

Institution	Country	SARS-CoV-2 Activities and Services
1	NL	<p>University Medical Center Utrecht</p> <p>Sampling of COVID19 suspected patients in the emergency response unit and in the ICU (medium/high care).                      Plasma and cell isolation and Olink technology for ongoing mechanisms determination                      Service provider for the Olink technology and capacity to run assays for external groups.                      Lumindex assay for ~150 markers available for quantification.                      ARCADIA and UDAIR available to process blood/plasma/serum, urine and liquor (CSF)</p>
2	IT	<p>Istituto Nazionale Tumori - IRCCS G. Pascale</p> <p>Coordination of a Phase 2 clinical trial with Tocilizumab which is an anti-IL-6 moab for COVID-19 infected patients. This is an academic nationwide study approved by the Italian Drug Regulatory Agency with 300 patients in addition to an observational study on open label participants</p> <p>1) High through put screening technology and FDA approved drugs library to be screened in cellular based system to identify molecules that can interfere with virus infection ; or that can reduce cytokines production                      2) Multiplexing technology to measure up to 48 cytokines/chemokines on the same sample either patient's plasma (to evaluate cytokines storm induced by the virus and the effect of drugs that counteract it), or cell surnatants                      3) NMR-based measurement of oxidative stress and metabolism in multiplexing in patient's plasma to eventually evaluate early deterioration and drop in oxygen saturation</p>
3	NL	<p>Biomedical Primate Research Centre</p> <p>Macaque model for SARS-CoV-2 indevelopment Ongoing vaccine study from a third party to study vaccine safety and efficacy in a rhesus macaque model.                      Corona macaque models (Cyno and rhesus) for vaccine and drug studies.                      Marmoset models available, but the animal license for that study has not been provided yet (for macaque studies the license is in place for both vaccine and drug-related studies).                      Capacity to analyse viral load (PCR, culture), immunological and clinical parameters (including CT scans) in addition to providing pathology reports (gross pathology and histopathology).                      Lung lesions can be followed real-time using our in house (pet)-CT in addition to telemetry (home cage activity and body temperature) and virological and immunological assays.</p>
4	PT	<p>IBET - Instituto de Biologia Experimental e Tecnológica</p> <p>Support for the COVID effort with reagents and equipment. Fast access to key services and facilities for research projects to combat COVID-19. Including:</p> <p><b>GMP manufacturing and analytical characterization of vaccines</b></p> <p><b>Bioprocess Development</b></p> <p>Upstream Process Development                      Molecular Biology                      Cell Line Development                      Bioprocess optimization and scale-up:                      Expression &amp; Culture System                      Bioreactor systems (e.g. stirred-tank, wave bioreactors)                      Bioreactor types (glass; stainless-steel; single-use)                      Operation modes (batch, fed-batch, perfusion and continuous)                      Downstream Process Development – DSP                      Purification of secreted and intracellular viral particles                      Ultracentrifugation                      Membrane technology: AKTA Crossflow – scalable, ultrafiltration systems                      Chromatography: AKTA Platform Technology (Explorer, Avant, Pure and Pilot)</p> <p><b>Analytical Services (GMP)</b></p> <p>Development, Optimization and Implementation of Analytical Methods                      Post development and analytical method transfer for QC                      Analysis of cell and viral banks                      Batch certification                      Quality Control Testing                      Evaluation of chemical, biological, microbial, viral and endotoxin contamination                      Techniques and equipment available:                      Common Molecular Biology (SDS-PAGE, qPCR, Western Blot, ELISA...)                      Restriction enzyme analysis                      Aggregation and refolding (SEC and RP chromatography)                      Genomic integrity                      Physical/total particles Titer (Spectrophotometry, qPCR)                      Cell based assays for Functional and Potency determination:                      TCID50                      plaque assay                      reporter gene assays                      cell viability and proliferation                      apoptosis and cell death,                      antibody dependent cell mediated cytotoxicity (ADCC)                      signaling and secretion.                      Detection of adventitious agents                      Process related impurities and bioburden (Residual/Host Cell protein and DNA; Benzoylase, Triton, BSA...)</p> <p><b>Mass Spectrometry Services</b></p> <p>Protein/peptide identification, including Intact Mass Determination                      Antibody Characterization/MAM                      High-throughput Quantitative Proteomics – SWATH analysis, MRM-HR and label-based quantification (e.g. ITRAC)</p>

			Fragmentation Profile
			Intact Protein Measurement
			Small Molecule Mass Measurement
			Small Molecule Identification & Quantification
			MALDI Imaging (under development)
			<b>Advanced 3D cell Models (for Drug Development studies)</b>
			Neural
			Hepatic
			Cardiac
			Cancer (Breast, Lung)
			Immuno-oncology cell models (including immune component)
			<b>cGMP Manufacturing of Biopharmaceuticals (at Genibet):</b>
			GMP manufacturing and analytical characterization of vaccines
			Process Development (together with iBET)
			Biopharmaceutical Production (Drug Substance and Drug Product)
			Production of Master and Working Cell Bank / Virus Seed Stock Production
			Fill and Finish
			Quality Control and Quality Assurance Services
			cGMP Manufacturing portfolio includes:
			Polysaccharides
			Recombinant Proteins
			Plasmid DNA
			In vitro transcribed RNA
			Virus and Virus Like Particles –including viral banks
			Cell Banks
			Live Microbial Products
5	Testa Center	SE	Availability of production equipment for protein production in pilot scale. Testa Center is a private public partnership between the Swedish government and GE Healthcare making the facility available for the Life Science community in large.
