



Daniel Chung, M.D.

Dr. Daniel Chung is using proteomics to study carcinoid and pancreatic neuroendocrine tumors. Proteomics is a technique which enables the highly efficient analysis of proteins expressed by cells. Dr. Chung's laboratory has been able to analyze the entire proteome—every protein expressed by a cell—of various neuroendocrine tumors.

Specifically, Dr. Chung is analyzing and comparing the proteomes of early stage and malignant stage neuroendocrine tumors. By comparing the proteomes of these tumor types, Dr. Chung can detect proteins that are expressed differently in later stage malignant tumors. These specific proteins are likely to contribute to the aggressive nature of malignant tumors. Identification of these proteins will allow Dr. Chung to study how these proteins affect tumor growth and may reveal possible targets for new therapies for carcinoid and neuroendocrine tumors.

Using this approach, Dr. Chung's laboratory has already identified a number of proteins that are expressed differently in malignant neuroendocrine tumors. Many of these are proteins that play important roles in regulation of cell growth and angiogenesis, the process by which tumor cells create their own blood supply. Dr. Chung plans to study whether these proteins could play important roles in neuroendocrine tumor formation.

Dr. Chung has discovered one protein in particular that is highly expressed in malignant neuroendocrine tumor cells. This protein is a member of the homeobox family of proteins (a family of proteins involved in the regulation of development) and is known to activate a signaling pathway that is important in many cancers. When Dr. Chung's laboratory experimentally expressed this protein in a neuroendocrine tumor cell line, they observed that this protein increased tumor cell growth.

Dr. Chung plans to continue to study whether this protein and other candidate proteins identified through his proteomic approach could have important roles in tumor growth that could be targeted for the possible treatment of carcinoid and other neuroendocrine tumors.

Recent Publications:

Duerr EM and Chung DC. Molecular genetics of neuroendocrine tumors. *Best Pract Res Clin Endocrinol Metab.* 2007 21:1-14.

Chung DC. Cyclin D1 in human neuroendocrine: tumorigenesis. *Ann N Y Acad Sci.* 2004 1014:209-217.