

PRESS RELEASE

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IDEXLYON SUPPORTS COVID-19 RESEARCH: 16 PROJECTS LED BY RESEARCHERS FROM THE UNIVERSITÉ DE LYON FUNDED FOR €1M

The Université de Lyon, via the IDEXLYON project, will fund research projects with the potential to provide short or medium-term solutions to the Covid-19 crisis.

From the start of the Covid-19 epidemic, the entire French research community, from life sciences to human and social sciences, has been working hard to develop effective treatments against the spread of the virus, as well as to assess the social, economic and environmental impact of this crisis.

Researchers at the Université de Lyon have launched a number of research projects that could provide solutions to the Covid-19 crisis. More than 40 projects were submitted, and on May 26, 2020, the [IDEXLYON Executive Committee](#) (COMEX) selected 16 of them for funding.

The selected projects focus on issues such as: consequences of the disease (loss of smell and/or taste, severe fatigue, etc.); lockdown effect on mental health, and how people have learned to cope with the epidemic at work, at home and out in the community. There are also studies involving creating a model based on artificial intelligence to predict patient outcomes as soon as they are admitted to the emergency room, as well as designing a stand-alone medical device production unit using 3D printing.

These projects have been developed by researchers from the Université de Lyon's member and associated institutions: Université Claude Bernard Lyon 1, Université Lumière Lyon 2, Université Jean Moulin Lyon 3, Université Jean Monnet, ENS de Lyon, INSA Lyon, ENISE, CNRS, Inserm, INRA, VetAgro Sup, ENTPE, École Centrale and Inria. Most of these research projects will be carried out in close

collaboration with health care facilities. These include the Hospices civils de Lyon, the Saint-Étienne University Hospital (Centre hospitalier universitaire) and the Vinatier Hospital.

Identifying and treating chronic fatigue in Covid-19 patients

- **Project leader:** Guillaume Millet, Université Jean Monnet

Early reports from clinicians who have treated Covid-19 patients show that they experience extremely high levels of fatigue. Severe fatigue has also been reported in patients hospitalized in the Covid+ unit, and even in non-hospitalized patients. Fatigue can lead to a vicious cycle of inactive or sedentary behavior that ultimately affects patients' quality of life and their return to work. This project aims to explore extensively the specific causes of fatigue (sleep problems, cardiorespiratory deconditioning, brain excitability, muscle function, inflammation, etc.) and to study how the patient recovers after six months. Perceived fatigue and other related factors (e.g. stress, depression and physical activity) will also be continuously monitored using a tool that has been specifically developed for this project.

Confine-Covid-19 - Digitally simulating the end of lockdown

- **Project leader:** Pascal Roy, Biometrics and Evolutionary Biology Laboratory (*Laboratoire*

de biométrie et biologie évolutive – LBBE)

The “Confine-Covid-19 – digitally simulating the end of lockdown” project combines (1) a simulation of the Covid-19 epidemic before, during, and after the lockdown, and (2) simulations to assess how the measures taken to control the epidemic coming out of lockdown (i.e. wearing masks, screening/case isolation and contact tracing), while taking into account diagnostic test performance. This project involves some 40 researchers from Lyon (LBBE, LSAF, ECL, LIRIS, ICJ, CIRI, HCL and Inria), Rouen and Nice.

CORODORAT - Loss of smell and taste during the Covid-19 health crisis: description, effects on quality of life and treatment

- **Project leaders:** Camille Ferdenzi and Moustafa Bensafi, Lyon Neuroscience Research Center and the Vinatier Hospital

One of the most striking symptoms of Covid-19 is the loss of one’s sense of smell and taste. The CORODORAT project aims to clearly identify these sensory problems and how they affect patients’ quality of life using large-scale questionnaires and clinical psychophysical testing. These developments will be used to provide diagnostic support strategies for Covid-19 and to improve patients’ quality of life by helping them regain their sense of smell.

