

Herbal Nanotechnology in Triple Negative Breast Cancer: A Comprehensive Review

Vaishnavi Rahul Potavale, Miss. Shiba D. Shaikh, Mrudula Gore

Sahakar Maharshi Kisanrao Varal Patil College of Pharmacy, Nighoj

Abstract: Triple-negative breast cancer (TNBC) represents one of the most aggressive and therapeutically challenging subtypes of breast cancer, characterized by the absence of estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2) expression. The lack of specific molecular targets limits treatment options primarily to cytotoxic chemotherapy, which is often associated with severe side effects and drug resistance. Herbal nanotechnology, an emerging interdisciplinary field combining phytomedicine with nanotechnology, offers promising therapeutic strategies for TNBC management. This review explores the current state of herbal nanoformulations in TNBC treatment, discussing various phytochemicals, nanocarrier systems, mechanisms of action, and future perspectives in this rapidly evolving field.

Keywords: Triple-negative breast cancer, herbal nanotechnology, phytonanomedicine, targeted drug delivery, natural compounds, nanoparticles

