Cell Suicide in Cancer and Autoimmunity

My lab is interested in the natural cell death process known as apoptosis. Apoptosis can be viewed as a form of cellular suicide, as the dying cell actively switches on a set of enzymes (called caspases) that coordinate the death of the cell. Apoptosis is used to replace aged, defective, infected and injured cells in the body. Apoptosis is also critical for fine-tuning the composition of the immune system as well as the brain.

Literally billions of cells in the human body die by apoptosis on a daily basis and these are replaced by cell division. Thus, apoptosis is a natural healing mechanism in the body and is essential for general health, to fight infection and suppress the development of cancer.

Understanding how apoptosis ‘works’ at a molecular level is helping to deepen our understanding of many fundamental biological processes and is resulting in new ways of treating conditions, such as cancer and neurodegenerative disease, where either too few or too many cells die.

At present my laboratory is focused on a number of different problems, all revolving around cell death control. We are particularly interested in how apoptosis, as well as other modes of cell death, influence the activation of the human immune system. We have a particular interest in how cell death-related proteases promote the activation or inactivation of IL-1 family cytokines.

We are actively involved in translating our research findings to develop therapies for inflammatory diseases and cancer.

Recent Publications