			Support for upstream and downstream processes development as well as support for scale up of a start-to-finish process. Cell culture capabilities from up to 500L (pilot scale) single-use bioreactors for mammalian cells and 50L (single-use) for microbial cultures. In analogy, the harvest and protein purification capabilities range from lab bench scale instrumentation to full production scale chromatography instrumentation. The facility is non-GMP, enabling technical runs for scalability or generation of larger amounts of material for research.
			Shaker incubators and bioreactors (batch, fed-batch and perfusion): ReadyToProcess Wave25, rocking platform Applikon 1-5 L stir tank Xcellerex XDR50 dual Xcellerex XDR200 Xcellerex XDR500
			Cell separation through filtration or centrifugation: AKTA Flux 5 AKTA Flux 6 AKTA readyflux Depth filtration Continuous centrifugation
			Protein purification: AKTA Start AKTA Pure AKTA Pilot AKTA Ready AKTA Process Columns in a variety of sizes
6	Lund University	SE	Human antibody development using phage display technology from large combinatorial in-house synthetic antibody libraries. Extensive experience in development of antibodies from patient derived antibody libraries using phage display technology
			Characterization of antibody binding kinetics and affinity using Surface Plasmon Resonance Technology. High throughput capabilities are available (Bruker MASS-16)
			Characterization of antibody binding capabilities to cells using high throughput flow cytometry (iQue Plus)
			Mass spectrometry analysis with a particular focus on post-translational modifications (e.g. Thermo Q Exactive HF-X mass spectrometer with uHPLC)
			Spatial omics analysis using Digital Spatial Profiler technology (nanostripping GeoMx)
			Multiplexed (up to 800-plex) analysis of RNA, DNA and protein (nanostripping nCounter technology)
7	SciLife Labs	SE	New rapid color detection method for SARS-Cov-2 (ILACO) available
			Array based serologic identification of Covid-19 recovered individuals
			<b>COVID-19 Action Plan in place.</b> The Action Plan consists of two parts: 1) SciLifeLab/KAW Program for SARS-Cov-2 virus testing, and 2) SciLifeLab Open Call for Proposals, to battle the epidemic. – The first part, the SciLifeLab/KAW Program for SARS-Cov-2 virus testing, has been established as a result of the Knut and Alice Wallenberg Foundation's (KAW) generous grant to SciLifeLab, Karolinska Institutet and Uppsala University to set up COVID-19 testing and analysis capabilities. Some of this funding has been pre-assigned to several initiatives coordinated by SciLifeLab. These initiatives focus on e.g. sampling COVID-19 patients for analysis of disease pathogenesis; testing the virus in national coordination with healthcare; and developing additional testing, sequencing and serology technologies. The second part, the SciLifeLab Open Call for Proposals, is a call launched nationwide by SciLifeLab. It welcomes proposals from researchers all over the country and the aim is to create a comprehensive national program to combat the corona epidemic. Proposals should focus on coordination of samples, studies and data; technology development; or research projects. While all proposals will be considered individually, some of them may be merged or coordinated jointly to create synergies. The call is funded by both SciLifeLab national funds and external sources such as KAW and the goal is to have projects up and running as soon as possible. Developing inhibitors of the main protease of SARS CoV2 and raising antibodies against the spike protein
8	Mario Negri	IT	Ongoing study on the inhibition of SARS-CoV-2 replication through the inhibition of Cyclophilin A

			Study exploring CyclophilinA as a possible biomarker of patients at high risk of developing severe pneumonia Design, synthesis and characterization of peptides aimed at inhibiting SARS-CoV-2 entry into the host cells Establishment of a biochemical platform to evaluate binding to ACE2 of potential new drugs Participation to the Regione Lombardia Crisis Unit for the support of the Emergency Rooms and Intensive Care Units Study on the pharmacological supportive therapy in patients under ventilatory treatment Evaluation of the effect of early CPAP treatment on subsequent need for invasive ventilation Creation of a registry and a network of hospital centers to monitor clinical and epidemiological characteristics of patients not requiring intensive care
9	Rīga Stradiņš University, Institute of Microbiology and Virology (MVI)	LV	Researchers are planning to study the biological properties of the SARS-CoV-2 by detecting the presence of virus genomic sequence in different COVID-19 patients' biological material in time of disease progression and 10 days after, as well as by determining cytokine and chemokine level; anti-human immunoglobulin class antibodies against different recombinant SARS-CoV, MERS-CoV and SARS-CoV-2 antigens using SMIA; patients' immunological status by measuring immunocompetent cells population and by analysing research and clinical data to predict the spread of SARS-CoV-2 worldwide.
