

# GEFACOV2.0 CONSORTIUM: FIGHTING AGAINST COVID-19

In the first months of 2020, while the entire world was anxiously fighting against the global COVID-19 pandemic, a new international consortium, named GEFACOV2.0, was born. Its main feature is a **transdisciplinary approach**.

So far, the biology and pathology of SARS-CoV-2 has not been fully understood. Science is facing a great challenge: in this context, GEFACOV2.0 consortium can make an important contribution, facilitating the progress of translational research aimed at finding a cure as soon as possible. Several partners of the GEFACOV2.0 are oriented to "genetics and molecular biology" with activities focused on pathogen and host genomes, proteomics, transcriptomics, metabolomics, system biology, immunology.

## A consortium. Why?

The consortium was carefully assembled in order to combine the skills, knowledge and key resources necessary to achieve the general objective of the project, aimed at studying virus-host interactions; this would help to understand the pathogenesis of COVID-19 and the host's defenses, which can influence infection with the SARS-CoV-2 virus or prevent the onset of resistance to repositioned or new drugs.

## Who is who

The GEFACOV2.0 consortium is made up of 29 participating institutions from Europe, China, Africa and Iran. GEFACOV2.0 is a truly interdisciplinary project and involves clinicians, (molecular) virologists, (molecular) biologists, epidemiologists, health economists, and experts in decision making/policy making/pharmaceutical industry/ethics.

The consortium involves 29 partners from 5 different European countries and 3 International:

- ⇒ Italy
- ⇒ United Kingdom
- ⇒ France
- ⇒ Austria
- ⇒ Germany
- ⇒ China
- ⇒ Iran
- ⇒ Burkina Faso

## Consortium Bodies

The core consortium bodies are:

- The Coordinator as intermediary to the EC and responsible for overall coordination
- The Steering Committee as the strategic and decision making entity,
- The Executive Board for operational decision making
- The Exploitation and Dissemination Board
- The Advisory Board



**Project Coordinator:** the University of Rome Tor Vergata will coordinate the project and Prof. Giuseppe Novelli is the project coordinator (PC). He is active in the continuous monitoring of the scientific project progress. This includes the review of scientific reports and deliverables before they are uploaded in the project's website and EC portal. PC will lead the management of project's administrative and financial tasks

and will be responsible for the effective communication among all partners. He will also be responsible for the proper use of the project budget, the repartition among partners and for taking specific measures in case of problems.

### Partners and Team Leaders

Università degli Studi di Roma "Tor Vergata"; Prof. Giuseppe Novelli  
INMI Lazzaro Spallanzani; Dr. Concetta Castilletti  
PharmGenetix GmbH; Markus Paulmichl  
Fondazione Giovanni Lorenzini; Prof. Sergio Pecorelli  
Universidad Carlos III Madrid; Prof. Juan Romo  
University of Essex; Prof. Efstathios Giotis  
Università degli Studi di Brescia; Prof. Marco Metra  
Bioscience Genomics; Dr. Alessandra Tacconelli  
AlfaSigma; Dr. Emilio Merlo Pich  
B. Braun Dortmund; Dr. Jörg Ingo Baumbach  
Diatheva; Prof. Mauro Magnani  
Termofisher; Dr. Luca Quagliata  
University of Isfahan; Prof. Kamran Ghaedi  
Essen University Hospital; Dr. Katharina Fleischhauer  
Università degli Studi di Trieste; Prof. Paolo Gasparini  
King's College London; Prof. Mariam Molokhia  
Ospedale Pediatrico Bambino Gesù, Roma; Dr. Antonio Novelli  
Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico; Prof. Giacomo Grasselli  
Università degli Studi di Padova; Prof. Andrea Crisanti  
TOMA Impact Lab group; Dr. Francesca Romana Grati  
Università di Torino; Prof. Antonio Amoroso  
Université de Bretagne Occidentale; Prof. Claude Férec  
Fondazione Aviralia; Prof. Carlo Federico Perno  
Abbvie; Dr. Annalisa Iezzi  
Shanghai Institute of Nutrition and Health, Chinese Academy of Sciences; Prof. Yufang Shi  
daVinci Digital Therapeutics; Dr. Giuseppe Recchia  
Genome Diagnostics B/V; Dr. Maarten Penning  
Centre de Recherche Biomoléculaire Pietro Annigoni; Prof. Jacques Simportè  
GeNeuro; Dr. Hervé Perron

