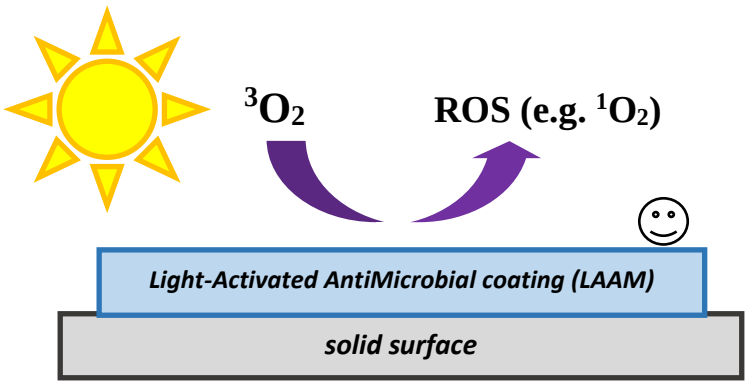
DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Hospital-acquired infections, so-called nosocomial infections, are defined as "*An infection acquired in the hospital by a patient who was admitted for a reason other than that infection*". As stated by WHO, such infections happen to more than 8.0% of patients and result in at least 37 000 deaths in Europe and 99 000 deaths in the USA each year. The economic impact of such infections is also considerable since they cause a prolonged stay of patients in hospitals. Thus, high attention is put nowadays on introduction of antimicrobial coatings in health-related areas in order to decrease a number of patients gaining nosocomial infections. Such surfaces being the subject of the presented project can be also applied as antimicrobial self-cleaning coatings on the daily use various personal devices/tools (i.e. electronics). One of the possible approach is application of light-activated coatings able to generate Reactive Oxygen Species (ROS) having strong antimicrobial properties.



In the presented project, novel triplet organic photosensitizers will be synthesized and then immobilized on a solid surface forming strong covalent bond between coating and surface atoms. The resulting light-activated monolayers, thanks to the presence of various units acting as light-harvesting *antennas* will be able to use visible light to produce ROS species. Light-Activated AntiMicrobial (LAAM) coatings will be formed mainly in the process of (electro)chemical grafting. The physicochemical properties will be studied by spectroscopic (XPS, Raman, IR) or microscopic (SEM, AFM) techniques. The effectiveness of ROS generation will be determined with common chemical traps, while antimicrobial properties will be tested against common bacterial strains, like *E.Coli*.

It is believed that the proposed Light-Activated AntiMicrobial (LAAM) coatings will exhibit high stability due to presence of a covalent bond with a surface and high efficiency of ROS generation under daylight illumination thanks to presence of various light-harvesting antennas.