UNIVERSITÀ POLITECNICA DELLE MARCHE

RESEARCH AREA:

HEALTH - IMMUNOLOGY

TITLE: Olive leave extract and its active components in the containment of cytokine storm and in the repair of tissue damage caused by Covid-19

Principal investigator: Prof.ssa Maria Rita Rippo, m.r.rippo@univpm.it, tel: 071 2206242

UNIVPM Research Group: Experimental Pathology

Research activity description: The pathogenesis of SARS-CoV-2 infection is characterized by a very aggressive inflammatory response strongly implicated in the resulting damage to the airways, multiorgan disfunction and acute respiratory distress syndrome (ARDS). The severity of the disease is therefore not only due to the viral infection itself but also to the host response, characterized by the production of cytokines and chemokines whose levels can further increase (cytokine storm) due to bacterial and fungal superinfections, favored by the poor oxygen supply caused by ARDS. Timely therapeutic choices aimed at reducing this cytokine storm and / or damage to the pulmonary infrastructure and promoting the repair of the damage itself, can improve the clinical outcome of the disease. However, the health emergency and the containment of the spread of coronavirus require much shorter response times than those often required by the approval of new drugs and therefore the proposal of natural anti-inflammatory molecules can represent a potential option in the development of targeted therapies. to contain the disease. Numerous studies demonstrate the anti-inflammatory properties of a group of phenols contained in the olive tree (fruit, oil and leaves). This project is aimed at testing the effectiveness of an extract of olive leaves and its purified active compound in counteracting the cytokine storm and promoting tissue repair using *in vitro*, *ex vivo* and *in vivo* models. These compounds are extracted and purified with a low environmental impact methodology without the use of solvents and reagents dangerous for human health. A formulation of the aforementioned active ingredients for aerosol administration will be studied, possibly encapsulating them in

innovative microparticles made up of biocompatible materials which, in addition to modulating their physico-chemical properties, could increase their bio-availability and specific release in the airways thanks to their bio / mucoadhesive characteristics.

Collaborators: Prof. Antonio Procopio, Green Chemistry Laboratory (G.C.L.) Università Magna Graecia, Catanzaro