### Objectives

GEFACOV2.0 intends to assemble a large, multinational European and non-European cohort of infected and non-infected individuals, identify the genetic determinants of the host and the virus capable of modulating the phenotype of the COVID-19 disease and of characterizing genomic and non-genomic biomarkers useful for predictive diagnostics, prognosis, pathophysiology and pharmacogenetics in SARS-CoV-2 infection.

<b>O1.</b> Identify key host genetic variants contributing to the clinical outcomes (from no symptom to mortality) of COVID-19
<b>O2.</b> Defining a Pharmacogenomics (PGx) landscape of drugs with potential to be used in the COVID-19 treatment
<b>O3.</b> Identify novel pathophysiologic pathways and networks triggered by SARS-CoV-2

**O4.** Tracking and correlating the evolution of SARS-CoV-2 with geographical and clinical patterns of COVID-19 in EU and overseas

**O5:** Assessment of the impacts of social and economic factors: HTA, CEA and Opportunity Cost analysis

### **The role of the Universities**

There is a clear emphasis on research excellence thanks to the 5 Italian Universities, which through their University Hospitals are very active in the fight against COVID-19.

These structures have been considered as COVID-19 Hospitals by the Regional Health Authorities of Italy, and **will be the key partners in the project. They will provide substantial high level clinical data which - following appropriate analyses - might highlight clinical correlations of the discovered biomarkers panels and support their validation for clinical purposes** of complex disease. The Universities, with their suggestions and advice will: i. help GEFACOD2.0 to further prospectively develop the biomarkers panels in clinical studies -and, as appropriate, based on the generated evidence; ii. disseminate and exploit research results in clinical practice; iii. use in clinical context to support and to optimise further epidemiological and clinical studies design for new treatments in patients with COVID19.

### **About partners**

GEFACOV2.0 includes the specialized Research Centre INMI, a European reference Center for COVID-19, 6 European SMEs, 2 Pharma and 3 MedTech Companies. All Companies are active in the production of diagnostic kits, companion diagnostics, drug technology transfer, market research, and drug research in infectious diseases. In addition, the GEFACOV2.0 advisory committee is made up of 5 internationally recognized scientists, experts in Human Genetics and Complex Diseases, who, with their suggestions and advice, will help GEFACOV2.0 to further develop, disseminate, and exploit research results in clinical practice. Another partner is the DEB committee which includes experts and professionals active in the business world at European level. One of the partners, TFS, is a world leader in NGS technique and molecular diagnostics. In 2019 BIOGEN was conferred with the 13th edition of the *Award for young hi-tech companies generated by academic research* by the Italian Master Startup Award 2019. Another partner, Bioscience is active on the national and international genetic diagnostic markets with offices in Dubai and Hong Kong.

### **The project**

GEFACOV2.0 is focused on an ambitious project that aims at providing undisclosed non-invasive biomarkers. All knowledge required for the discovery, the validation and the qualification of these biomarkers are gathered within the GEFACOV2.0 consortium. The involved expertises will provide a solid basis to successfully carry out the different steps of the proposed work plan to deliver the following:

1. Establish and evaluate a multiethnic cohort of SARS-CoV-2 infected and non-infected individuals, identification of genomic and other omics biomarkers for COVID-19;
2. Validation of the discovered biomarkers;
3. Qualification of the discovered biomarkers at the EMA;
4. Development of bioinformatics tools for the search of COVID-19- related genes.