



European Strategy Forum
on Research Infrastructures

Overview of Biomed Research Infrastructure in EU

Response to COVID-19 pandemics

Radislav Sedlacek

Czech Centre for Phenogenomics, Institute of Molecular Genetics (CZ)

ESFRI, Health & Food strategy working group

18-Jan-22

ESFRI Roadmap 2021

European Strategy Forum
on Research Infrastructures

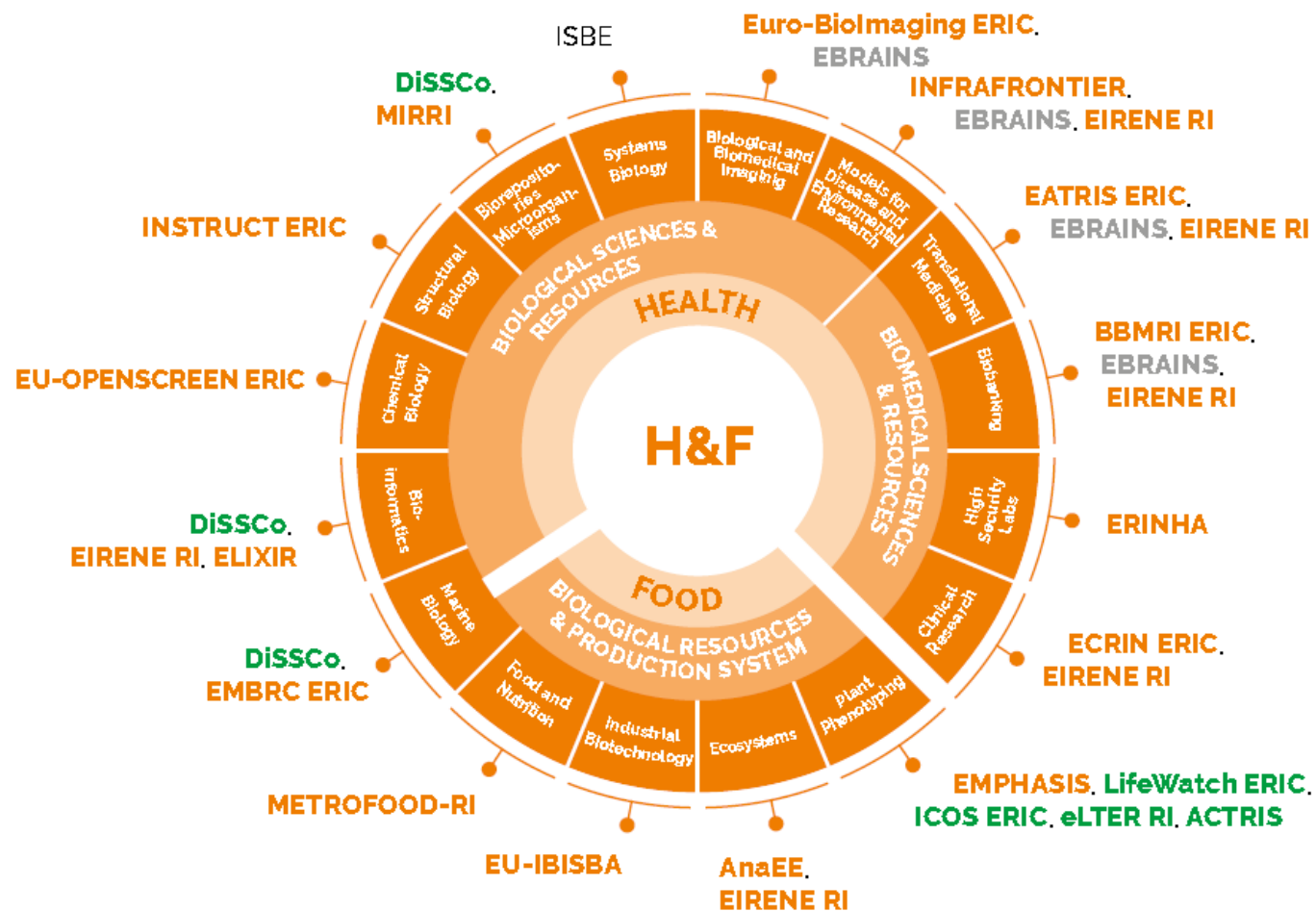


ROADMAP 2021
**STRATEGY
REPORT
ON RESEARCH
INFRASTRUCTURES**

ROADMAP 2021
**STRATEGY
REPORT
ON RESEARCH
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Health & Food



Health & Food : biomedical RIs



European Research Infrastructure
on Highly Pathogenic Agents



The background of the slide is a complex, colorful microscopic image. It features a dense field of cells and structures, with prominent red and blue hues. The structures appear to be interconnected, forming a network-like pattern. The overall appearance is that of a biological or medical specimen, possibly related to the COVID-19 pandemic mentioned in the text.

