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Losic, Dusan

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International Journal of Nanomedicine, 2012; 7:4067

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10th May 2013

<http://hdl.handle.net/2440/77243>

Author's response

Dusan Losic

School of Chemical Engineering,
The University of Adelaide,
Adelaide, Australia

Correspondence: Dusan Losic
School of Chemical Engineering,
The University of Adelaide,
N119 North Engineering Building,
Adelaide, SA 5005, Australia
Tel +61 8 8303 4373
Fax +61 8 8303 4373
Email dusan.losic@adelaide.edu.au

We appreciate the kind comments from Dr FA Shiekh and his evaluation of our recent paper on nano-engineered drug-releasing Ti wires as an alternative for local delivery of chemotherapeutics in brain.¹ We enjoyed reading his comments and are pleased to hear his appreciation for new approaches outside conventional drug therapy aiming to address blood–brain barrier issues, certainly one of the most important problems in modern neurobiology. Nanotechnology approaches certainly offer considerable potential for designing new drug delivery systems and exciting developments will come in the near future. Nano-engineered drug-releasing devices for local drug delivery based on titania nanotube (TNT) arrays are a promising example that provide several advantages, which we highlighted in our paper.

In our work we presented initial in vitro studies using two model drugs, relevant CNS, and brain therapy to

demonstrate the potential application of TNT/Ti wires as drug-releasing implants, and we also noted that extensive in vivo investigations are necessary in the future to prove the performance of these implants. Although we didn't provide direct experimental evidence, previous studies successfully demonstrated the application and biocompatibility of TNT/Ti in animals² and in vivo conditions.³ In our recent work (Aw et al, unpublished data, 2012) using an ex vivo bone model, we developed a method to measure drug release kinetics from TNT/Ti wire inserted inside bone and to monitor drug distribution in bone. We propose that TNT/Ti wire implants could be inserted via a microsurgery inside or close to the target area of the brain where treatment is required. The invasiveness of TNT/Ti wire implants remains a disadvantage, even though the implantation of thin wires (0.5 mm diameter) is less invasive in comparison with other brain implants (polymer discs, 2 cm diameter). However, this limitation can only be addressed once in vivo studies have been performed. Nevertheless, we believe the potential benefits of this system for providing localized therapeutic effectiveness and bypassing the blood–brain barrier without systemic drug distribution is significant.

References

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