Expert Review of Anticancer Therapy

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Corrigendum

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Corrigenda

Following the publication of the Review by Carolina Salvador-Morales, Weiwei Gao, Pooja Ghatalia, Farhan Murshed, Wataru Aizu, Robert Langer and Omid C Farokhzad, 'Multifunctional nanoparticles for prostate cancer therapy', published in the February 2009 issue of *Expert Review of Anticancer Therapy* (*Expert Rev. Anticancer Ther.* 9[2], 211–221 [2009]), it has been brought to our attention that a number of sentences in the Expert commentary and Key issues sections could be construed as misleading. The original Expert commentary and Key issues as printed was:

We believe that biodegradable and low immunogenic NPs will have a much greater impact on the fight against PCa if they are used as molecular probes and/or as diagnostic nanodevices rather than drug delivery carriers for chemotherapeutic agents. This rationalization is based on several facts: the use of a chemotherapeutic agent encapsulated in NPs when it is not distributed homogeneously into the tumor leads to the drug-resistance phenomenon; and the drug effect is a function of drug concentration and treatment duration [46]. In this regard, although there are currently some NP designs, such as polymer–lipid hybrid NPs, that might reduce this problem by increasing their chemotherapeutic effectiveness (high encapsulation yield) and the intercalation of water-soluble drugs in their hydrophilic compartments, drugs such as docetaxel and doxorubicin, once released into the tumor, could face problems associated with drug resistance factors, as mentioned in the section 'NP transport in the tumor environment'.

Which anticancer technique available today effectively addresses the PCa problem? According to Phase I clinical trial reports, hyperthermia using iron oxide NPs represents a promising treatment for PCa. The wide range of magnetic NPs intensively investigated by scientists has opened new doors for the treatment of PCa. The combination of antibodies with iron oxide NPs offers the possibility of overcoming some difficulties observed in hyperthermia therapy. The use of other magnetic NPs, such as maghemite and cobalt ferrite, can improve and transform hyperthermia as the leading treatment for PCa in this century.

Gene therapy using NPs for PCa is still in its infancy, although significant advances have been made in this area in the last couple of years. Gene therapy offers the most comprehensive treatment for PCa but faces many challenges. The hybridization of all three leading therapies may help to combat PCa. A wide range of questions remain on the table: should we develop NPs that delay the progression to androgen independence? This may involve targeting antiapoptotic factors, use of chemotherapy at the time of androgen ablation or the blockage/downregulation of AR activity [90]. In addition to these novel options, there are a number of promising strategies, such as targeting signal transduction pathways, cell cycle regulations, and differentiation and angiogenesis.

Key issues

- The use of multifunctional, biodegradable and low immunogenic nanoparticles can be more effective in prostate cancer treatment if they are used as imaging devices rather than chemotherapeutic carriers. Although it is true that the encapsulation of the chemotherapeutic drugs in nanodevices such as polymeric nanoparticles diminishes the harmful effects associated with chemotherapeutic agents without any carrier, chemotherapy still generates issues, such as drug resistance and complement activation reactions.
- Currently, the use of multifunctional nanoparticles in combination with hyperthermia is the leading technique for prostate cancer treatment.
- Gene therapy using nanoparticles to deliver siRNA and antisense oligonucleotides into prostate cancer cells is, perhaps, the most promising technique to combat this disease since this tackles the problem on a genetic level. However, several technical barriers must be overcome to make this technique efficacious.
- The ideal design of multifunctional nanoparticles to treat prostate cancer depends on an understanding of the anatomy and physiology of the prostate glands and tumors, and the physicochemical properties of the drug.

The correct Expert commentary and Key issues are shown below:

We believe that with continued research and development, biodegradable and low immunogenic NPs will have a great impact on the fight against PCa as drug carriers and molecular probes/diagnostic devices. It is important to note that the non-homogeneous delivery of therapeutic agents to tumors via NP delivery systems may lead to ineffective drug efficacy for drugs which intracellular delivery is required for bioactivity (e.g., siRNA); additionally non-homogenous drug delivery may enhance the emergence of chemotherapeutic drug resistance [46]. There are currently an increasing number of NP designs being developed for combination-drug therapy, enhanced tumor penetration and effective intracellular delivery (example: targeted lipid-polymer hybrid NPs) that might maximize the therapeutic effectiveness of drugs which need intracellular delivery, while minimizing drug resistance problems common to anticancer agents.