Biomedical Research Infrastructures

RESPONSE TO COVID-19 PANDEMICS: SELECTION OF ACTIVITIES

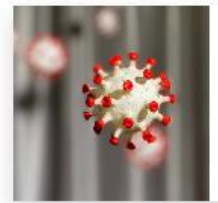
Biomedical Research Infrastructures



eatris

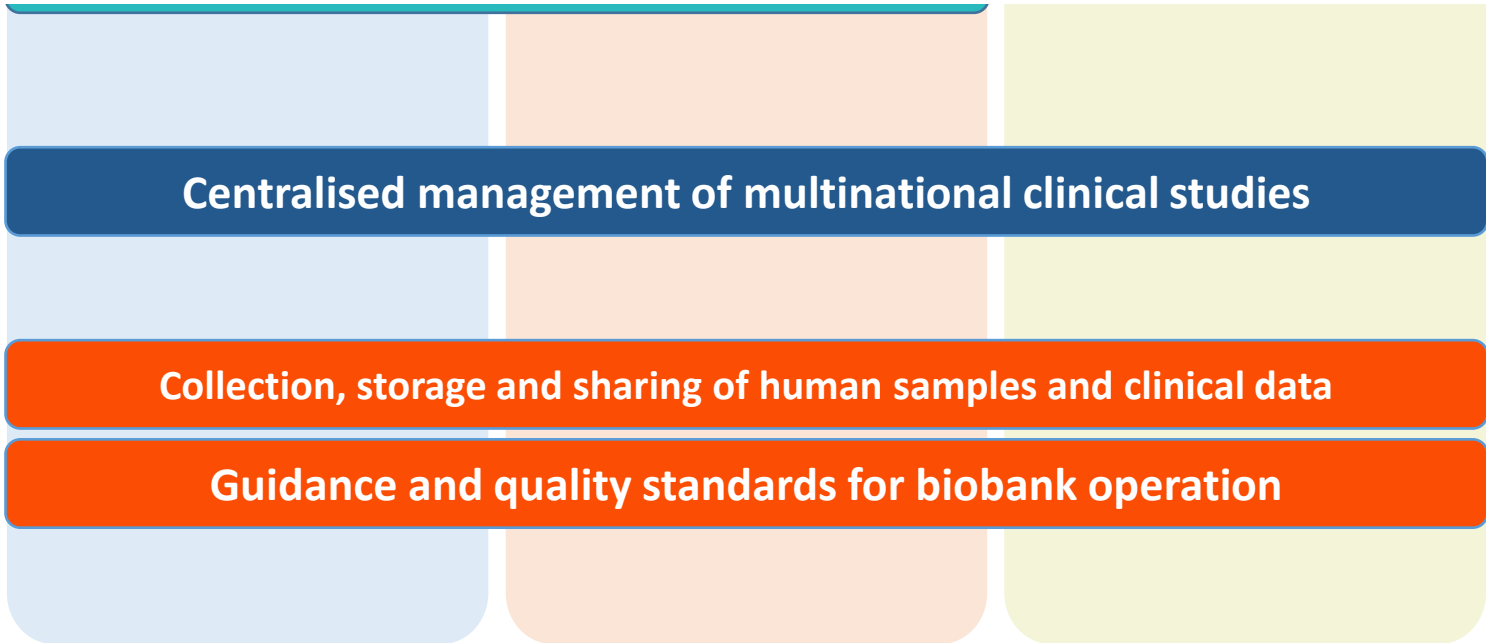


New COVID-19 test by IMTM draws global attention



New biomarker for severe COVID-19 found at Karolinska Institutet, an EATRIS institute

ECRIN
EUROPEAN CLINICAL RESEARCH
INFRASTRUCTURE NETWORK



BBMRI
Biobanking and
Biomolecular
Resources Research
Infrastructure

AMRI service pipeline for COVID-19 research and development

<https://eatris.eu/insights/covid-19-pandemic-readiness-european-medical-research-infrastructures-are-part-of-the-global-response/>

ECRIN IN THE COVID-19 OUTBREAK

<https://ecrin.org/covid-19-taskforce>

- **Toolbox**
 - Literature review
 - Funding opportunities
 - Regulatory / ethical context
 - Fast-track procedures
 - COVID trial registries
- Launch of **ECRIN clinical trial metadata repository**
- COVID19 clinical trial GDPR-compliant **data sharing platform**
 - part of EU COVID data portal, EOSC-Life WP14
- **Toolbox to design and manage platform trials**
 - EU-RESPONSE WP3 & RECOVER WP9

Related information

- > Clinical Research Metadata Repository
- > COVID-19 Literature reviews
- > Funding calls
- > COVID-19 Trials registries
- > Fast track procedures for COVID-19 clinical trials
- > Regulatory – ethical considerations for ongoing trials during Pandemic
- > Other COVID-19 resources
- > European Research Infrastructures against COVID-19

ECRIN in multinational COVID19 trials

design, planning, regulatory/ethical support, monitoring, data management and sharing

