Preface

Rapid advances in nanosciences along with the tremendous advances in our knowledge in cancer biology over the past few years have spawned applications of nanotechnology in cancer molecular medicine. The unique set of the physical/ chemical properties of nanoparticles, especially in sensing, image guidance, and delivery have attracted researchers and radiation oncologists to recognize its utility in radiation therapy, and the radioprotection of normal tissue. Leveraging the law of photoelectric effect discovered by Albert Einstein, platinum- and gold-based nanoparticles are now in use to increase the efficacy of radiation therapy. By emitting electrons upon activation, these nanoparticles damage bystander cells. Such nanoparticles can be enriched in tumor cells through passive approach such as enhance permeability and retention (EPR) and/or chemically/biologically targeted approaches, where they transform them into intracellular high-energy dose deposit. Thus cancer nanotechnology is rapidly integrating with both fields of diagnostics and radiation therapy. The growing number of clinical trials in these areas under the auspices of various peer-reviewed research bodies is a testament describing the potential of the field of nanotechnology in radiation therapy. The confluence of these two important fields that bridge physics and medicine is quickly making strides in opening new avenues and therapeutic strategies that complement radiation therapy- with a distinct footprint in immunotherapy, adoptive cell therapy, and targeted chemotherapy.

In this special issue of *Translational Cancer Research* (TCR) on "Applications of Nanotechnology in Radiation Research", we bring a set of exciting contributions that showcase the innovative and novel approaches in the utility of nanotechnology in Radiation therapy. This special issue is a compendium of critical reviews and commentaries in this multi-disciplinary field and provides a forum to learn several features of the integration of two fields between nanotechnology and Radiation therapy. Leading experts from both the nanoscience and Radiation oncology fields have made precise and timely effort to allow this issue to serve as a valuable reference to researchers, technologists, and clinicians with interest in nanotechnology and its application in radiation therapy. We would like to thank all the authors for the exemplary efforts in this work.

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Footnote

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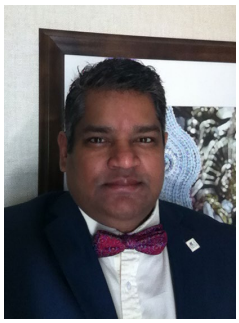
Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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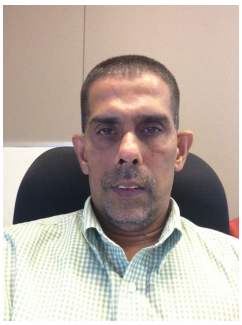

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