
Research contract with Texcar SPA for the Development of Antiviral Textile Products

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The worldwide, extraordinary outbreak of coronavirus pandemic (i.e., COVID-19) and other emerging viral expansions have drawn particular interest to the design and development of novel antiviral, and viricidal, agents, with a broad-spectrum of antiviral activity. Increasing public awareness about effects of pathogens on health creates a growing demand about antibacterial materials in various fields such as textile materials.

The idea of the project is to develop a functionalization process of the tissues that can make them antiviral / antibacterial, to prevent them becoming a host surface for the spread of harmful viruses and bacteria, as well as help to reduce the risk and rate of contamination and transmission

Specific objectives of the TEXCAR contract are:

- Evaluation of anti-viral activity, according to ISO 18184: 2019-Textile products, of samples produced and treated by TEXCAR using Viroblock. HeiQ Viroblock is a patent-pending combination of fatty spherical vesicle and silver nano-particles technology. This antiviral and antibacterial agent is suited for all kinds of textiles, including single-use, non-woven textiles for medical wear, such as protective face masks and surgical gowns.
- Development of a textile material based on copper yarns with anti-viral property. Research has shown that Metallic NPs, in particular Copper, can inactivate bacterial cells and norovirus surrogates by interacting with the cell membrane, causing leakage of intracellular substances, cell death interacting with (and denaturizing) capsid proteins.
- Evaluation of the filtration capacity, according to EN 14683, of Textile materials based on copper yarns produced by TEXCAR compared with surgical reference filter materials used for the production of facemasks for personal protection.

Preliminary results

TEXCAR polyester samples treated with Viroblock were evaluated for both cell toxicity and virucidal activity against SARS-CoV-2 at Retrovirus Center with over thirty years of experience in manipulation with virus, has specific instrumentation with biosafety level 2 and 3. The viral suspension was placed in contact with the samples at different time-points and the result at one hour, at room temperature, showed a significant reduction of infectivity of the Virus on Vero E6 cells.

Textile samples based on copper yarns from TEXCAR have demonstrated the reduction of infectivity of Sars-Cov-2 of one log with incubation after 5 minutes, of two log after 30 minutes and more than three log after one hour.

The filtration capacity, electrostatic capture of particulate matter and "breathability" of the mask will be evaluated.

Expected results: the development of antiviral textile products could suggest possible application not only in the textile sector but also in the medical field.

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Other: the project was granted by TEXCAR

Collaboration with AOUP retrovirus center (Prof. Mauro Pistello)