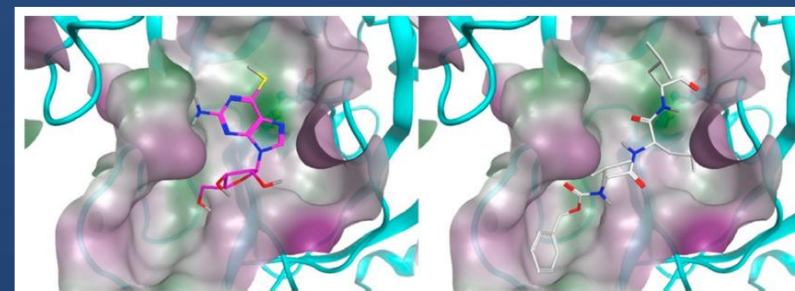
- **H2020 EU-RESPONSE**
 - DisCoVeRy : pan-EU expansion of platform trial
 - SolidAct : new platform trial for drug registration (moderate or severe COVID)
- **H2020 RECOVER**
 - REMAP-COVID multidomain platform trial
- **H2020 VACCELERATE**
 - Vaccine trial network -> master protocols, support to vaccine trials
- **Coordination of clinical research : common work package led by ECRIN**
 - Trial Coordination Board : dialogue between all large trials and stakeholders
 - Joint Access Mechanism : access to all large platform trials for new arms
 - Trial marketplace : connect investigators to avoid duplication of trials

: RI for Chemical Biology & early Drug Discovery

- > 20 affiliated high-throughput screening (HTS) and medicinal chemistry facilities
- High-content screening (HCS) and HTS of small molecule libraries to identify SARS-CoV-2 inhibitors
- Open access to COVID-19 data: ECBD and COVID-19 Data Portal
- Structure-based drug discovery
 - Fragment screening against SARS-CoV-2 targets in collaboration with iNEXT-Discovery/ INSTRUMENT partners



- Drug repurposing
 - Fraunhofer: partner in Exscalate4CoV (H2020-SC1-PHE-CORONAVIRUS-2020 emergency call)



Identification of several inhibitors of SARS CoV-2 MPro from EU-OPENSREEN Bioactives library

ACS Pharmacol. Transl. Sci. 2021,
doi: 10.1021/acspsci.0c00216

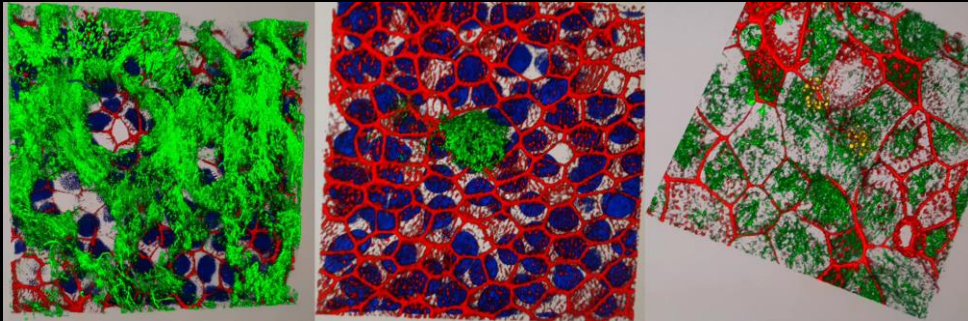
Novel binders to the Nsp3 Macrodomein 1 of SARS-CoV-2 from crystallographic screen with EU-OPENSREEN fragment library

More info @ <https://www.eu-openscreen.eu/covid-19/eu-openscreen-eric>



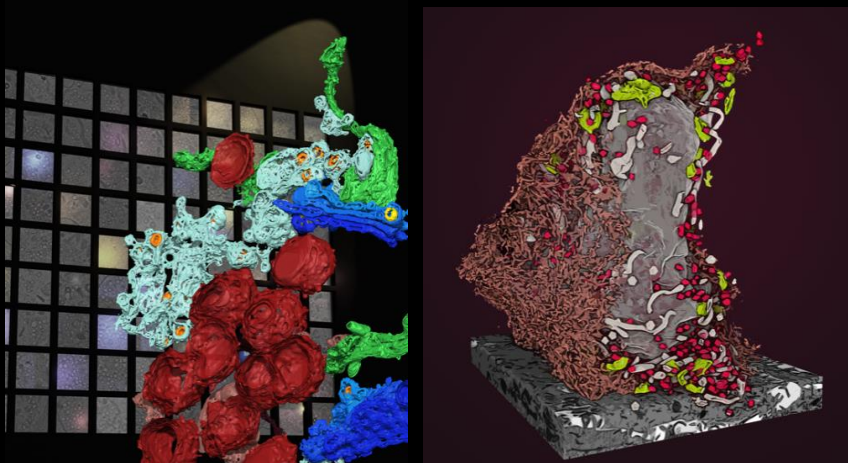
Light & electron microscopy technologies

- Underpin research on SARS-CoV-2, incl. viral lifecycle, host-pathogen interaction, and they shed light on disease progress



