

# Challenging nanoparticles: a target of personalized adhesion prevention strategy

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## Dear editor

With great interest we have read an article by Wu et al<sup>1</sup> recently published in the *International Journal of Nanomedicine* aimed to estimate cytotoxicity, toxicity, and histopathological changes, as well as the postsurgical antiadhesion potential of biodegradable and thermosensitive micelles by combining in vitro and in vivo models.

Our congratulations to Wu et al<sup>1</sup> for their new, precisely designed, and promising study of nanoparticles used in the prevention of postsurgical adhesions. Even more so when we know that in most clinical studies the adhesion prevention adjuvants have failed. Taking into account medical and financial problems associated with postsurgical adhesions worldwide in the health care system, new developments in this area are welcomed and call for further investigation.

We do not question the definite study question and design: the experimental models are precisely formed and trigger correctly described results, a knowledgeable discussion and subsequent reasonable conclusions in line with their achievements.

However, in our opinion, for these biodegradable and thermosensitive micelles to be recommended for further clinical applications, experimental studies should be designed examining different doses of nanoparticles in order to establish the optimal dose of micelles, an evaluation of the impact of these materials in different time points after their application, ie, 14, 21, 28 days, as well as their long-term impact after 6 and 12 months.

The impact of these particles on embryos in in vivo models should also be evaluated: do these particles last longer or do they have an impact on uterine wall tissue?

In the future a personalized adhesion prevention strategy could be developed, with application of state of the art technologies, taking into account genetic and constitutional predisposing factors of the patients undergoing these surgical procedures, with targeted predisposing genetic and constitutional conditions.<sup>2</sup> Subsequently, these biodegradable and self-assembling micelles could be designed to contain medication such as recombinant tissue plasminogen activator (rtPA),<sup>3</sup> *tPA* genes, *inhibitors of plasminogen activator inhibitor-1 (PAI-1)* genes, or other cytokines activating the expression of individually targeted genes at certain times after surgery in order to lyse and remove temporary fibrinogenous adhesions.

In conclusion, biodegradable micelles containing certain medications should be a basis for future personalized adhesion prevention strategies.

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## Disclosure

The authors report no conflicts of interest or financial ties to disclose in regards to this communication.

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