

# **Harnessing Nanotechnology to Improve Targeted Cancer Treatment: Overcoming Hurdles in Its Clinical Implementation**

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## **Extended Abstract**

By 2040, the number of new cancer cases per year is expected to rise to 29.5 million and the number of cancer-related deaths to 16.4 million. Approximately 50 percent of all cancer patients can benefit from radiotherapy. Currently, we are at the limit of radiotherapy dose given to patients, creating a clear need for novel methods to enhance it to further improve the survival while reducing side effects. Nanotechnology offers a practical solution to many of these challenges. Nanoparticles (NPs) of high atomic number materials, such as GNPs, have shown promising results as radiosensitizing agents in multiple preclinical models of cancer. We have also shown that a unique combination of GNPs with other clinically approved radiosensitizing drugs such as docetaxel can produce synergistic therapeutic effects. In this talk, I will discuss the importance of combined therapeutic strategies to overcome current challenges imposed by the tumour and its microenvironment.