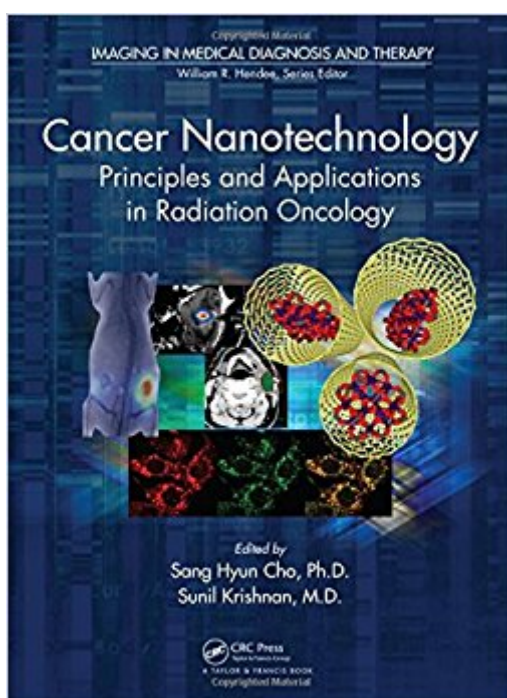


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Cancer Nanotechnology: Principles And Applications In Radiation Oncology (Imaging In Medical Diagnosis And Therapy)



Synopsis

Rapid advances in nanotechnology have enabled the fabrication of nanoparticles from various materials with different shapes, sizes, and properties, and efforts are ongoing to exploit these materials for practical clinical applications. Nanotechnology is particularly relevant in the field of oncology, as the leaky and chaotic vasculature of tumors is a hallmark of unrestrained growth, which results in the passive accumulation of nanoparticles within tumors. *Cancer Nanotechnology: Principles and Applications in Radiation Oncology* is a compilation of research in the arena of nanoparticles and radiation oncology, which lies at the intersection of disciplines as diverse as clinical radiation oncology, radiation physics and biology, nanotechnology, materials science, and biomedical engineering. The book provides a comprehensive, cross-disciplinary survey of basic principles, research techniques, and outcomes with the goals of eventual clinical translation. Coverage includes a general introduction to fabrication, preferential tumor targeting, and imaging of nanoparticles; the specific applications of nanomaterials in the realms of radiation therapy, hyperthermia, thermal therapy, and normal tissue protection from radiation exposure; outlooks for future research and clinical translation including regulatory issues for ultimate use of nanomaterials in humans. Reflecting profound advances in the application of nanotechnology to radiation oncology, this comprehensive volume demonstrates how the unique physicochemical properties of nanoparticles lead to novel strategies for cancer treatment and detection. Along with various computational and experimental techniques, each chapter highlights the most promising approaches to the use of nanoparticles for radiation response modulation.

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