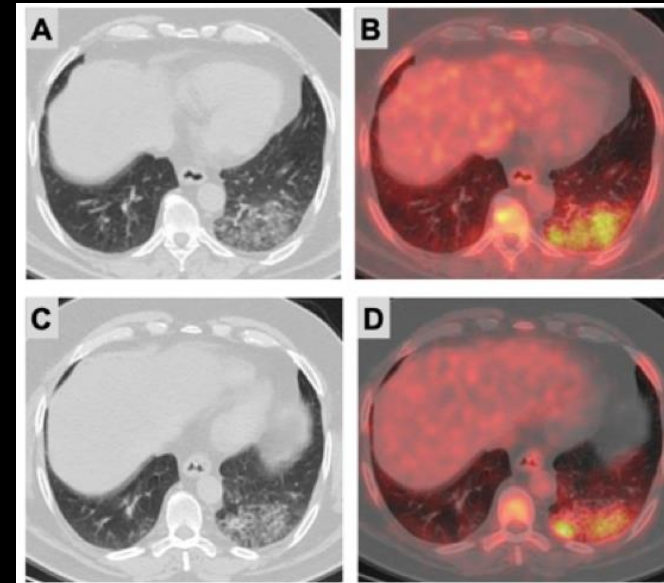
From our French Node:
Fluorescent imaging techniques to understand COVID-19 infection and inflammatory response

From our EMBL Node:
Understanding SARS-CoV-2 replication cycle in human cells



Medical imaging technologies

- Assess disease progression in patients, reveal the biodistribution of vaccines after administration and more



From our MMMI Italian Node:

Why FDG-PET/CT imaging is important to COVID-19 diagnosis

Image credits:
Top left: University of Bordeaux,
Bottom left & right: Giulia Mizzon, EMCF, EMBL, Julian Hennies, Schwab team, EMBL, Top right: University Federico II of Naples

Learn more :
<https://www.eurobioimaging.eu/content/Covid19>

Biomedical Research Infrastructures

erinha

European Research Infrastructure
on Highly Pathogenic Agents

Mission

ERINHA's mission is to advance research on high consequence (re)emerging diseases and to contribute to protecting human health by increasing Europe's preparedness for and capability to respond to highly pathogenic infectious threats.

- **In vitro research capacity includes but is not limited to**

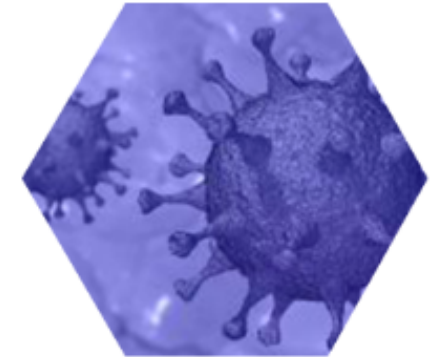
- standard virologic assays
- high-throughput SARS-CoV-2 antiviral/therapeutic screening assays
- diagnostic development and testing capacity
- virus propagation and quantification
- development of new in vitro assays / methods in accordance with the User's needs

- **In vivo research capacity includes but is not limited to:**

- Hamster disease model
- Standard in vivo virologic and immunological assays
- Pre-clinical vaccines and therapeutics testing
- Development of new animal models / in vivo methods in accordance with the User's needs

- **Additionally, ERINHA provides support for:**

- Coordination of pre-clinical research activities
- Project management
- Research protocols and experimental design

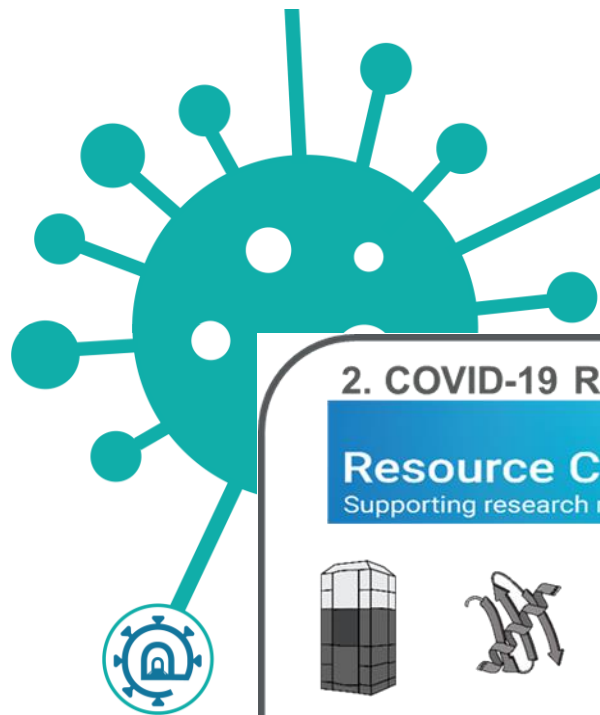


Biomedical Research Infrastructures

Instruct-ERIC Response to COVID-19

Priority Access to Structural Biology Services by Remote Access

faster review of proposals relating to COVID-19



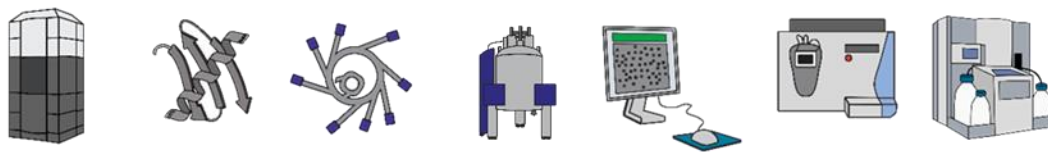
COVID-19 Resource Centre

Tools, information and support from Instruct and the wider scientific community.
instruct-eric.eu/covid19

2. COVID-19 Resource Centre

Resource Centre

Supporting research relating to SARS-CoV-2 and COVID-19



Access to community resources and literature
Flash reports on research progress
Special features on Instruct services and remote access

Priority Access in Action

A team led by Prof Antson at YSBL have been working with the Astbury Centre to determine the 3D structure of SARS-CoV-2 nucleocapsid protein.