10	Latvian Biomedical Research and Study Centre (BMC)	LV	Scientists working in two directions of SARS-CoV-2 research. Including vaccine study against SARS-CoV-2 development and sequencing of the entire genome of the virus
11	Latvian Institute of Organic Synthesis (IOS)	LV	Can provide an integrated research platform to perform discovery and pre-clinical development of new therapeutics as well as to support development of new strategies to reduce risks of COVID-19 associated complications and shortening of rehabilitation period. This includes medicinal chemistry, structural biology and pre-clinical pharmacology research as well as ADMET tests. IOS is a medicinal chemistry partner site of EU-OPENSCREEN and may facilitate access to the high capacity pan-European screening platform.  Biological samples and clinical data from COVID-19 cases available for Latvian population. • Sequencing of SARS-CoV-2 virus samples from infected cases in Latvian population to follow virus variability and associate with clinical disease outcomes. • Development of vaccine against SARS-CoV-2 based on virus epitope presentation on virus-like particles. Contact persons: Janis Klovinš, email: klovin@biomed.lu.lv and Vita Rovite, email: vita.rovite@biomed.lu.lv
12	San Raffaele University Hospital	IT	Key Elements of Preparedness for Pandemic Coronavirus Disease 2019 (COVID-19) in Nuclear Medicine Units Comprehensive biobank of COVID-19 patients In vivo studies of viral pathogenesis and antiviral drug safety/efficacy. Access to clinical cohorts, Biobanks and trial facilities
13	CEA	FR	COVID-19 Challenge Model
14	IBIS	ES	Expertise in influenza vaccines  Ongoing multicenter study of coronavirus disease 2019 (COVID-2019) in Solid Organ Transplant Recipients, led by Dr. Elisa Cordero, with the support of the Spanish Network for the Research in Infectious Diseases (REPI, ISCIII). This Project has also been sent to the Immunocompromised Hosts Group (ESGICH) of the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) to integrate other European research groups.  SARS-CoV-2 viral load in respiratory airways and blood as factor associated to the clinical outcomes in COVID-19 adult patients, led by Dr. Javier Sánchez Céspedes, with the support of the Spanish Network for the Research in Infectious Diseases (REPI, ISCIII).  Research group on Clinical Research in Infectious Diseases: led by Dr. Jesús Rodríguez Baño <a href="https://www.ibis-sevilla.es/investigacion/enfermedades-infecciosas-y-del-sistema-inmunitario/investigacion-clinica-en-enfermedades-infecciosas.aspx">https://www.ibis-sevilla.es/investigacion/enfermedades-infecciosas-y-del-sistema-inmunitario/investigacion-clinica-en-enfermedades-infecciosas.aspx</a> Project: A cohort study to identify phenotypes of COVID-19 patients predictive of complications and mortality. Sent to the Urgent request for expressions of interest for extraordinary financing of research projects on SARS-VOC-2 and COVID-19 disease from the Spanish Agency Institute of Health Carlos III (ISCIII).  Research group on Computational Systems' Medicine: led by Dr. Joaquín Dopazo <a href="https://www.ibis-sevilla.es/investigacion/oncohematologia-y-genetica/medicina-computacional-de-sistemas.aspx">https://www.ibis-sevilla.es/investigacion/oncohematologia-y-genetica/medicina-computacional-de-sistemas.aspx</a> Application: a version of their application on mechanistic models of cellular signaling focused on the routes SARS-CoV-2 uses, and which is being updated with the maps of the Disease Maps consortium: <a href="http://hipathia.babelomics.org/covid19/">http://hipathia.babelomics.org/covid19/</a> Data from a previous project: the BBVA Foundation Project Machine Learning to combat rare diseases (MLDrugRD), awarded in the call for "Scientific Research Teams - Big Data 2018", aims to use Machine Learning to extract information from the public genomics repositories, to obtain therapeutic targets or reformulation of existing drugs, that help to combat or alleviate the pain of rare diseases. Now, they are reusing the algorithms developed, in the case of COVID-19. This is an example of what they are doing: <a href="https://bmcbioinformatics.biomedcentral.com/articles/10.1186/s12859-019-2969-0">https://bmcbioinformatics.biomedcentral.com/articles/10.1186/s12859-019-2969-0</a> Webpage: updated with bioinformatics resources related to COVID-19: <a href="http://www.clinbioinfospa.es/CovidResources">http://www.clinbioinfospa.es/CovidResources</a> Project: Mechanistic model based on artificial intelligence for the reuse of drugs against SARS-CoV-2 infection. Sent to the Urgent request for expressions of interest for extraordinary financing of research projects on SARS-VOC-2 and COVID-19 disease from the Spanish Agency Institute of Health Carlos III (ISCIII).
