The role of insulin-like growth factor-II receptor in cancer.

Host School/Institute: Kolling Institute of Medical Research, Royal North Shore Hospital, Northern Clinical School
Project Code: NCS9

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Description of Project:

Our group is interested in the functions of the insulin-like growth factor II receptor (IGF-IIR), especially in breast cancer. The IGF-IIR is a large multi-functional protein which is best known for its role in targeting excess IGF-II for degradation and thereby preventing overgrowth of tissues. A number of studies by us and other researchers have indicated that the IGF-IIR has an important role in cancer, acting as a tumour suppressor, but the mechanism behind this is poorly understood.
We are currently investigating the effect of increased expression levels of the IGF-IIR in breast cancer cells which leads to changes in the cell's ability to proliferate, migrate and invade extracellular matrix (ECM) - all key functions in the growth and metastasis of cancer in the body. To identify the molecular changes taking place when IGF-IIR levels are manipulated, we have carried out microarray expression profiling and identified genes that are differentially expressed in response to over-expression of IGF-IIR.
The aim of this summer student project is to validate some of the differentially expressed genes identified by microarray analysis, and then select promising candidate genes to investigate for effects on cell function. Validation of genes of interest will involve determining mRNA expression levels by real-time PCR and protein levels by SDS-PAGE gel electrophoresis and Western blotting. Selected candidates will then be further investigated by knocking-down their expression in cancer cells using siRNA techniques and studying the effect on cell phenotype such as growth and migration.
In summary, this project will identify proteins that mediate effects of the IGF-IIR and help us understand the mechanism by which IGF-IIR acts as a tumour suppressor.

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