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## ***In-Vitro* Assessment of Washable Antibacterial Breath Mask Based on Polyacrylonitrile/Silver (PAN/AgNPs) Nanofiber**

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This report, focused on designed and synthesized polyacrylonitrile/silver (PAN/AgNPs) nanofibers via an *in-situ* method to obtain a washable with high-dispersed silver nanoparticles membrane to form the hierarchically organized antibacterial mask to prevent the two-way effect of bacteria from person to environment and environment to person. For this objective, the electrospun PAN nanofibers were stabilized via the heating method. Different amounts of AgNPs were loaded into the PAN nanofibers by using silver nitrate and sodium hydroxide solutions. The basic results showed that AgNPs was homogenously loaded in PAN nanofiber matrixes. Furthermore, the release profile based on two-stage release theory showed that when the negligible amount of AgNPs was loaded into the nanofibers, the release significantly decreased, whereas antibacterial activity increased. However, the release profile in two different temperature 28 °C and 37 °C showed that AgNPs release from nanofibers controlled in a minimum amount (less than 12%) after 120h. The appropriate potential for antibacterial activity of the lowest amount of AgNPs showed controllable. AgNPs release from PAN nanofibers that have a direct relationship with the washability and could promote the application of the produced product. Furthermore, the biocompatibility of different amount of loaded AgNPs to PAN nanofibers evaluated by using direct contact based on ISO 10993-5 that observed the minimum amount of AgNPs (2447 ppm per nanofiber gram) did not have any toxicity.

### **Biography:**

Davood Kharaghani's current research field is synthesis of nanocomposites and nanofibers scaffolds for tissue engineering application. Davood Kharaghani achieved a gold prize for a patent in Seoul international invention fair (SIIF2015). As a Ph.D. student and research assistant under the supervision of Professor Ick Soo Kim at Shinshu University, Japan, Davood started research in preparing composites nanofibers and their applications in tissue engineering. In collaboration with the University of New South Wales, Australia, under the supervision of Professor Mark Willcox for three months, technique learned: includes biocompatibility, antibacterial assay and staining cells and tissues using in tissue engineering.