15	VHIR	ES	- Whole-genome sequencing of SARS-CoV-2 and other respiratory viruses in upper and lower respiratory tract specimens - NGS re-sequencing of human infectious agents - Bioinformatics' solutions for deep-sequencing data analysis - Studies of viral genetic diversity (QSublits opens-source online tool)  - Phase 3 Randomized Study to Evaluate the Safety and Antiviral Activity of Remdesivir (GS-5734™) in Participants with Severe COVID-19, - Phase 3 Randomized Study to Evaluate the Safety and Antiviral Activity of Remdesivir (GS-5734™) in Participants with Moderate COVID-19 Compared to Standard of Care Treatment, - Adaptive study Phase 2/3, randomized, double blind, to evaluate the efficacy and security of Sarilumab en hospitalized patients for Covid-19  Viral Detection through qPCR - Detection and quantification of metabolites and peptides through UPLC-MS/MS - Determination of immunological and phenotyping parameters, including multiplex trials, through flow cytometry - Analysis of gene expression in response to Covid-19 infections using arrays - Imaging studies using high-performance confocal microscopy (32 channel spectral detector, high-resolution confocal detector)  - BCL2 animal facilities and Covid commercial models of rat and mouse.  Creation of data base in RedCap for the registration of information related to Covid - Express Statistical studies on the analysis and exploitation of data related with Covid
16	IDIPAZ	ES	Webpage: updated with bioinformatics resources related to COVID-19: <a href="http://www.clinbioinfospa.es/CovidResources">http://www.clinbioinfospa.es/CovidResources</a>

17	Fundacion Jimenez Diaz	ES	<p>Project: Mechanistic model based on artificial intelligence for the reuse of drugs against SARS-CoV-2 infection. Sent to the Urgent request for expressions of interest for extraordinary financing of research projects on SARS-VOC-2 and COVID-19 disease from the Spanish Agency Institute of Health Carlos III (ISCIII).</p> <p>Support and advice protocol for urgent care of SUMMA 112 to epileptic seizures at home during the pandemic COVID-19</p> <p>Statins after admission for positive COVID</p> <p>Epidemiological study of respiratory infections due to the new Coronavirus (SARS-CoV-2) in the pediatric population</p> <p>Investigating Prognostic factors that condition cardiovascular events after a viral respiratory infection. Adendum Patients COVID-19 positive, and in the follow-up the need for oxygen, non-invasive mechanical ventilation, ICU admission or orotracheal intubation</p> <p>Smartphone-based monitoring of mental health and psychosocial repercussions of the CoVid19</p> <p>STOP-Coronavirus: clinical, immunological, genomic, virological and bioethical factors of COVID-19</p> <p>Morphological and molecular characterization of lung in COVID-19 disease. Correlate with immune response.</p>
18	Wageningen University&Research,		<p>BSL 3 animal facilities, able to perform pre-clinical studies with laboratory species (mouse, hamster) and other species (ferret, pig); some species are currently under investigation in regard to suitability as animal model</p> <p>2- BSL 3 laboratory facilities for virological analysis, Covid related diagnostic procedures available, immunology and pathology facilities for various species</p>
19	University of Ljubljana		<p><b>New antiviral compounds against SARS-CoV-2</b> Serine protease inhibitors</p> <p>Recently, it has been discovered that the entry of SARS-CoV-2 virus into lung cells requires the angiotensin converting enzyme 2 (ACE2) to which the virus binds and the transmembrane serine protease 2 (TMPRSS2), which cleaves protein 5, thereby fusing cell membranes and viral envelopes and virus entry into the host cell. In vitro testing has shown that the use of an approved serine protease inhibitor (camostat) can prevent virus entry into Caco-2 and Vero-TMPRSS2 cells (1).</p> <p>At UL, the Faculty of Pharmacy are currently engaged in the synthesis and testing of novel narrow- and broad-spectrum serine protease inhibitors (human neutrophil elastase, cathepsin G, proteinase 3, trypsin and <math>\alpha</math>-chymotrypsin). It would be reasonable to test the activity of these inhibitors under in vitro conditions to prevent viral entry into cells. A similar approach to combating the spread of the virus has been successfully used in HIV-1 therapy with maraviroc (2).</p> <p>Sources:1. Hoffmann M, Kleine-Weber H, Schroeder S, et al. SARS-CoV-2 Cell Entry Depends on ACE2 and TMPRSS2 and Is Blocked by a Clinically Proven Protease Inhibitor. Cell. 2020. doi:10.1016/j.cell.2020.02.052</p> <p>2. Li G, De Clercq E. Therapeutic options for the 2019 novel coronavirus (2019-nCoV). Nat Rev Drug Discov. 2020. doi:10.1038/d41573-020-00016-0</p> <p>Cysteine protease inhibitors</p> <p>Very recently, an X-ray crystal structure of the complex between <math>\alpha</math>-ketoamide (peptide-based electrophilic compound) and one of the best characterized drug targets among coronaviruses, i.e. the main protease (Mpro, also called 3CLpro) was published (Zhang, L. et al. Science, March 20th 2020, eabb3405). It was also established that this compound inhibited the purified recombinant SARS-CoV-2 Mpro with IC50 = 0.67 <math>\pm</math> 0.18 <math>\mu</math>M. In human Calu3 cells infected with the novel coronavirus, SARS-CoV-2, an EC50 of 4 - 5 <math>\mu</math>M was observed.</p> <p>The expertise of the group at the Faculty of Pharmacy at the University of Ljubljana lies in the fragment-based development of covalent reversible or irreversible inhibitors of cysteine-bearing pharmacological targets; e.g. we recently developed an electrophilic fragment library useful for the experimental evaluation of the accessibility and reactivity of cysteines, tractable for covalent inhibition. More precisely, we equipped the single non-covalent fragment, i.e. the 3,5-bis(trifluoromethyl)phenyl group, a common motif in medicinal chemistry, with different warheads. The most represented chemistry subtype is the Michael-type conjugate nucleophilic addition (AdNM), followed by fragments acting in nucleophilic additions, nucleophilic substitution (SN). In addition, oxidation (Ox) and addition-elimination (AdN-E) reaction subtypes are also represented in this library. We were already able to characterize the accessibility and reactivity of targeted cysteines experimentally by screening the library against a set of enzymes that possess either catalytic or non-catalytic cysteine. Given the fact that such electrophilic fragments can be optimized into covalent inhibitors that are of non-peptidic chemical nature (providing several advantages over peptidic compounds, especially in terms of pharmacokinetic characteristics), this gives us the opportunity to develop compounds with completely innovative structures. These could prove very useful in targeting the COVID-19 pandemic caused by SARS-CoV-2.</p> <p>Investigations of molecular interactions between proteins and other molecules</p> <p>Development of a methodology that is also applicable to other molecular systems, such as COVID-19. They design and construct recombinant proteins useful for analytical or diagnostic applications. They have been developing innovative ways to prevent interactions by using small protein domains that can bind lipid molecules. In addition, model systems of lipid membranes are being developed and used.</p>
