

Cancer research the science behind the medicine

He grimaces when you call him a detective, but to the non-scientist, that's what springs to mind when speaking with **Dr. Torsten Nielsen**.

Based at Vancouver General Hospital, Dr. Nielsen is a clinician-researcher with the Genetic Pathology Evaluation Centre at the Vancouver Coastal Health Research Institute. (His other many titles include assistant professor in the Department of Pathology and Laboratory Medicine at the University of British Columbia.) As an MD as well as a scientist, he is driven to understand why people get sick with certain diseases. In other words, he works to discover the "science" behind the medicine. He also appreciates how important it is for his work to move quickly from the scientist's bench to the patient's bedside, providing the maximum amount of impact for better patient care.

One of Dr. Nielsen's key projects involves identifying diagnostic tools and targeted therapies for synovial sarcoma, a rare and difficult to diagnose cancer that strikes young adults. It's fatal in almost half of the cases.

As one of only three people in B.C. with special training to recognize and diagnose sarcomas, he has put this expertise to use with microarray technology, glass slides that contain thousands of DNA spots to identify genes which cause cancer, or hundreds of tissue samples to test if new ways to identify cancer will work in the hospital diagnostic lab. It's somewhat like looking for a needle in a haystack, but Dr. Nielsen and his team discovered certain genes in the synovial sarcoma



samples were "turned on" when they weren't supposed to be. This discovery allowed them to develop an inexpensive diagnostic test for the illness.

The test allows an accurate diagnosis to be made from a simple needle biopsy, reducing the need for large surgical biopsies that are difficult on patients and expensive for the health care system. A diagnosis can now be made in two days instead of two weeks, and costs twenty, instead of several hundred, dollars. Pathology labs and community hospitals around the province will now also be able to make a diagnosis.

Dr. Nielsen pushed further, testing drugs that will work on the genes the researchers identified, shutting them

off when they were switched on. He has found two agents not previously tried against synovial sarcoma that showed promise in the petri dish and in mouse models. The team is currently seeking the optimal drug combination and working toward developing human clinical trials. Their hope is to not only find a treatment strategy that will work for synovial sarcoma, but one that can also be applied on other related types of cancer.

Dr. Nielsen and his team have received funding for this project from the Terry Fox Foundation through the National Cancer Institute of Canada. He collaborates with Stanford University in California, the Cleveland Clinic in Ohio, and Memorial Sloan-Kettering Cancer Center in New York.

What is synovial sarcoma?

A type of soft tissue cancer of the muscle, fat, or other supporting tissue of the body. Most patients are between 15 and 35 years of age.

About 50 percent of synovial sarcomas develop in the legs, especially the knees. The second most common location is the arms. Less frequently, the disease develops in the trunk, head and neck region, or the abdomen.

With aggressive surgery and radiation, some patients are cured, but in roughly 50 per cent of the cases, the cancer metastasizes and is then generally fatal.