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LETTER TO THE EDITOR

# Don't Worry, We Have a New Weapon Against Cancer!

**TO THE EDITORS:**

We read the editorial article by Tyler with great interest. We agree with the author that the delivery of regional chemotherapy to an isolated limb continues to be an important treatment for patients with in-transit melanoma of the extremity. While the optimal form of treatment for these individuals remains to be determined, there are multiple strategies and therapies currently being explored that have the potential to improve response to therapy.[1]

> In the 21th century we have a new miracle weapon against cancer: "nanomedicine."

Nanomedicine is the application of nanotechnology to medicine and is based on three mutually overlapping and progressively more powerful molecular technologies. Nanotechnology is increasingly finding use in the management of cancer. Nanoscale devices have impacted cancer biology at three levels: early detection using, for example, nanocantilevers or nanoparticles; tumor imaging using radiocontrast nanoparticles or quantum dots; and drug delivery using nanovectors and hybrid nanoparticles.[2]

Nanoparticles can deliver chemotherapy drugs directly to tumor cells and then emit a signal after the cells are destroyed. According to the work done in 2004 at the Center for Biological Nanotechnology of the University of Michigan, drugs delivered this way are 100 times more potent than standard therapies. Metal nanoshells belong to a class of nanoparticles with tunable optical resonances that have been used for thermal ablative therapy for cancer. Nanoshells placed at depth in tissues can be used to deliver a therapeutic dose of heat by using moderately low exposures of extracorporeally applied near-infrared. Nanoshells may be combined with targeting proteins (proteins specific for the malignant melanoma) and used to ablate target cells. This procedure can result in the obliteration of solid tumors or possibly metastases not otherwise observable by the oncologist. In addition, nanoshells can be utilized to reduce angiogenesis present in cancer. Experiments in animals in vitro and in tissue demonstrate that specific cells (e.g., cancer cells) can be targeted and destroyed.[3]

In conclusion, nanotechnology clearly holds immense potential for targeting cancer and we believe that the next few years are likely to see an increasing number of nanotechnology-based therapeutics and diagnostics reaching the clinic.

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