			<p>Characterization of pharmaceutical drugs known to affect COVID-19: Do ibuprofen and other NSAIDs exacerbate the COVID-19 disease course? Ibuprofen is a non-steroidal anti-inflammatory drug that is often prescribed to lower fever and relieve mild pain, such symptoms also associated with COVID-19. They want to test the recent hypothesis that ibuprofen exacerbates the clinical course of COVID-19. Ibuprofen increases the expression of ACE2 (angiotensin converting enzyme 2), which incidentally serves as an attachment point for the SARS-CoV-2 virus. It has therefore been hypothesized that ibuprofen may therefore worsen the course of COVID-19 disease by facilitating viral entry into the cells. At UL FFA, we want to help answer the question: Do ibuprofen and other NSAIDs worsen the course of COVID-19? Our study is aimed towards elucidation of the mechanism by which ibuprofen increases ACE2 expression and to determine whether other non-steroidal anti-inflammatories produce the same effect.</p>
			<p>Immunological studies of SARS-CoV-2 Monitoring of the onset and duration of immunity following clinical recovery from COVID-19 Reliable identification of persons with SARS-CoV-2 infection will be of paramount importance, since it can be concluded that they have developed immunity and are resistant to re-infection for at least some time. Individuals immune to SARS-CoV-2 (medical staff, civil protection, firefighters, soldiers, etc.) could greatly assist in the care of new patients, and in general be of assistance to vulnerable segments of the population. The current testing approach identifies infection only in severe patients, and it appears that a significant proportion of individuals can survive the disease in a very mild or even asymptomatic manner (1, 2). The only way to reliably identify individuals who developed immunity will be to determine the antibodies and/or memory immune cells generated in response to the infection. The situation is further complicated by the fact that the duration of immunity after the disease is currently unknown.</p> <p>To this end, we propose a project that would identify: (a) the dynamics (rate of onset and duration of protective concentration) of the presence of primary and secondary response antibodies and the presence of memory cells in serum or blood following SARS-CoV-2 infection, (b) differences in the dynamics of the presence of antibodies and memory cells in plasma following SARS-CoV-2 infection among patients with mild and severe form of disease, (c) identification of individuals with antibodies and asymptomatic infection, which would require broader serological testing within the general population. The presence of specific populations of memory cells, usually resulting from a viral infection, will be determined in blood samples by flow cytometry. We will focus on memory B cells, long-lived plasma cells and some subtypes of memory T cells.</p> <p>1. Qiu J. Covert coronavirus infections could be seeding new outbreaks. Nature 20 March 2020; doi: 10.1038/d41586-020-00822-x 2. Rothe C et al. Transmission of 2019-nCoV infection from an Asymptomatic Contact in Germany. March 5, 2020. N Engl J Med 2020; 382:970-971</p> <p>Development of innovative innate immune agonists as vaccine adjuvants The innate immune system is composed of different cell types, including dendritic cells (DCs), which contain a variety of pattern recognition receptors (PRRs), such as NOD2 and TLR7. Agonists of these receptors stimulate DCs to present antigens more effectively, while also providing signals that determine the type, size, and duration of the response obtained. They represent promising lead compounds for the development of new adjuvants. Adjuvants increase the immunogenicity of vaccines, making them a key component of modern vaccines by providing effective protective immunity against a particular pathogen. Simultaneous activation of selected PRRs enhances adjuvant activity, while the covalent coupling of multiple PRR agonists may further increase this activity. The project is developing conjugates with dual NOD2/TLR7 agonist activity and their liposomal formulations, as we have identified the potential for synergy between NOD2 and TLR7 agonists. Our key research objective is the development of innovative adjuvants that will potentially be used as components of effective therapeutic or prophylactic vaccines for treatment or prevention of highly contagious diseases, such as COVID-19, ultimately improving public health.</p>
20	IDIBAPS		<p>Severe COVID19 infection: prevalence, clinical characteristics and outcomes</p> <p>Extracorporeal membrane oxygenation for 2019 novel Coronavirus Acute Respiratory Disease</p> <p>Biomarkers identification to stratify severity in COVID19 patients (Corona-BIO)</p> <p>A Phase 3 Randomized Study to evaluate the Safety and Antiviral Activity of Remdesivir (GS-5734TM) in Participants with Severe COVID-19</p> <p>A Phase 3 Randomized Study to Evaluate the Safety and Antiviral Activity of Remdesivir (GS-5734TM) in Participants with Moderate COVID-19 Compared to Standard of Care Treatment</p> <p>Comparative study of the incidence, presentation, clinical evolution and prognostic factors of SARS-Cov-2 infection in people with or without HIV infection: case and control studies</p> <p>Identification and isolation of IgG Anti COVID-19 to produce antibodies as a treatment</p> <p>International registry of COVID-19 treatments and malignant arrhythmias</p>

			Seroprevalence study of SARS CoV 2 in the hospital context: immunological dynamics in one year follow-up
			Determination of the infectivity of SARS-CoV-2 in renals cells
			MIT Open Voice COVID-19 AI Dataset
			Outcomes of surgery in COVID-19 infection: international cohort study (CovidSurg)
			Pre-exposure prophylaxis with hydrochloroquine in high risk medical people durin the COVID-19 pandemy
			Creation of a digital tool to optimise the management of COVID19 patients
			Associated behaviour to a less emotional uncomfort during coronavirus pandemy confinement
			SARS-CoV-2 and Influenzavirus coinfection. Do we have to screen for COVID-19 in an Influenza virus infection case?