COVID-19 Mass Spectrometry Coalition

An international initiative from the BMBS to use mass spectrometry in the global research action against SARS-CoV-2, by sharing data and sample collection and processing protocols.



SERVICES

COVID-19 preclinical drug development database

The Academy of Medical Sciences has launched a database to map emerging COVID-19 preclinical drug development research across the UK to help boost collaborations.



COLLABORATION

Free license to use Galactic Web App

Biorelate are providing open access to their lead product Galactic - a browser-ready, deep search tool to help derive biomedical insights. Anyone can register for a minimum of 3 months access for free.



LITERATURE

Covid19-NMR

An international project using NMR to determine RNA and protein structures of SARS-CoV-2, and to investigate the druggability of those structures by small molecules. The resulting data will be made publicly available.



DATA



Rapid access to structural biology services

INEXT-Discovery offers facility access and support to all European scientists for translational research in structural biology. Applications addressing COVID-19 will be funnelled towards rapid review.



SERVICES

Biomedical Research Infrastructures

Instruct-ERIC Response to COVID-19



Delivering important research outcomes & new technology

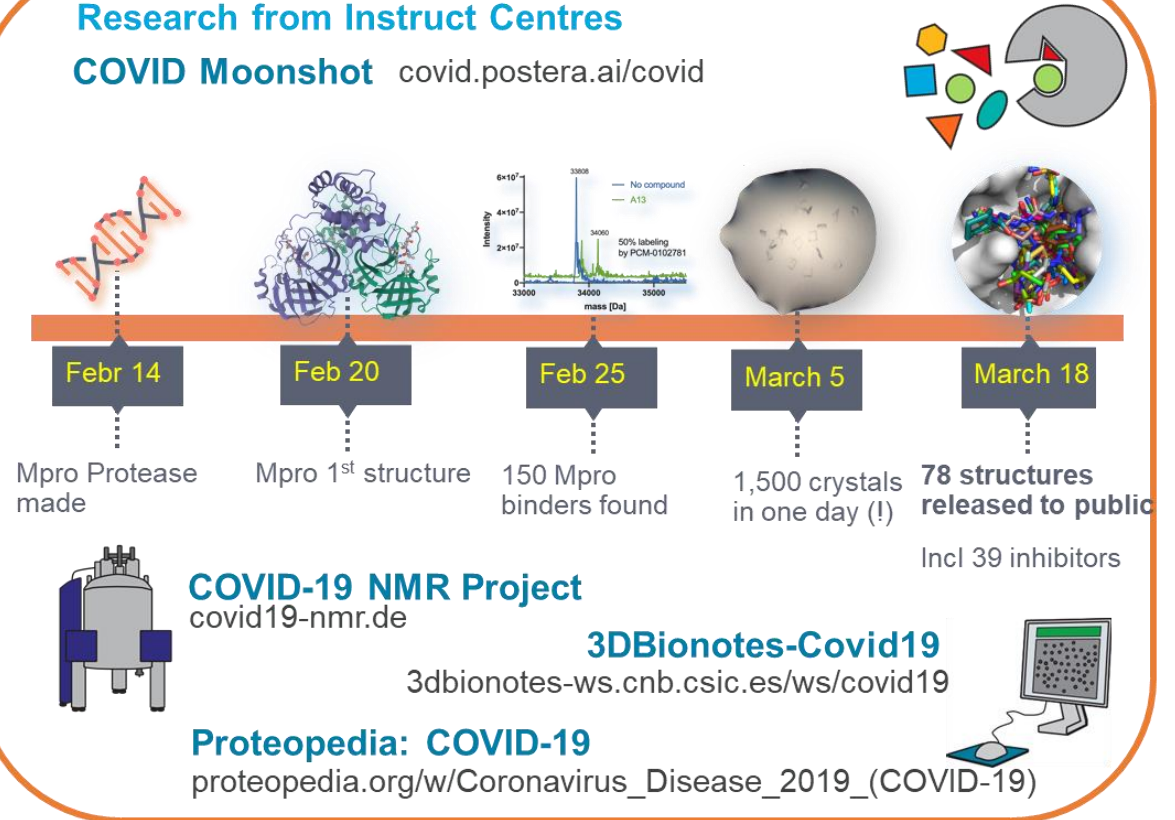
UK Protein Portal

Instruct partner in GLOBAL Crowd-Sourcing for COVID drug designs



Research from Instruct Centres

COVID Moonshot covid.postera.ai/covid



4. UK Protein Portal

COVID-19 Protein Portal to provide essential reagents for national SARS-CoV-2 research



COVID-19 Protein Portal



Biomedical Research Infrastructures

ELIXIR support to COVID-19 research

ELIXIR provides a range of services that you can use for studying the SARS-CoV-2 coronavirus and the COVID-19 disease.

