Project Runway: Creating an Antibacterial/Antifungal Fabric for Military Personnel and Athletes

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Can soldiers and athletes be protected from bacterial and fungal infections on the epidermal level? Using myrrh and licorice extracts in addition to copper and titanium nanoparticles, which combination of extracts and nanoparticles will be most effective in inhibiting fungal/bacterial growth on fabric? The agents used in the experiment were Saccharomyces cerevisiae, Rhodotorula rubra, Rhizopus stolonifer, Aquaspirillum itersonii, and Kocuria rhizophila due to their likeness to common bacterial and fungal infections. Squares of fabric were cut out from military socks and dipped into nine different nanoparticle/herbal extract solutions and placed into the designated petri dishes which were swabbed with the specific bacteria and fungi. The fungal petri dishes were put in a dark room while the bacterial petri dishes were placed in an incubator at 35 degrees Celsius. The petri dishes were taken out after three days and examined. For the fungi tested, the combination of myrrh and titanium created an average zone of inhibition of approximately 2 millimeters. The average zone of inhibition created by the myrrh and copper combination for the bacteria tested was approximately 7 millimeters. The results from the experiment show that there are new combinations which can be used on clothing to inhibit fungal and bacterial growth. Myrrh/Titanium could be sprayed on athlete's or soldier's socks when they’re exposed to humid environments. A spray of Myrrh/Copper could be used when soldiers are exposed to harmful bacteria in their line of service.

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