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From chemoprevention to identification of potential therapeutic targets and biomarkers for breast cancer

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Over the years, several phyto-compounds have been extensively used in Complementary Alternative Medicine (CAM) studies, individually and often at higher doses to kill cancer cells. Based on the combination and synergism theory, we had previously demonstrated that a combination of Resveratrol and Indole-3-Carbinol synergized and killed a maximum number of Breast Cancer cells. In the present study, we have tested various combinations of 10 well known phytochemicals, used at bioavailable levels, for their effect on cell growth and proliferation of the MDA-MB-231; breast cancer (BC) cell line and MCF-10A; normal breast epithelium as control cell line. The results revealed a super combination of 7phyto-compounds(7SC), that synergized and induced 100% clearance of the BC cells but did notaffect the normal breast epithelial cells. Next, in order to understand the underlying molecular mechanisms of this 'synergism' effect, microarray analysis will be conducted on themRNA collected from the 7SCtreated and control cells at 12 and 24 hour time points. Ongoing *in vivo* experiments aim to evaluate the efficacy of the 7SC phyto-compound treatment in preventing tumor growth using xenograft mouse BC model, and further validate the functional relevance of these genes in BC cell growth and survival. The data supports our hypothesis that the 7SC could be used in CAM as a dietary supplement approach against BC, and further identify genes that have the potential to serve as biomarkers and gene candidate to guide the design of appropriate anti-BC therapeutic strategies.

Biography

Somya Shanmuganathan is currently pursuing her third year PhD in Genomics of Breast Cancer at the Sultan Qaboos University, Oman. Prior to her PhD, she completed her Master of Business (Merit) at the Australian National University (Australia), Master of Biotechnology at the University of Queensland (Australia) and Master of Science in Applied Microbiology at the VIT University (India). She has been a reviewer for a number of articles in several reputed international journals and is currently involved in several breast cancer research works.

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Silver-based nanoparticles induce apoptosis in human colon cancer cells mediated through p53

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The authors have systematically investigated the anticancer potentiality of silver-based nanoparticles (AgNPs) and the mechanism underlying their biological activity in human colon cancer cells. Starch-capped AgNPs were synthesized, characterized and their biological activity evaluated through multiple biochemical assays. AgNPs decreased the growth and viability of HCT116 colon cancer cells. AgNP exposure increased apoptosis, as demonstrated by an increase in 4′,6-diamidino-2-phenylindole-stained apoptotic nuclei, BAX/BCL-XL ratio, cleaved poly(ADP-ribose) polymerase, p53, p21 and CASPASES 3, 8 and 9, and by a decrease in the levels of AKT and NF-κB. The cell population in the G_1 phase decreased, and the S-phase population increased after AgNP treatment. AgNPs caused DNA damage and reduced the interaction between p53 and NF-κB. Interestingly, no significant alteration was noted in the levels of p21, BAX/ BCL-XL and NF-κB after AgNP treatment in a *p53*-knockout HCT116 cell line. AgNPs are *bona fide* anticancer agents that act in a p53-dependent manner.

Biography

Shakti Ranjan Satapathy is working as a PhD scholar at Cancer biology lab, School of Biotechnology, KIIT University, India under the supervision of Dr. C. N. Kundu. He has published early work in *Nanomedicine* and other reputed journals.

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