Which anticancer technique available today effectively addresses the PCa problem? While we won't know the answer to these questions for many years to come, several technologies have already reached clinical evaluation, including for example, the induction of therapeutic hyperthermia using iron oxide NPs. The wide range of magnetic NPs intensively investigated by scientists has opened new doors for the treatment of PCa. The combination of antibodies with iron oxide NPs offers the possibility of overcoming some difficulties observed in hyperthermia therapy. The use of other magnetic NPs, such as maghemite and cobalt ferrite, can potentially improve hyperthermia for the treatment for PCa.

Gene therapy using NPs for PCa is still in its infancy, although significant advances have been made in this area in the last couple of years. Gene therapy offers the most comprehensive treatment for PCa but faces many challenges. The hybridization of all three leading therapies may help to combat PCa. A wide range of questions remain on the table: should we develop NPs that delay the progression to androgen independence? This may involve targeting antiapoptotic factors, use of chemotherapy at the time of androgen ablation or the blockage/downregulation of AR activity [90]. In addition to these novel options, there are a number of promising strategies, such as targeting signal transduction pathways, cell cycle regulations, and differentiation and angiogenesis.

Key issues

- The use of multifunctional, biodegradable and low immunogenic nanoparticles can be effective as imaging devices and as chemotherapeutic carriers for prostate cancer diagnostic and therapeutic applications. Although it is true that the encapsulation of the chemotherapeutic drugs in nanodevices, such as polymeric nanoparticles, diminishes the harmful effects associated with chemotherapeutic agents without any carrier, chemotherapy delivery may face issues such as drug resistance and complement activation if nanocarriers are not optimally engineered.
- Currently, the use of multifunctional nanoparticles in combination with hyperthermia is an emerging technique for prostate cancer treatment.
- Gene therapy using nanoparticles to deliver siRNA and antisense oligonucleotides into prostate cancer cells is, perhaps, the most promising technique to combat this disease since this tackles the problem on a genetic level. However, several technical barriers must be overcome to make this technique efficacious.
- The ideal design of multifunctional nanoparticles to treat prostate cancer depends on an understanding of the anatomy and physiology of the prostate glands and tumors, and the physicochemical properties of the drug.

The authors and editors of *Expert Review of Anticancer Therapy* would like to sincerely apologize for any inconvenience or confusion this may have caused our readers.

Following the publication of the Editorial by Dimitrios H Roukos, Andreas Tzakos and George Zografos, 'Current concerns and challenges regarding tailored anti-angiogenic therapy in cancer', published in the October 2009 issue of *Expert Review of Anticancer Therapy* (*Expert Rev. Anticancer Ther.* 9[10], 1413–1416 [2009]), it has been brought to our attention that Table 2 was incorrectly printed as:

Table 2. Results from Phase III randomized controlled trials by adding bevacizumab to standard treatment in metastatic cancer.

Cancer type	Standard treatment	Addition of anti-VEGF	Overall survival improvement	Disease-free survival improvement	Ref.
NSCLC	Chemotherapy	Bevacizumab	Yes ($p < 0.05$)	Yes	[5,6]
Colorectal cancer	Chemotherapy	Bevacizumab	Yes ($p < 0.05$)	Yes	[5,6]
Breast cancer	Chemotherapy	Bevacizumab	No (NS)	Yes	[12]
Pancreatic cancer	Chemotherapy + erlotinib	Bevacizumab	No (NS)	Yes	[7]

NS: Not significant; NSCLC: Non-small-cell lung cancer.

The correct table is shown below:

Table 2. Results from Phase III randomized controlled trials by adding bevacizumab to standard treatment in metastatic cancer.

Cancer type	Standard treatment	Addition of anti-VEGF	Overall survival improvement	Progression-free survival improvement	Ref.
NSCLC	Chemotherapy	Bevacizumab	Yes ($p < 0.05$)	Yes	[5,6]
Colorectal cancer	Chemotherapy	Bevacizumab	Yes ($p < 0.05$)	Yes	[5,6]
Breast cancer	Chemotherapy	Bevacizumab	No (NS)	Yes	[12]
Pancreatic cancer	Chemotherapy + erlotinib	Bevacizumab	No (NS)	Yes	[7]

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