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Discovering novel mechanisms of breast cancer brain metastasis using high throughput mass spectrometry-based technology

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Complex networks of genes and the influence of environmental factors drive the progression of human diseases such as Cancer. To understand the complexity of breast cancer metastasis in hopes of identifying targets and developing drugs against brain metastasis, we utilized large-scale, high-throughput technologies such as mass-spectrometry-based proteomics to elucidate the tumor and environmental factors and interactions among and between these factors, and to establish how these factors induce changes in signaling networks that in turn lead to breast cancer brain metastasis. The explosion of large-scale, high-throughput technologies in the biological sciences allows researchers to take a more systems biology approach to study complex signaling events in human diseases. In our laboratory, we applied the technology of shotgun proteomics to study the tissue specificity of breast cancer metastasis and have made the discovery of new therapeutic targets, which can be explored to impact the survival of patients with advanced breast cancer metastasis.

Biography

Dr. Chen received her Ph.D. degree from the Department of Molecular Pathology at the University of California, San Diego in 2002. Then, she pursued her postdoctoral training at the Scripps Research Institute in Dr. John Yates' laboratory. Currently, she is a faculty member in the Department of Pharmacological Sciences and the Scientific Director of the Proteomics Center at the Stony Brook University. Using the cutting-edge mass spectrometry-based proteomic techniques, her current research focuses on elucidating mechanisms of tissue-specific breast cancer metastasis and identifying protein targets to eradicate the growth of distal breast cancer metastasis. She is also developing new proteomics techniques to perform biomarker discovery using archived tissues from human patients.