Michael Smith Laboratories

Wilfred Jefferies

Professor

CONTACT

Office Phone Number  604-827-5167
Lab Phone Number  604-822-2006
Email Addresses  wilf@msl.ubc.ca
UBC Mailing Address  2185 East Mall Vancouver, British Columbia Canada V6T 1Z4

OFFICE

Building  MSL
Room Number  215

LAB

Name  Jefferies Lab
Building  MSL
Room Number  255

PROFESSIONAL

Associated Departments  Medical Genetics
Microbiology & Immunology
Zoology (Associate)


Research Area  Iron is a requirement of living cells. Examining how mammalian cells acquire iron is fundamentally important for understanding how cells proliferate and survive. A particularly interesting problem is how cells within the brain acquire iron. The blood brain barrier (BBB) impedes the passive transport of molecules into the brain. We have developed systems to examine the functions of iron transport molecules expressed at the brain endothelium which form the BBB. We hope this work will allow us to create better methods for drug delivery to the site of neuropathologies. Recent work has
allowed us to identify iron transport molecules elevated in certain diseases such as Alzheimer's. Work is underway to determine the involvement of these molecules in the disease process. Viruses cause a large number of diseases in man and our goal is to thoroughly understand how viruses become recognized by host lymphocytes. It is now clear that an initial event in host recognition of viruses is the breakdown of viral proteins into small subunits or peptides prior to the triggering of T lymphocytes. We are attempting to understand how virus proteins are broken down and become bound to host viral peptide receptors called major histocompatibility complex (MHC) molecules. It is clear from our work that the different characteristics of different viruses greatly influence the efficiency and requirements for protein degradation, recruitment and presentation of vital peptides. We hope that by understanding the rules of antigen processing and presentation we will be in a position to modulate immune responses against particular viruses and thereby limit viral pathogenesis in man. The human adenoviruses are a diverse group which cause various ailments in man. One characteristic of adenoviruses is the ability to become persistent and latent within the host. One barrier which the adenovirus must overcome to become persistent is the evasion of the host immune system which would otherwise remove the virally infected cells. The adenovirus accomplishes this by expressing specific proteins which interfere with the function of the host immune system. One such protein, termed E3/19K, specifically binds to MHC molecules in infected cells and inhibits them from presenting viral peptides to host T lymphocytes. It is clear from our work that a highly regulated set of events allow mature MHC molecules to be expressed at the plasma membrane and we are intrigued by the fact that the E3/19K protein is able to decrease the egress of MHC molecules from the endoplasmic reticulum to the plasma membrane. We hope to develop a molecular understanding of how to overcome adenoviral persistence.

Source URL: http://www.msl.ubc.ca/faculty/jefferies