- Find a database to store your data
- Access data relevant to COVID-19
- Make your data easier to find and share
- Find software and workflows to analyse your data
- Find computing resources to help you analyse datasets
- Contribute to ELIXIR's work on COVID-19
- Find COVID-19 publications from ELIXIR
- Services offered by other European infrastructures
- Find out more
- Related news

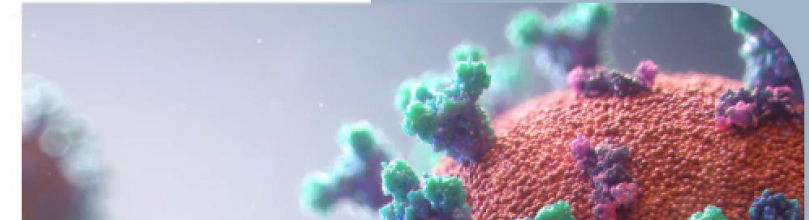


Use our [interactive map](#) to find out what each country in ELIXIR is doing in response to COVID-19.



INFRAFRONTIER supporting COVID-19 research

- <https://www.infracontier.eu/knowledgebase/therapeutic-area/covid-19-resources-and-measures>
- COVID-related resources and services from 10 INFRAFRONTIER partners
- List of available mouse strains for COVID research from the INFRAFRONTIER EMMA Archive
- Emergency archiving of valuable mouse strains for institutions struck by the shutdown



 **GMMCC**

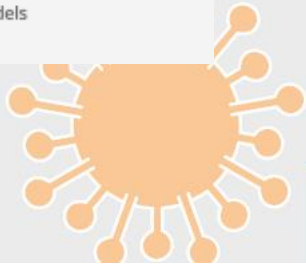
[Our Aims](#) [Resources](#) [Members](#) [Organisations](#) [Why Mouse](#)

WE ARE THE GMMCC

THE GLOBAL MOUSE MODELS FOR COVID-19 CONSORTIUM

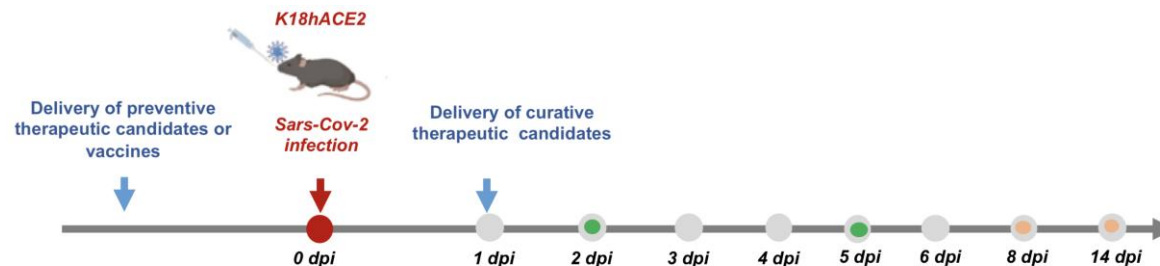
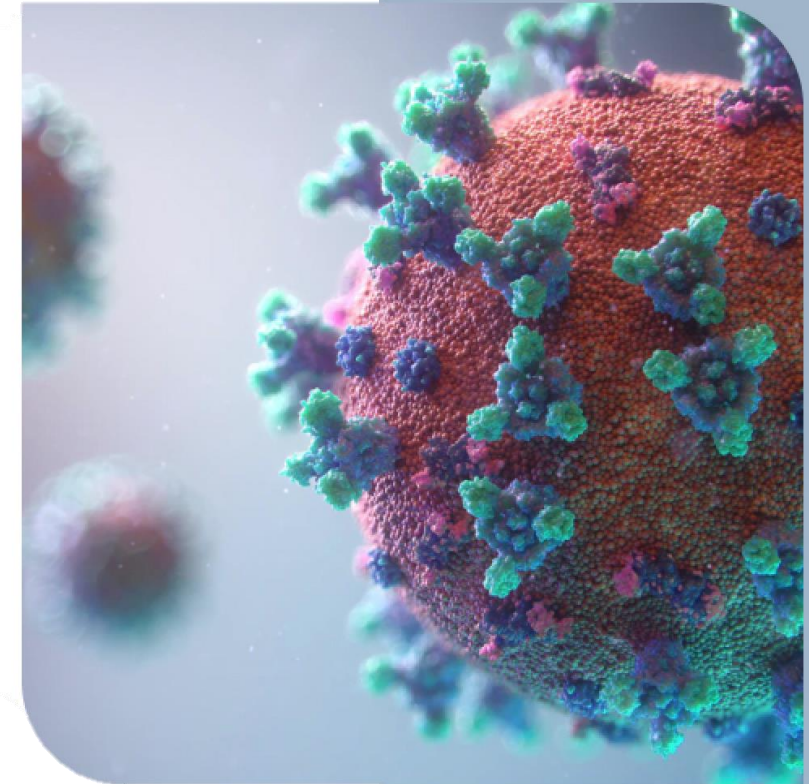
A Global Partnership of Mouse Genetics, Genomics, and Functional Assessment Centres