			Severe respiratory morbidity in CoVid19: susceptibility from early life? A prospective case-control study among severe vs. mild cases
			Randomised, double blind, controlled by placebo and multicentric study to evaluate the safety and efficacy of Tocilizumab in patients with severe penumonia and COVID19 disease
			Post exposure prophylaxis with hydroxychloroquine for household contacts of Covid-19 cases.
			Immune response gene variability and severe infection by SARS-COV-2 prediction
			Adaptative study Phase 2/3, randomised, double blind, controlled by placebo to evaluate the efficacy and safety of Sarilumab in COVID19 patients in hospitals
			Risk factors, personalised pronostic and follow-up of COVID19 patients in the Spanish Intensive Care units: CIBERESUCI COVID
			Predictive Value of ROTEM Analysis in severe COVID-19 Infection
			Timing of intubation in ARDS COVID patients
			Randomised pilot study to use convalescent plasma in COVID19 patients.
			Darunavir/cobicistat/TAF/ETC postexposure prophylaxis for close contacts of patients with COVID-19
			Preclinical development of innovative mRNA/MVA vaccines against SARScoV2
			Echocardiograph follow up of pregnants with COVID19 infection. Associated risks with severe infection and pregnancy trimester 5
			Short, mid and lon term effect of Coronavirus 19 disease in the cardiovascular system.
21	IRCCS ISMETT and Fondazione RI.MED	IT	ECMOCARD: international multicenter retrospective observational clinical study. Promoter: University of Queensland-Australia. Study to evaluate the treatment with ECMO (extracorporeal membrane oxygenation) in patients with COVID-19
			Multicenter study on the efficacy and tolerability of tocilizumab in the treatment of patients with COVID-19. This a national multicenter prospective observational clinical study. Promoter: Istituto Nazionale dei Tumori di Napoli
			COVID-19 and SOTR: international multicenter prospective observational clinical study. Promoter: University Hospital Virgen del Rocío Spain. Study to evaluate the effect of COVID-19 in transplanted patients
			CARDIO-COVID RISK: national multicenter prospective observational clinical study. Promoter: IRCCS, ISTITUTO AUXOLOGICO ITALIANO, Universta Milano Bicocca e Rete Cardiologica IRCCS. Study to evaluate the cardiovascular risk in COVID-19 patients
			20 ICU beds to treat severe COVID-19 patients
			ECMO for patients with severe COVID 19-pneumonia
			Bioinformatics
			Bioengineering
			Biophysics and Structural Biology
			Computer Aided Drug Design
			High Throughput screening
			Genomics
			Proteomics
			Magnetic Resonance Imaging
			GMP production
22	Istituto Superiore di Sanità	IT	Coordinates a surveillance system integrating microbiological and epidemiological data from Italian regions and from the ISS national reference laboratory for SARS-CoV-2 that confirm COVID diagnosis and perform genomic analysis.
			Working groups on different topics have been created (information and communication, education and training, medical devices, infection control, drugs, immunology, epidemiology)
			External triage structure to screen all patients entering institution; design specific procedures to manage people flow in and out the hospital.
			Design of different clinical protocols to assist patients with special needs and in general ensuring all the necessary clinical assistance; evaluate the epidemiology of the infection by performing rapid tests to both clinicians and cancer patients
			Study to genetic variability in development
23	National Center for Infectious and Parasitic Diseases	BG	Genetic virology tests
			National reference services in the diagnostics of the infected persons
			Biomarkers of dysregulated and protective immune response in COVID-19 patients. We are currently conducting multiparameter analysis of the effector and regulatory subsets driving the cellular and humoral immune responses in SARS-CoV-2 positive patients at different terms and with varying severity of infection. Cellular phenotypes will be tested alongside with cytokine expression and SARS-CoV-2 specific antibody titers. Our hypothesis is that a poor outcome results from an early and predictable dysregulation of the balanced differentiation of Th1/Th2/Th17 and Treg subsets, leading to inefficient antiviral cytotoxicity and over production of proinflammatory cytokines. Our aim is to define the "footprint" of protective vs. inefficient immunity, that will serve monitoring, prognosis and testing of vaccinal and immunomodulatory prototypes. In parallel we are preparing a stock of isolated mononuclear cells and sera samples that could be used in further projects for antigen characterization, pre-clinical validation, and clinical development of vaccines or therapeutic preparations
			Phylogenetic analysis of COVID-19 lineages circulating in Bulgaria by means of shotgun NGS analysis. Various samples from symptomatic and asymptomatic patients will be studied in order to associate potential mutations related to pathogenesis.
			Development of rapid and cost-effective diagnostic assays based on Loop-mediated isothermal amplification (LAMP) with direct application without the need for prior RNA extraction and/or minimal sample processing.
24	Ramon & Cajal Health Research Institute (IRYCIS)	ES	Clinical trial to assess corticosteroid efficacy in treating a COVID-19 subgroup of patients.
			Study of clinical, genetic and metabolic factors of patients aimed at giving personalized treatment
			Computational models applied to the epidemiological study of the disease and as a predictive tool to design COVID-19 patient management
			Development of aptamers for therapeutic purposes in COVID-19
			Multi-approach epidemiology, diagnosis and therapy by drug repositioning
			Building of a RedCap data base for COVID-19 patients, including clinical and molecular data
25	University of Lisboa	PT	Currently reinforcing the Covid-19 testing capacity with 300 tests / day and scaling up to 750 / day, in strict articulation with Hospital de Santa Maria (one of the first-line central hospitals to treat Covid-19), where they are based. With this diagnostic campaign they will be collecting and processing patient samples through their biobank.
