Microfibrous Silver-coated Polymeric Scaffolds with Tunable Mechanical Properties

P. Kalakonda[1,2], M. A. Aldhahri[1], M.Sh. Abdel-wahab[1], A. Tamayol[3,4,5], K. Mollazadeh Moghaddam[3,4], Fathia Ben Rached[2], Arnab Pain[2] ,A. Khademhosseini[3,4,5,6,7], A. Memic[1,3*], S. Chaieb[2,8,9*],

[1]Center of Nanotechnology, King Abdulaziz University, Jeddah, 21589, Kingdom of Saudi Arabia

[2]Division of Biological and Environmental Sciences and Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal, 23955-6900, Kingdom of Saudi Arabia

[3]Biomaterials Innovation Research Center, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School. Boston, MA 02139, USA.

[4]Harvard-MIT Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge, MA 02139 USA.

[5]Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston, MA, 02115, USA.

[6]Department of Physics, King Abdulaziz University, Jeddah 21569, Saudi Arabia.

[7]College of Animal Bioscience and Technology, Department of Bioindustrial Technologies, Konkuk University, Hwayang-dong, Kwangjin-gu, Seoul, 143-701, Republic of Korea.

[8]Lawrence Berkeley National Laboratory, 1 Cyclotron road, Mailstop 6R-2100, Berkeley, CA, 94720 USA.

[9]Materials and Structures Laboratory, Tokyo Institute of Technology, Yokohama 226-8503 Japan

[a.] *Corresponding authors: amemic@kau.edu.sa and schaib@lbl.gov, sahraoui.chaieb@gmail.com

Supplementary Material:

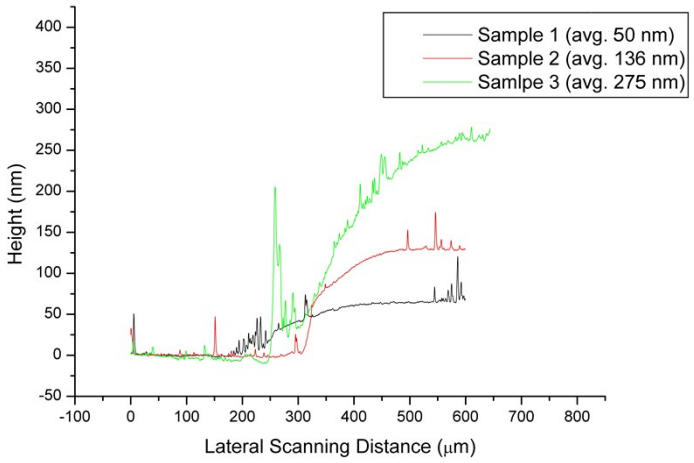

Fig. S1. Surface profile of thin films under different RF sputtering conditions. By varying the deposition time, we are able to systematically increase the thickness of the Ag layer that ranged from, 50 to 136 to 275 nm.

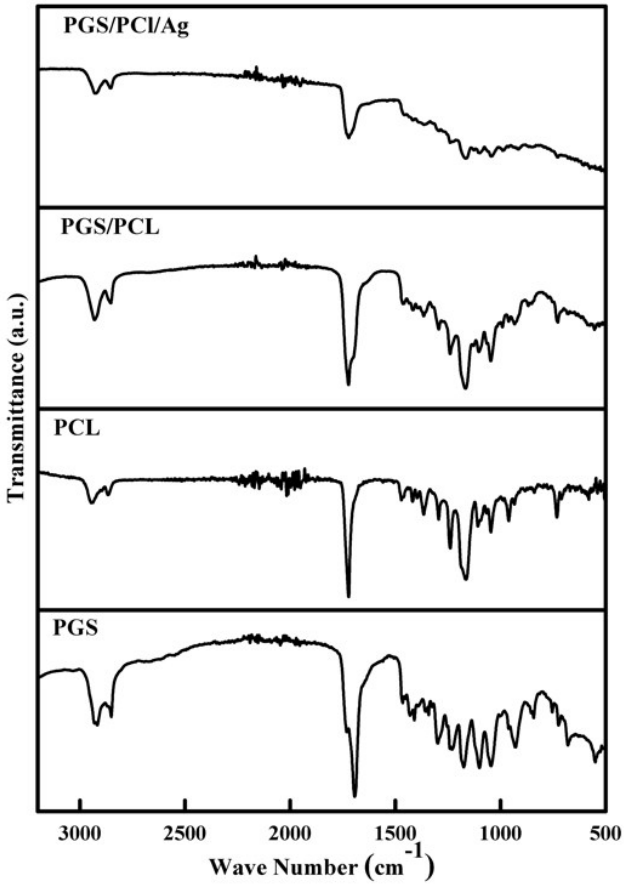

Fig. S2. FTIR of the various polymer used. Pure PGS. Pure PCL, the blend PGS/PCL, and the blend coated with Ag. Notice that, after Ag sputtering, the C-O peak at 1167 cm^{-1} almost disappeared so did the C=O peak at 1723 cm^{-1}.

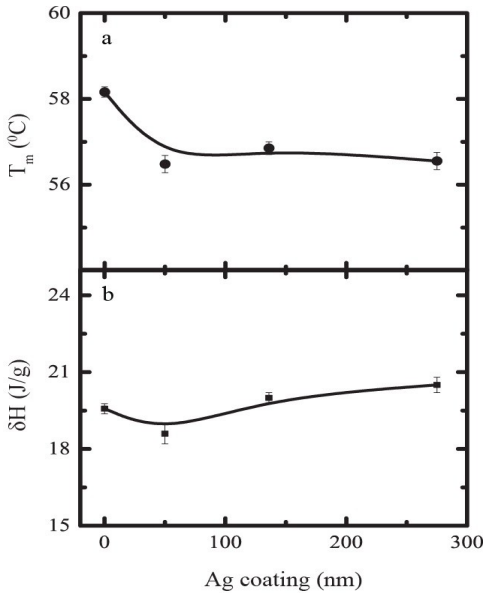

Fig. S3. (a) The melting temperature (T_m) of pristine fibrous scaffold of PGS/PCL and Ag coated fibrous scaffold as the function of Ag coating (b) The enthalpy change (δH) during melting of pristine fibrous scaffold of PGS/PCL and Ag coated fibrous scaffold as the function of Ag coating.