[View COVID Resources](#)



INFRAFRONTIER supporting COVID-19 research

- **Trans-national Access Call: COVID-19 Therapeutics Pipeline**
- Assessing novel potential vaccine and treatment compounds for COVID-19
- Call was opened for 6 weeks in Jan/Feb 2021
- 4 times more applications than access slots





Do Covid19 reserch and provides service:

- Provides preclinal testin service
- Covid-19 mouse models (AAV-hACE2)
- BSL3 facility
- Availability of virus isolates

Article

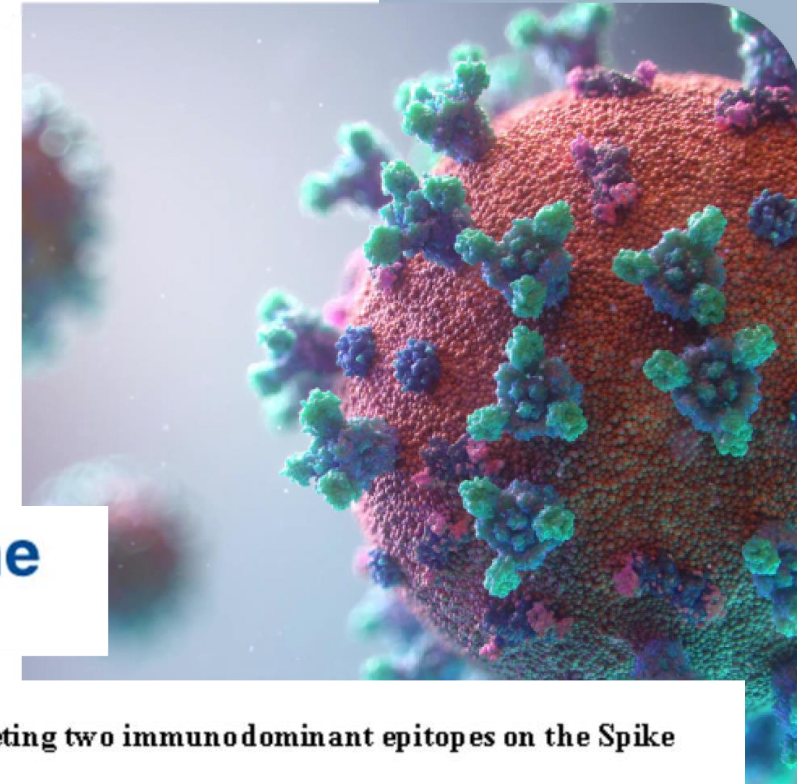
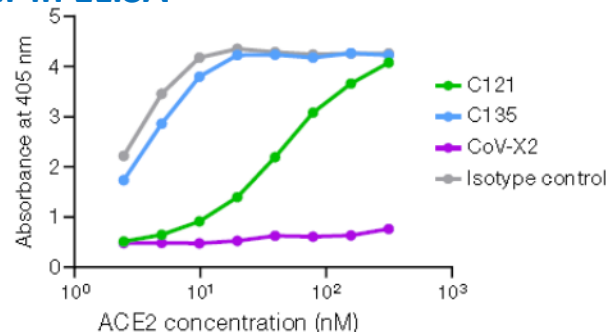
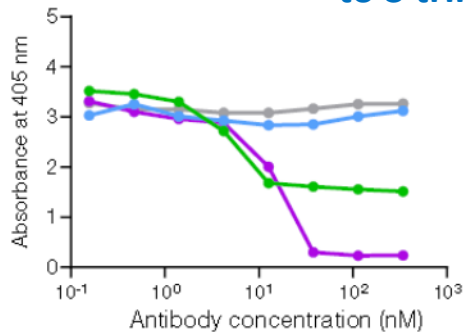
Bispecific IgG neutralizes SARS-CoV-2 variants and prevents escape in mice

<https://doi.org/10.1038/s41586-021-03461-y>
Received: 7 January 2021
Accepted: 16 March 2021

Raoul De Gasparo^{1,5}, Mattia Pedotti^{1,5}, Luca Simonelli¹, Petr Nickl², Frauke Muecksch³, Irene Cassaniti⁴, Elena Percivalle⁴, Julio C. C. Lorenzi⁵, Federica Mazzola¹, Davide Magri⁶, Tereza Michalcikova², Jan Haviernik⁷, Vaclav Honig^{7,8}, Blanka Mrazkova², Natalie Polakova², Andrea Fortova⁷, Jolana Tureckova², Veronika Iatsiuk², Salvatore Di Girolamo¹, Martin Palus^{7,9}, Dagmar Zudova², Petr Bednar^{7,9}, Ivana Bukova², Filippo Bianchini¹, Dora Mehn⁶, Radim Nencka¹⁰, Petra Strakova⁷, Oto Pavlis¹¹, Jan Rozman², Sabrina Gioria⁶, José Camilla Sammartino⁴, Federica Giardina⁴, Stefano Gaiarsa⁴, Qiang Pan-Hammarström¹², Christopher O. Barnes¹³, Pamela J. Bjorkman¹³, Luigi Calzolari⁶, Antonio Piralla⁴, Fausto Baldanti⁴, Michel C. Nussenzweig^{6,14}, Paul D. Bieniasz^{2,14}, Theodora Hatzioannou², Jan Prochazka², Radislav Sedlacek², Davide F. Robbiani^{1,15}, Daniel Ruzek^{7,8,16} & Luca Varani^{1,16}



