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RESPONSE TO LETTER

Oriented Graphene Oxide Scaffold Promotes Nerve Regeneration in vitro and in vivo [Response to Letter]

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Dear editor

Thank you very much for your careful reading of our article and your honest advice. After receiving your letter, we have carefully evaluated the thoughtful comments, responded to these comments point-by-point.

In the present study, the dorsal root ganglia (DRG) explants, rather than DRG isolated neurons, were used to investigate neurite growth and alignment. Thus, the DRG explants were just preliminarily digested with 0.125% trypsin, which make the explants easier to be attached to the scaffold. The similar protocol has been used in the previous studies.[1,2] We agree with you that to culture DRG isolated neurons, collagenase or dispase is frequently utilized further to trypsin.

Nanofibers are formed by overlapping layers of fibers during the electrospinning process. Admittedly, with the increase in the number of layers of fibers, which will influence the infiltration of the cells. For in vitro study, the cells were cultured on the scaffold. For in vivo study, the scaffold were used to fabricate a nerve conduit, and the overlapping layers of fibers of the conduit wall prevents fibroblasts from growing into the conduit, which would be beneficial for nerve regeneration.

For mechanical stress experiments, we measure the thickness of the film, which is standardized in the calculation formula so that the final result already controls the effect of the thickness on the stress. In order to fabricate a scaffold with maximum electroactive GO and negligible toxicity, a concentration of 0.5% GO was chosen for nerve regeneration test in vitro and in vivo. Therefore, we characterized the conductivity of 0.5% GO scaffold. The effect of the specific conductivity on cell-scaffold interactions is something that we will explore in depth in our future studies.

In the present study, we focus on the synergistic impact of electroactive GO and oriented topographic guidance on nerve regeneration. We have described the orientational alignment, fiber diameters, distribution of the particles, electrical conductivity, water contact angles, tensile stress, stretchability and FTIR spectrato characterization of the scaffold. We directly cultured the DRG explant on the scaffold to test the synergistic impact of electroactive GO and oriented topographic guidance on nerve regeneration in vitro. As your proposal, the porosity of the scaffolds and cell attachment is also an important aspect of the scaffold that not showed in the present paper. Therefore, in the further studies, we will investigate these aspects in detail.

Thank you again for your carefully review of our paper and valuable suggestions, which helped extend our methods and thoughts for nanofibrous scaffolds characterization. We hope our responses could answer your thoughts and questions. If you have any question about this paper, please do not hesitate to let us know.

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Disclosure

The authors report no conflicts of interest in this communication.

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