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Nanooncolgy: A Radical Approach for the Treatment of Ovarian and Metastatic Breast Cancer

Mandeep Singh Kapoor*, Sanjay Kumar Gupta, Surendra H. Bodakhe

Institute of Pharmaceutical Sciences, Guru Ghasidas University, Bilaspur, India-495009, Email: mndpkapoor@gmail.com

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Breast cancer is one of the most common cancers in women in the developed countries of the world and it is the cause of death in approximately 20% of all females who die from cancer in these countries. Although relatively little is known about the molecular mechanisms leading to breast cancer development, breast cancers have probably been studied more than any other tumor type with regard to oncogene expression. *MYC, ERBB2* or one of the *RAS* families has been found to be expressed in over 60% of cases. Clinical and experimental data have indicated that exposure to estrogens is one of the leading causes of sporadic female breast cancer and in December 2002 estrogen was declared to be a known human carcinogen by the National Toxicology Program of the National Cancer Institute in the USA. It is becoming apparent that estrogen has separate hormonal and DNA-damaging cancer-promoting effects. Nanooncology, the application of nanobiotechnology to the management of cancer, is currently the most important chapter of nanomedicine. Nanobiotechnology has refined and extended the limits of molecular diagnosis of cancer. Nanooncology can serve as targeted drug-delivery vehicles carrying chemotherapeutic agents or therapeutic genes directly into malignant cells. Examples of such drug delivery devices for breast cancer include albumin-bound 130nm particle formulation of paclitaxel for injectable suspension approved by the FDA for metastatic breast cancer, and doxorubicin-loaded, long-circulating, polyethylene glycol-coated liposomes. The future of Nanooncology for the treatment of breast cancer inarguably could be considered as a better option than the conventional methods used for the treatment of breast cancer.

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