

Bright, Young Minds at Lawson Fight Breast Cancer

The future of breast cancer treatment may involve targeting cancerous stem-like cells (cancer stem cells). These cancer stem cells have recently been identified as the cells that initiate and maintain tumor growth. The same cells seem to play a key role in breast cancer metastasis. What is more, these cells may be resistant to both radiation and chemotherapy. Alysha Croker, a trainee at Lawson Health Research Institute (Lawson) and a graduate student at the Schulich School of Medicine & Dentistry at The University of Western Ontario (Western), has been awarded a fellowship from the Canadian Breast Cancer Foundation (CBCF) to investigate the behaviour and response of cancer stem cells to commonly used chemotherapy agents and to radiation.

Alysha started at Lawson doing a 4th year undergraduate thesis where she looked at the role of cancer stem cells on breast cancer metastasis. Under the guidance of Dr. Alison Allan, scientist at the London Regional Cancer Program at Lawson, she was able to successfully demonstrate that commonly used breast cancer cell lines contain subpopulations of cells with stem cell properties, and that these cells contribute functionally to breast cancer metastasis. The cancer stem cells were able to grow, adhere, migrate, and survive under stressful conditions better than the non-stem-like cancer cells. These steps are very important in the metastatic process. Finally, in collaboration with Dr. David Hess at the Robarts Research Institute at The University of Western Ontario, Alysha used a specialized stem cell biology mouse model to look at how well cells could metastasize to various organs in the mouse. She found that the cancer stem cells could spread throughout the mice much better than the non-stem-like cancer cell population.

Funded by the CBCF, Alysha is currently sorting breast cancer cells into cancer stem cells and non-cancer stem cell populations in order to test how resistant the different populations are to chemotherapy and radiation. She's been able to find that the cancer stem cell population has a higher expression of drug resistance proteins, which are involved in protecting cells from cancer treatment drugs and radiation therapy. These preliminary results suggest that the tumor initiating population could also be resistant to chemotherapy and radiation therapy. "We have found the cells that we want to target, which is a huge step forward," says Alysha. "Now all we need to do is to find a way to kill those cells."

Breast cancer is a leading cause of death in women, primarily due to ineffective treatment of metastasis. Through pre-clinical studies such as Alysha's, scientists are looking at ways to determine the role cancer stem cells play in metastatic behaviour and resistance to current cancer therapies in hopes of better understanding the biology of the metastatic process.

"The Canadian Breast Cancer Foundation is leading the way when it comes to funding early-



career investigators,” says Sharon Wood, CEO of the Foundation’s Ontario Region. “Alysha Croker is making important contributions to our knowledge of breast cancer at this early stage in her career, and we are proud to be supporting her as a fellow so that she can continue to break new ground.”

Media Contact:

Melissa Beilhartz, Communications Consultant

Lawson Health Research Institute

519.646.6100, ext. 65516

Melissa.beilhartz@lawsonresearch.com

www.lawsonresearch.com