**Electronic Supplementary Information (ESI)** 

## **Biocompatible Electrospinning Poly(vinyl alcohol) Nanofibres Embedded with Graphene-based Derivatives with Enhanced Conductivity, Mechanical Strength and Thermal Stability**

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The SEM studies for comparison of fibrous structures for PVA and PVA/GMGO composites were illustrated. Samples were prepared by the optimized process parameters of applied voltage (10 kV, 15 kV, and 20 kV), syringe pump flow rate (0.1 mL/h, 0.2 mL/h and 0.3 mL/h) at a concentration of 16.67 wt% for PVA composite solutions with syringe-needle-to-collected-target distance of 12 cm.

(1) PVA electrospun: 10 kV, 0.1 mL/h



(2) PVA electrospun: 15 kV, 0.1 mL/h



(3) PVA electrospun: 20 kV, 0.3 mL/h





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## (6) 0.1% GMGO/PVA electrospun: 10 kV, 0.3 mL/h



(7) 0.1% GMGO/PVA electrospun: 10 kV, 0.2 mL/h



(8) 0.1% GMGO/PVA electrospun: 10 kV, 0.1 mL/h



(9) 0.1% GMGO/PVA electrospun: 15 kV, 0.3 mL/h



(10) 0.1% GMGO/PVA electrospun: 15 kV, 0.2 mL/h



(11) 0.1% GMGO/PVA electrospun: 15 kV, 0.1 mL/h



(12) 0.1% GMGO/PVA electrospun: 20 kV, 0.3 mL/h



(13) 0.1% GMGO/PVA electrospun: 20 kV, 0.2 mL/h



(14) 0.1% GMGO/PVA electrospun: 20 kV, 0.1 mL/h



(15) 0.5% GMGO/PVA electrospun: 10 kV, 0.3 mL/h



(16) 0.5% GMGO/PVA electrospun: 10 kV, 0.2 mL/h



(17) 0.5% GMGO/PVA electrospun: 10 kV, 0.1 mL/h



(18) 0.5% GMGO/PVA electrospun: 15 kV, 0.3 mL/h



(19) 0.5% GMGO/PVA electrospun: 15 kV, 0.2 mL/h



(20)0.5% GMGO/PVA electrospun: 15 kV, 0.1 mL/h



(21) 0.5% GMGO/PVA electrospun: 20 kV, 0.3 mL/h



(22) 0.5% GMGO/PVA electrospun: 20 kV, 0.2 mL/h



(23) 0.5% GMGO/PVA electrospun: 20 kV, 0.1 mL/h







(25) 0.5% GMGO/PVA electrospun: 10 kV, 0.2 mL/h



(26) 1% GMGO/PVA electrospun: 10 kV, 0.1 mL/h



(27) 1% GMGO/PVA electrospun: 15 kV, 0.3 mL/h



(28) 1% GMGO/PVA electrospun: 15 kV, 0.2 mL/h



(29) 1% GMGO/PVA electrospun: 15 kV, 0.1 mL/h



(30) 1% GMGO/PVA electrospun: 20 kV, 0.3 mL/h



(31) 1% GMGO/PVA electrospun: 20 kV, 0.2 mL/h



(32) 1% GMGO/PVA electrospun: 20 kV, 0.1 mL/h



The photo images of PVA, GMGO/PVA, and AuGO/PVA were compared for the cytotoxicity test on fibroblasts L929. The results showed that PVA, GMGO/PVA and AuGO/PVA electrospun nanofibre mats own a negligible cellular toxicity.



Blank

PVA

0.3%GMGO/PVA



0.5%GMGO/PVA

1%GMGO/PVA

AuGO/PVA