

Multidisciplinary biomedical platform for an integrated approach against COVID – noCovid@UMG

The COVID-19 pandemic has produced a dramatic change in our lives and has pushed scientific research to operate at tremendous speed, leading to significant breakthroughs in record time. When, towards the end of February 2020, the international scientific community began to realize the gravity of the pandemic and how it was evolving, the efforts of the researchers multiplied.

If the information on the epidemiology of COVID-19 has grown rapidly, important unresolved ones still remain on the clinical complexity and on the mechanisms underlying the different phenotypes of the disease. COVID-19, in its most severe forms, is characterized by respiratory manifestations, although other organs are also affected, and acute illness is often followed by protracted complications. Such manifestations suggest that SARS-CoV-2 produces profound imbalances in host response mechanisms, triggering wide-ranging immune-inflammatory, thrombotic and parenchymal alterations. There are certainly similarities between COVID-19 and respiratory failure from other origins, but the peculiarity of some mechanical characteristics indicates that SARS Cov2 disease constitutes a new nosological entity, with emerging data suggesting a pathophysiological basis centered on endotheliopathy.

The efforts of basic and clinical research must therefore be focused on a better understanding of the pathophysiological mechanisms and a more accurate characterization of the immune-inflammatory imbalances in the whole range of phenotypes of the disease, in order to allow optimal care of the patients.

From a purely clinical point of view, the SARS-CoV-2 pandemic has shown how difficult it is to obtain reliable results on the characteristics and predictors of a new and rapidly evolving, whose management often has not been based on scientific evidence, given the limited resources and the unprepared health systems, both hospital and territorial. A care modality inclusive of all infected subjects (or most of them) followed from the moment of infection to the outcome ("continuum of care") according to protocols as standardized as possible, represents the fundamental basis for conducting studies that can offer reliable and transferable results to the entire patient population. Possible drop-outs of patients from this continuum, besides revealing the degree of ineffectiveness and inefficiency of the health system, tend to increase significantly the degree of uncertainty of the statistical models and of the results obtained in clinical studies.

The noCovid @ UMG project is based on the setup of a multidisciplinary biomedical platform for an integrated approach against COVID-19. The multidisciplinary nature of the proposal derives from the various components that contribute to the realization of the design and which, in our opinion, guarantee the strength of the project itself, since they range from basic research, albeit with a strong translational vocation, to the more purely clinical one.

In particular, the noCovid @ UMG project is based on the integrated work of the research groups belonging to the following units: a) Genomics; b) Proteomics; c) Pharmaceutical Chemistry; d) Clinical Pharmacology; e) Neuroscience; f) Nutraceuticals and Functional Foods; g) Infectious Diseases.

Through this integrated approach, the different aspects (molecular, metabolic, pharmacological and clinical) of SARS-Cov2 disease will be studied, to provide a complete response to the needs of patients and, at the same time, to identify and clarify the pathophysiological basis of this new and dangerous human pathology.

The team of researchers and clinicians will also benefit of the important support from two Research Infrastructures, the national IR Biomedpark@UMG 2.0, located within the Magna Graecia University Campus of Catanzaro, and the international IR ELIXIR, which will provide the skills and technologies necessary for the success of the noCovid@UMG project.