Aharon Gedanken, J Nanomed Nanotechnol 2014, 5:5
http://dx.doi.org/10.4172/2157-7439.S1.017

OMICS Group Conferences
Accelerating Scientific Discovery

4th International Conference on
Nanotek & Expo

December 01-03, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

The Hospital of the future: Avoiding bacterial infection by making all the textiles antibacterial

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Sonochemistry is an excellent technique to coat functional nanomaterials on various substrates, and imparting new properties to the substrates. After a short demonstration of coating NPs on ceramics and stainless steel, author will present the coating of textiles such as polyester, cotton, nylon, and nonwoven. In all cases a homogeneous coating of NPs was achieved. Silver is known for generations as antibacterial, and indeed the Ag NPs have killed the gram-negative *E. coli* as well as the gram-positive *Staphylococus aureus* bacteria very efficiently. Lately, since the FDA shows less enthusiasm towards nanoAg we have moved to NPs of ZnO, CuO and MgO as antibacterial agents. They were coated on the above-mentioned fabrics and showed excellent antibacterial properties. The coated textiles were examined for the changes in the mechanical strength of the fabric. A special attention was dedicated to the question whether the NPs are leaching off the fabric when washed repeatedly. The coated ZnO NPs on cotton underwent 65 washing cycles at 92^{0}C in water in a Hospital washing machine, no NPs were found in the washing solution and an the antibacterial behavior was maintained. Recently an experiment was conducted at PIGOROV Hospital in Sofia, Bulgaria in which one operation room was equipped with antibacterial textiles, namely, bed sheets, pajamas, pillow cover, and bed cover. 25 Patients in this operation room were probed for bacterial infections. Their infection level was compared with 16 control patient that were using regular textiles. The results are demonstrating that a lower infection level is observed for those patient exposed to the antibacterial textiles.

Biography

Aharon Gedanken has completed his PhD at Tel-Aviv University, and postdoctoral studies from USC, Department of Chemistry. He retired from Bar-Ilan University on October 2009, still supervises a group of 20 MSc, PhD and postdoctoral fellows. He has published more than 660 papers in reputed journals and is serving as an editorial board member of 5 journals. He was the Israeli representative of the European Community to the NMP committee for the FP7 program. He was awarded recently the annual prize of the Israeli Chemistry Society for 2012 for his scientific achievements. He is a visiting Chair Prof. at NCKU, Tainan, Taiwan.

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