			Biomarker discovery: specific detection of viral nucleic acids (including RNA extraction, primer set optimisation and eventual adjustments to natural virus sequence variation); specific detection of antibodies for immunoassays (including production of SARS-CoV-2 protein and antigens coating)
			Validation of sensitivity and specificity of assays to detect virus infection (nucleic acid detection) and immunological status (virus specific seroconversion)
			Development of in vitro and in vivo infection models to identify novel therapeutic targets and study the safety and efficacy of treatments
			Vaccine design and development
			Clinical trials of novel Covid-19 treatments
			Epidemiologic studies

26	Leiden University Medical Center	NL	The virology lab at LUMC (www.lumc.nl) has been working on SARS-CoV and MERS-CoV since these emerged in the human population, and they do a combination of basic and more translational research on these viruses. They focus on thoroughly understanding these viruses and their interactions with host cells, and use this knowledge to develop innovative antiviral strategies, including vaccines and antivirals. Analyses of infections in both cell culture as well as mouse models are possible in their BSL-3 facilities, including testing the efficacy of vaccines and antivirals. This expertise and experience will be instrumental for the consortium
27	University of Helsinki/FIMM	FI	Developed virus tests to detect infected people (collaboration with UH dept. of Virology) Developed Serological Tests to detect people who already have protective antibodies against SARS-CoV-2 virus (collaboration with UH dept. of Virology) Drug development (small molecules, antibodies) (collaboration with UH dept. of Virology) Human genetics to understand why some people get serious COVID-19 symptoms Virus sequencing (collaboration with UH dept. of Virology) Communication and effort facilitation, problem solving (network, public, government, funding bodies, Bio-Industry) (industry, FIMM, collaboration with UH/Dept. Virology)
28	AIBILI-Coimbra	PT	Regulatory Support. Personnel available to perform submission (according to the fast-track procedure), contracts negotiation (agreements), monitoring activities, remote monitoring and can setup on-site visits if needed Data Centre (certified by ECRIN-ERIC) able to develop/provide eCRF and data management activities.
29	Instituto de Investigación Biomédica de Málaga (IBIMA)	ES	Randomized phase 3 study to assess the safety and antiviral activity of remdesivir (GS-5734TM) in participants with severe COVID-19 infection. Sponsor: Gilead Sciences Randomized phase 3 study to assess the safety and antiviral activity of remdesivir (GS-5734TM) in participants with moderate COVID-19 infection. Sponsor: Gilead Sciences
30	Health RI	NL	Data services and tools to facilitate COVID-19 research - Finding the right data sets, curating them where necessary, making them accessible to researchers, linking - data from many different sources and making rich data sets reusable often is nontrivial. Making data findable Health-RI is inventorying existing COVID-19 related data collections, images and samples. As a next step, all relevant data sets will be labeled as 'COVID-19' in BBMRI.NL catalogue. In time, new data sets will be added and enhanced with information on what specifics make these data or samples relevant. -Providing access to data Podium, a 'webshop' system will give access to data collections, efficiently and safely. It can be used by researchers and organizations alike to manage and facilitate the research request workflow of data/samples/images. -Making data interoperable Data are located at various places. Health-RI can help researchers with using the Personal Health Train principles to make optimal use of the distributed data. Health-RI also offers expertise on more traditional methods of connecting data. -Sharing Radiology images Health-RI hosts and supports a solid pipeline for managing large quantities of radiology images, pseudonymisation of DICOM images and making these available for research (CTP and XNAT). -ELSI service desk To answer questions about Ethical, Legal and Social Implications. Important if you want to use health data for research purposes, particularly in the current context of COVID-19. For example, someone who is on life support will not be able to give consent for research purposes.
			CAPACITY registry - CAPACITY is a registry of patients with COVID-19 across Europe and has been established to answer questions on the role of cardiovascular disease in this pandemic. It is an extension of the Case Record Form (CRF) that was released by the ISARIC (International Severe Acute Respiratory and Emerging Infection Consortium) and WHO (World Health Organisation) in response to the emerging outbreak of COVID-19.
			WikiPathways COVID-19- Collaborative project for curation biological processes involved in the COVID-19 disease after SARS-Cov-2 infection
			COVID-19 Disease Map- An international initiative to build disease maps, molecular biological pathways, and pathway-based models for virus-host interactions and affected processes. The initiative spans many groups including the WikiPathways and Reactome teams, the DisGeNET team, FAIRdom, and Cell Designer and is led by the MINERVA disease map team in Luxembourg.
			RIVM Databronnen COVID-19 overzicht (available in Dutch only)- The Dutch Ministry of Health, Wellbeing and Sport provides the Dutch overview of data sources related to the coronavirus and the associated clinical picture of COVID-19 (available in Dutch only).
			Stichting Corona in Kaart Brengen (available in Dutch only)- The 'Stichting Corona in Kaart Brengen' collects data reported by general practitioners and the public in order to provide better insight into the disease distribution of COVID-19 (available in Dutch only)
			I2b2 tranSMART community COVID-19 call to action- The I2b2 community is working to combine national and international analyses of the COVID-19 affliction on its patients. Dr. Zak
			Lifelines coronavirus study- Participants of the Lifelines and Lifelines NEXT research programmes are invited to contribute to the Lifelines coronavirus study which is a joint initiative of the University Medical Center Groningen, the University of Groningen, the Aletta Jacobs School of Public Health and the Lifelines biobank.
