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Nitin Telang

Palindrome Liaisons Consultants, USA

Efficacy of Chinese herbs for secondary prevention/therapy of breast cancer: Preclinical leads

Rationale: Progression of advanced stage metastatic breast cancer represents a major cause of mortality in women. The American Cancer Society has projected 281,550 new cases of female breast cancer and 43,600 cancer-related deaths in 2022. Conventional chemo-endocrine therapy or small molecule-based targeted therapy constitute mainstream treatment options. These treatment strategies are associated with systemic toxicity and spontaneous/acquired therapy resistance. These limitations promote the progression of therapy-resistant breast cancer. Chinese herbs, mostly nutritional in nature, function as anti-estrogens, anti-inflammatory, and immune-modulatory agents. The herbs represent major constituents of herbal formulations that are used in traditional Chinese medicine for estrogen-related issues for breast cancer in women. Because of their low systemic toxicity and documented efficacy in patients, Chinese herbs may represent testable alternatives against therapy-resistant breast cancer.

Cellular Models: Human mammary carcinoma-derived MCF-7 cells and MDA-MB-231 cells represented models for clinical Luminal A and triple-negative breast cancer subtypes, respectively. Status of cell cycle progression, cellular apoptosis, estrogen metabolism, retinoblastoma protein (RB), phosphoinositide 3-kinase (PI3K), protein kinase B (PKB), and RAS signaling pathways represent quantitative endpoints for mechanistic leads for the efficacy of herbal extracts.

Research Outcome: The breast carcinoma-derived cellular models exhibit hyper-proliferation, downregulated cellular apoptosis, increased cancer risk, altered estrogen metabolism, and upregulated signaling pathways. Mechanistically distinct herbs at their respective maximum cytostatic concentrations downregulate the status of endpoint biomarkers.

Conclusions: The data provides evidence for mechanistic leads of growth inhibitory efficacy of nutritional herbs on clinically relevant models for breast cancer. This outcome validates an experimental approach to identify and prioritize efficacious herbs as testable alternatives for the treatment of therapy-resistant advanced-stage breast cancer.

Recent Publications

1. Nitin Telang (2022): The Divergent Effects of Ovarian Steroid Hormones of the MCF-7 Model for Luminal A Breast Cancer: Mechanistic Leads for Therapy. *International Journal of Molecular Sciences* 23 (9), 4800
2. Nitin Telang (2022): Drug-Resistant Stem Cells: Novel Approach for Colon Cancer Therapy. *International Journal of Molecular Sciences* 23 (5), 2519
3. Nitin Telang, et.al, (2022): Anti-proliferative and pro-apoptotic effects of *Dipsacus asperoides* in a cellular model for triple-negative breast cancer. *Archives of Breast Cancer*, 66-75

Biography

Nitin Telang is the Director of the Cancer Prevention Research Program at Palindrome Liaisons Consultants, New Jersey. He earned his Ph.D. degree in India (1974) and obtained post-doctoral training at the University of Nebraska, American Health Foundation, New York, and Memorial Sloan-Kettering Cancer Center, New York (1976-1985). He has served as a faculty member at Memorial Sloan-Kettering Cancer Center, Weill-Cornell Medical College, and Strang Cancer Prevention Center, New York (1986-2007). He has published peer-reviewed papers in the areas of carcinogenesis, cancer prevention, and cancer stem cell biology. He has served on Grant Review Study Sections for the National Cancer Institute (NCI) and the US Department of Defense (DOD). He is on the editorial boards for *Oncology Reports*, *International Journal of Oncology*, and *World Academy of Sciences Journal*. His research has been funded by grants from NCI and DOD. He has received NCI FIRST Award, DOD IDEA Award, and AN Marquis Lifetime Achievement Award.

ntelang3@gmail.com