Covid-CTPRED

- **Project leader:** Pierre Croisille, CREATIS Biomedical Imaging Research Laboratory (*Centre de recherche en acquisition et traitement de l’image pour la santé*), Saint-Étienne University Hospital

By combining Covid’s specific “signature”, which can be determined from a chest CT scan, with clinical and laboratory data, the Covid-CTPRED project aims to predict patient outcomes based solely on emergency department patient records. This model uses artificial intelligence techniques to predict potential hospital and intensive care admissions and associated complications with a view to improving hospital care.

CovidAC - Covid-19 and pets

- **Project leader:** Vincent Legros, International Infectious Disease Research Center (*Centre international de recherche en infectiologie – CIRI*)

The CovidAC project aims to shed light on the potential role of pets (dogs, cats, ferrets, etc.) in relation to SARS-CoV-2 (the virus responsible for the Covid-19 pandemic) amidst the massive epidemic that is currently sweeping across Europe, particularly in France. It aims to provide a basis for assessing how common the disease is in pets, to identify possible symptoms and to determine potential risks to humans.

COVIMOB – Urban transport in the midst of the health crisis

- **Project leader:** Stéphanie Vincent, Laboratory of Transport Economics (*Laboratoire d’aménagement économie transports – LAET*)

The COVIMOB project, led by the LAET, focuses on changes in transit behavior in Lyon and the Rhône department because of the Covid-19 health crisis. This project examines changes in number of travelers, the choice of transportation method, the development of teleservices and teleworking, as well the impact on future housing choices. It also explores whether these changes will continue after the crisis.

Study of immunological mechanisms associated with Covid-19 worsening in obese and/or diabetic patients

HPI-Covid - Host-pathogen interactions during paediatric and adult SARS-CoV-2 infection

RICO - Studying immune response kinetics in adult patients infected with SARS-CoV-2 while in intensive care units (...)

- **Project leaders:** Assia Eljaafari, Florent Valour, Thierry Walzer and Fabienne Venet, International Infectious Disease Research

Center (*Centre international de recherche en infectiologie – CIRI*)

These three projects, led by teams at the CIRI research center, focus on studying immune responses in patients with SARS-CoV-2 and understanding what factors may cause severe disease progression, with a particular focus on obese and diabetic patients. To this end, researchers will analyze the innate (interferons, NK cells, etc.) and adaptive (T-cells and antibodies) response mechanisms and compare them with clinical data in order to identify prognostic markers and new treatment options.

HUMAN19 - Digital additive manufacturing mobile unit for hospitals

- **Project leader:** Philippe Bertrand, Tribology and System Dynamics Laboratory (*Laboratoire de tribologie et dynamique des systèmes – LTDS*)

3D printing has provided a quick and efficient response to a number of requests from healthcare professionals during the Covid-19 crisis. It has saved lives, provided protection for medical staff and improved patient recovery. The HUMAN19 project aims to set up a mobile manufacturing unit located within a University Hospital. This stand-alone facility will manage the entire medical device manufacturing chain, using additive manufacturing technologies; spanning everything from the design to the final product.

INTERLUDE - Investigating lockdown and its effects on everyday life

- **Project leader:** Lise Bourdeau-Lepage, Environment, City and Society Laboratory (*laboratoire Environnement ville société – EVS*)

The main aim of the INTERLUDE research project is to identify how the daily lives of French people have changed during the Coronavirus lockdown and to assess how it has affected their well-being and mental health. These changes include daily patterns, lifestyle habits (such as grocery shopping and sports), social interactions, working conditions, employment status, and much more. It was launched at the beginning of the health crisis and has surveyed more than 12,500 people.