			The COVID-19 Host Genetics Initiative- The COVID-19 host genetics initiative brings together the human genetics community to generate, share and analyze data to learn the genetic determinants of COVID-19 susceptibility, severity and outcomes. This initiative includes several Dutch and European biobanks.
			COVID-19 (coronavirus disease)- Fertility and Pregnancy- Collection published data on perinatal outcomes in women with confirmed COVID-19
31	University of Modena and Reggio Emilia	IT	Can provide ex-vivo human airway models for testing drugs and for virus - cells interaction. The models are 3D engineered human airway tissues, from different donors, containing ciliated cells as well as the other differentiation lineages. This group can provide if needed, for drug or virus interaction studies, or can test the effect produced on the tissue. Specifically, can provide human airway tissue, highly proliferating or fully differentiated with clara, goblet, epithelial and ciliated cells, for testing. These tissues can be available from three different donors. They can provide the tissue, the lab receiving the tissue should administer the virus and the drugs; they can lyse the tissues or fix them and then can analyze results only after lysis or fixation (i.e. after viral inactivation), since they do not have the possibility to insert living coronavirus infected cells in the lab. They can provide reagents, methods and suggestions for the short intermediate step in the receiving lab or in a lab equipped for living virus infected cells handling.
32	Inserm	FR	Participates in research about CoVid19 by giving access to their neuroinflammation platform for the assessment of infected blood samples: <a href="http://www.neuroinflammation.fr/">http://www.neuroinflammation.fr/</a>
33	The Institute for Health Science Research Germans Trias i Pujol (IGTP)	ES	Testing of respiratory devices 1) RESPIRA developed by GAPInnova and 2) OxyGEN developed by Prototyf.xyz 3) GasN2 autonomous ventilation device (DAR) In vivo validation of new devices for invasive ventilation (3 models as above) ABSL3 facilities for Research on animal models BSL3 facilities for Research on in vitro models Diagnostic Platform to evaluate and clinically validate new technology and introduce them into the diagnostic routine immediately: 1) To evaluate the usefulness of a system for collecting and transporting samples, which preserves viral RNA to facilitate the screening of patients and contacts throughout the territory. 2) To assess rapid tests (point-of-care) for detecting viral antigens as a screening system. 3) To validate and evaluate molecular techniques for detecting viral genetic material.

			4) To increase the knowledge of the immune response to the virus, in order to better assess the response to the infection, to the treatment and also in the post-infection period. We assess the response mounted by B-cells and T-cells, and we will explore the role of the oxidative stress during the COVID19.
34	Biodonostia	ES	<ul style="list-style-type: none"> <li>-An international randomized trial to evaluate unlicensed treatments for COVID-19 in hospitalized patients receiving conventional treatment for COVID offered at each hospital.</li> <li>- Clinical Trial: Use of colchicine for the prevention of the inflammatory response in COVID-19 infection.</li> <li>- Coronavirus detection using oligonucleotide probe in clinical samples of symptomatic and asymptomatic patients.</li> <li>-Diagnosis of COVID-19 by PCR in 15 minutes for use in hospitals and health centres.</li> <li>-Design and preclinical evaluation of ACE2 sub-domains as antiviral against SARS-CoV-2.</li> <li>-Immunosenescence as a risk factor for SARS-CoV-2 infection.</li> <li>-Molecular approach to identify the impact of coronavirus.</li> <li>-Search for SARS-CoV2-susceptible polymorphisms.</li> <li>-Identification of molecular alterations associated with the presence of coronavirus.</li> </ul>
35	INCLIVA	ES	<ul style="list-style-type: none"> <li>-NEURO-COVID-19 Study : Acute Encephalopathy in critically ill patients with SARS-COV-2 infection.</li> <li>-Evaluation of the efficacy of different treatments in hospitalized COVID19 patients.</li> <li>-CovidSurg-Cancer: an international cohort study assessing the safety of surgery for all types of cancer during the COVID-19 pandemic and the impact of the pandemic in cancer delay and treatment pathways.</li> <li>-Sevoflurane for Sedation in Acute Respiratory Distress Syndrome: A Multicenter Prospective Randomized Trial</li> <li>-Clinical Trial for the prevention of Coronavirus infection in health workers</li> <li>-Development of a diagnostic kit to determine the presence of the SARS-Cov-2 in patients and the particular strain.</li> </ul>
36	TNO	NL	<p>Molecular biology:</p> <ul style="list-style-type: none"> <li>-Infrastructure for sample handling (BSL2/liquid handlers)</li> <li>-SARS CoV-2 RT-qPCR</li> <li>-Development of isothermal detection methods for SARS CoV-2</li> <li>-LAMP based point of care testing</li> <li>-Next Gen Sequencing</li> <li>-LAMP-seq: Mass sequencing of barcoded LAMP products</li> </ul> <p>Personal protection device testing</p> <ul style="list-style-type: none"> <li>-Particle Filtration Efficiency (PFE) Test of masks and clothing</li> </ul>
37	Institut du Cerveau	FR	Cohorte Covid – Neurosciences. This study will be lead on 2000 to 10 000 patients from April 2020 to April 2021. <a href="https://icm-institute.org/fr/actualite/projet-neuro-covid-19/">https://icm-institute.org/fr/actualite/projet-neuro-covid-19/</a>
38	RadboudUMC	NL	<ul style="list-style-type: none"> <li>Nederland COVID-19 Initiatief (NCIF) voor radiologische beelden (Dutch only)</li> <li>MuCo study</li> <li>Clinical features of SARS-CoV-2 (CliniCo)</li> </ul>