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# Nanomaterials for Tumor Targeting Theranostics. A Proactive Clinical Perspective. Edited by Mingqian Tan and Aiguo Wu. World Scientific, 2016. Pp. 432. Price GBP 120.00 (Hardcover). ISBN 978-981-4635-41-7.

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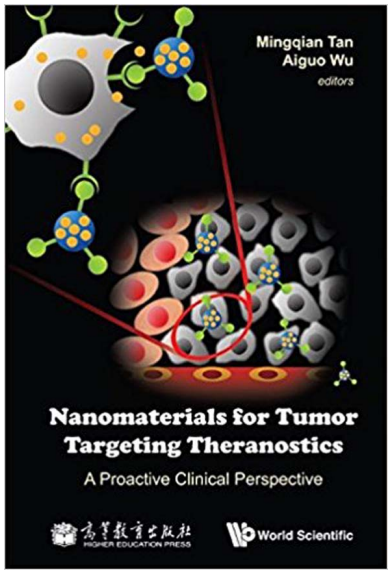




Nanotechnology is currently imparting a number of changes on our lives through its application in electronics, the automotive industry, life sciences, pharmaceuticals, aesthetic products *etc.* One of the major fields that is benefitting from the advent of nanotechnology is medicine, which is transforming rapidly to improve our quality of life. By using advanced nanotechnology in the medical field, scientists are trying to solve many unsolved problems that currently exist in the understanding and treatment of cancer. Scientists from many fields have joined together to develop the new interdisciplinary field known as bionanotechnolgy to create drugs that can target cancer cells selectively by sparing healthy normal cells. In the past decade there has been a spurt in research to develop nanodrugs to kill cancer cells selectively by using drugs with delivery vehicles such as polymeric nanoparticles, silica nanoparticles, gold/silver nanoparticles, lipids and carbon nanomaterials, separately or in combination. For doctors to identify tumour cells, they also need very good diagnostic techniques. Nanotechnology is proving to be ideal to support this field by providing many diagnostic nanotools such as quantum dots, magnetic nanomaterials, nanobubbles, upconversion nanomaterials *etc.*

A new term in advanced tumour therapy is 'theranostics' which combines therapy and diagnosis. This field has immense potential and provides vast possibilities for using many nanomaterials in combination for the purpose of theranostics. Although this field is currently in its infancy, many researchers are working in this area and many more researchers are joining the field, having discovered its huge potential. Even at this early stage of development, theranostics has made large advances and promises a number of possibilities to eradicate tumours and improve the quality of life in the near future. Although this field is highly promising, the lack of detailed and basic information for new researchers interested in joining the field has proved to be a big hurdle. The book *Nanomaterials for Tumor Targeting Theranostics: A Proactive Clinical Perspective* solves this problem to a large extent. This book provides a detailed account of a lot of the materials and techniques used in the theranostics field. The editors have made a very good attempt to cover almost all areas of theranostics and that has made this book excellent for enthusiastic persons, beginners as well as current researchers, to use as a resource book. The references used in the book are up to date and hence advanced researchers can use these references to improve their knowledge and to delve deeper into these techniques to discover new products with the potential to provide a complete cure for the menace of cancer.

The book comprises 14 well written chapters. Chapter 1 *Nanomaterials as Therapeutic/Imaging Agent Delivery Vehicles for Tumor Targeting Theranostics* gives a very good basic understanding about the field of theranostics and introduces many nanomaterials and different techniques. Chapter 2 *Basics of Theranostics in Tumor* introduces different nanoplatforms, nanoprobes, nanocarriers *etc.,* as well as discussing the safety issues and future directions. From Chapter 3 onwards this book gives an in depth discussion about each and every material used in the theranostics field. This chapter *Magnetic Nanomaterials for Tumor Targeting Theranostics* provides detailed information about paramagnetic and superparamagnetic nanomaterials that are used in this field. Chapter 4 *Quantum Dots (QDs) for Tumor Targeting Theranostics* gives very good information about the use of these materials and their advantages regarding diagnosis compared to

many existing diagnostic methods. Chapter 5 *Mesoporous Silica Nanoparticles (MSNs) for Cancer Theranostics* discusses the different applications of these nanoparticles as drug carriers as well as multifunctional carriers so that they can be used as biocompatible nanocarriers for theranostics. MSNs are one of the nanomaterials used to a large extent in different combinations in the field of theranostics.

Chapter 6 *Surface Enhanced Raman Scattering (SERS) Nanoprobes as Cancer Theranostics* provides information about different nanomaterials used in this field as well as their application in theranostics. Chapter 7 *Polymeric Nanosystems for Targeted Theranostics* gives a very good overview of these largely exploited nanosystems in the field of theranostics. Polymeric systems are very well executed in the drug delivery and imaging field due to their biocompability. This chapter indeed provides information about a number of successful polymer systems used in the theragnostic field. Chapter 8 *Carbon Nanomaterials for Tumor Targeting Theranostics* provides very good information about the application of nanotubes, graphene, carbon dots, fullerenes, nanodiamonds *etc.* in the field of theranostics. This chapter would be highly useful for many nanomaterials scientists working in the above-mentioned materials fields who wish to make an entry into the theranostics field. Chapter 9 *Lipopolyplex Nanoparticles for Tumor Targeting Theranostics* provides information about different nanocarriers such as cationic liposomes and polymers, particularly in gene delivery and imaging. Chapter 10 *Microbubbles for Tumor Targeting Theranostics* provides information about the preparation of microbubbles and the methods used to load drugs, as well as describing imaging using these microbubbles. This method is being explored greatly because of its advantages over other methods in the field of theranostics.

Chapter 11 *Upconversion Nanomaterials for Tumor Targeting Theranostics* gives information about many upconversion materials that have been introduced recently into the imaging field to solve deep-penetration imaging based problems. These materials, currently used to solve problems in imaging, can also be used as multimodel imaging materials. They are one of the possibilities for the imaging world in the future. Chapter 12 *Functional Dendrimers as Nanoscale Theranostic Vehicles for Cancer Treatment* provides a detailed account of dendrimers used in the theranostic field as a vehicle for drugs as well as imaging moieties. Biocompatible dendrimers have been used successfully to carry many drugs and imaging materials, and provide very good results in the theranostic field. They are considered to be one of the best vehicles used in this field. Chapter 13 *Protein-based Nanoparticles for Tumor Targeting Theranostics* describes the use of albumin in the theranostics field. Chapter 14 *Conclusions and future perspectives* provides a summary of all the materials used in theranostics so far, and gives an idea of the future prospects of the field. This chapter clearly provides a glimpse of future directions which can be used by researchers who are interested in entering this fascinating field.

The book *Nanomaterials for Tumor Targeting Theranostics: A Proactive Clinical Perspective* would be highly useful for students in the medical, materials, nanotechnology or other related fields to find out more about the future direction of multimodal nanodrug delivery that can bring changes in tumour-related research and clinical practice. Researchers and scientists from many fields would benefit from reading the book if they are interested in entering into this highly multidisciplinary field, and it can also be used as an excellent reference book for scientists who are currently working in theranostics.