

MIRIA Project – Development of antimicrobial, antiviral, and antifungal nanocoatings for everyday surfaces

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The MIRIA Project is a part of the initiatives undertaken around the world, in the wake of the COVID-19 pandemic, aimed at creating a safer environment, i.e., an environment in which the spread of pathogens is hindered as much as possible. In this framework, the MIRIA project will contribute by providing a means to contrast cross contamination, i.e., the possibility that viruses, bacteria or fungi can pass from one individual to another one through contact with everyday objects, such as door handles, public transport handrails, etc.

The means used to achieve the goal is the development of coatings and treatments that make the surfaces of the treated objects hostile to the proliferation of viruses, bacteria, and fungi. The challenges to be faced are many: the solutions developed will have to be able to act against a wide spectrum of pathogens; they will have to maintain their effectiveness even outside the research laboratories, when they are applied to large and complex components; their effectiveness needs to be targeted against pathogens only and must be harmless to people and environment; finally, they have to be economically viable.

The case study considered in MIRIA project is the hospital operation room. This choice was made for two reasons. Firstly, it is one of the most challenging environments possible, where cross contamination is on the one hand extremely likely and on the other hand can have serious consequences; therefore, a solution complying to the specifications required by a hospital can be transferred to other less critical applications, such as the aforementioned public transport handrails. Secondly, the operating room is a complex environment that contains components of several types, shapes, sizes, and materials, thus allowing the research group to work on a wide range of problems, eliminating the risk of developing solutions that may be suitable only for very specific applications.

In addition to the purely technical activity, the MIRIA project will place particular emphasis on the communication of its results. In fact, one of the non-secondary aspects of the recent epidemic has been the fear of contagion and the consequent sense of insecurity that many people feel in crowded places; the project wants to help reduce this anxiety by showing that it is possible to prevent – through MIRIA solutions – one of the possible sources of contagion.