cause encephalitis following human infection and, in such cases, are rarely diagnosed following infection. Many also fail to be identified during surveillance activities. This project aims to develop a novel molecular diagnostic technique (MassTag PCR) for the rapid, sensitive and simultaneous detection of multiple microbial gene sequences of pathogens.

(2) Investigating the cellular entry pathways of group A human enteroviruses (HEV-A). HEV-As have caused recent epidemics of hand-foot-and-mouth disease and neurological disease in small children in SE Asia and Australia. Although the cell entry pathways of other HEV groups have been characterized, to date, there are no published reports of cellular attachment receptors and entry mechanisms for HEV-As. Cellular receptors have a fundamental role in virus infection and are primary determinants of virus tissue tropism and pathogenesis. This project will focus on the ability of HEV-As to utilize cell surface carbohydrates for attachment and entry of cells.

Note: Honours candidates at the Australian Biosecurity CRC are eligible to apply for an honours scholarship for 2008.