CoV-X2 fully prevents ACE2 binding to S trimer in ELISA



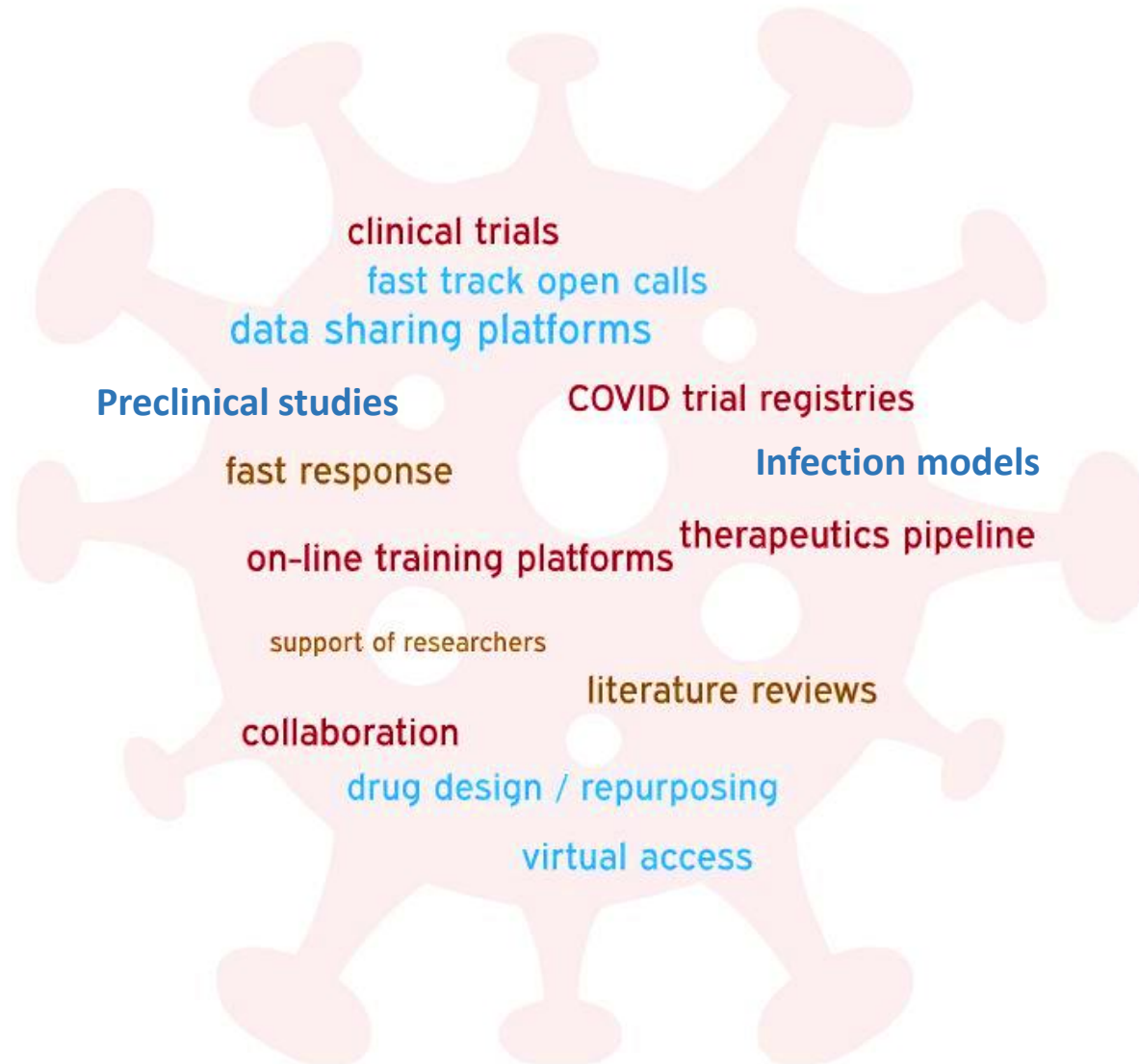
EBioMedicine
Published by THE LANCET

Monoclonal antibodies targeting two immunodominant epitopes on the Spike protein neutralize emerging SARS-CoV-2 variants of concern

Bratislav Kovacech^{1,2*}, Lubica Fialova², Peter Filipcik^{2,3}, Rostislav Skrabana², Monika Zilkova², Natalia

Biomedical Research Infrastructures

Wide Range of Health & Food ESFRIs Activities in Response to COVID-19 Pandemic





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Thank you

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Radislav Sedlacek