MetaEvidence Covid

- **Project leader:** Michel Cucherat, Biometrics and Evolutionary Biology Laboratory (*Laboratoire de biométrie et biologie évolutive – LBBE*)

[MetaEvidence Covid](#) provides online access to up-to-date Covid-19 treatment effectiveness data. All treatment trial results are semi-automatically analyzed and synthesized by a dynamic meta-analysis using AI tools. The aim of the project is to produce a sound evidence base for developing treatment strategies as quickly as possible.

RAR2C - Social perception, adaptation, risks, cancer and Covid

- **Project leader:** Marie Préau, Social Psychology Research Group (*Groupe de recherche en psychologie sociale – GREPS*)

The RAR2C project will look at how people have adapted to cope with the SARS-CoV-2 epidemic in the workplace, socially, and at home. The aim is to understand how living with cancer, whether as a patient or in a loved one, can affect attitudes, risk perception and behavior, as well as the relationship between teleworking and people with or without cancer, using the Seintinelles participatory research platform. Two data collection tools, an online questionnaire and a lockdown diary, were used to gather information.

RDS for SARS-CoV-2

- **Project leader:** Delphine Maucort-Boulch, Biometrics and Evolutionary Biology Laboratory (*Laboratoire de biométrie et biologie évolutive – LBBE*)

The Covid-19 outbreak has resulted in the significant mobilization and redistribution of healthcare resources, which could have an impact on healthcare services. This could be the cause of increased morbidity and mortality rates in non-Covid medical conditions. The project will assess the impact of the Covid-19 outbreak on how quickly patients with serious medical or surgical problems are treated in comparison to previous years.

Legally regulating the media during and after the pandemic phase

- **Project leader:** Béatrice Eespesson-Vergeat, Critical Legal Research Center (*Centre des recherches critiques sur le droit – CeRCriD*), Université Jean Monnet

The considerable amount of false information surrounding Covid-19 prompted the WHO to declare this “infodemic” as a public health emergency. The research focuses on the legal aspects of media guidance and monitoring the “infodemic” during the Covid-19 outbreak. This research, conducted by a multidisciplinary team at the CeRCriD, will be followed by studies and textual surveys and will eventually lead to conferences, publications and science popularizing books.

RhinoCell - Studying Rhinolophidae at cellular level – the natural SARS-CoV-2 carriers

- **Project leader:** Bertrand Pain, Stem Cell and Brain Research Institute (*SBRI*)

The current outbreak is caused by the SARS-CoV-2 virus, which, like its predecessors, SARS-CoV and MERS-CoV, is a Coronavirus that is believed to naturally spread among bats. Unlike humans, bats do not show any symptoms. This project aims to develop the most accurate *in vitro* models with a view to studying and understanding the interactions between this new SARS-CoV-2 virus and its natural host, Horseshoe bats (genus *Rhinolophus*), at a cellular level.

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About us

The **Université de Lyon** is a world-class academic site of excellence. Awarded the IDEX label in 2017, it is located at the heart of the Auvergne-Rhône-Alpes region, in Lyon & Saint-Étienne. Structured around 12 member institutions and several associated institutions, the Université de Lyon has three main objectives: to be a major, attractive and responsible university, with a reputation for excellence and innovation, and one which is enriched by strong international outreach; to provide outstanding training and research opportunities, in line with current social expectations and changes; to develop and promote the dynamics of the Lyon Saint-Étienne site, in conjunction with all regional stakeholders: citizens, organizations, companies and local authorities (the metropolises of Lyon and Saint-Étienne, the Région Auvergne-Rhône-Alpes and other regional authorities).

More information:

<http://www.universite-lyon.fr>

IDEX is a call for projects launched by the French National Research Agency (ANR) and the Commissariat-General for Investment (CGI) under the Investments for the Future program. The Université de Lyon was awarded The "Excellence Initiative" label in February 2017. This project, which is driven by a powerful collective impetus, demonstrates the Université de Lyon's strengths and aims to enhance the site's dynamic of excellence: its research outreach, the attractiveness of its training programs, its academic potential and the quality of its governance.

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