

Factsheet



FULL TITLE The pandemic within: tackling brain vulnerability in COVID19 at high resolution: NEUROCOV

PROGRAMME Horizon Europe / HORIZON-HLTH-2021-DISEASE-04-07

CONTRACT NUMBER 101057775

ABSTRACT The COVID19 pandemic has shown our health care fragility vis a vis novel pathogens, with a global disruption on societal welfare. Despite the towering success of vaccine development, lack of preparedness on integrative clinical and molecular phenotyping has emerged with clarity and highlights the need to scale translational efforts for personalized prevention and therapy. Of particular concern are the long-term consequences of SARS-CoV-2 infection with high and rising prevalence of chronic manifestations referred to as Post-COVID. Among these the neurological and psychiatric complications stand out for frequency, lack of treatment and devastating impact of their effects at pandemic scale. Here, we tackle the cognitive and neurodegenerative complications of COVID-19, referred to as NeuroCOVID, as a ticking pandemic within the pandemic that requires an innovation leap across disciplines. We pursue a multi scalar approach that reaches from epidemiology and mechanistic interrogation of host/virus interplay at single cell resolution through predictive modelling all the way to validation of biomarkers and repurposed drugs. The aim is to anticipate and effectively manage personalized trajectories of NeuroCOVID vulnerability and their impact at population level. For this we leverage two leading national health registries and three clinical cohorts to characterize the phenotypic spectrum of NeuroCOVID, its risk factors and its socioeconomic burden at high definition. We pioneer innovative robotics to scale brain organoid modelling and combine it with single cell multiOMICs and AI analytics to dissect the principles of the individual host response and render experimentally actionable the authentic genetic backgrounds of differential SARSCoV-2 sensitivity. Through a substantive engagement of patients' collectives and health care stakeholders, upstream integration of innovative pipelines streamlines translation and operationalizes precision medicine for emerging medical needs.

DURATION 60 months (01/09/2022 - 30/08/2027)

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COORDINATOR Joachim Schultze
Deutsches Zentrum für Neurodegenerative Erkrankungen e.V.
Email Prof Schultze: Joachim.Schultze@dzne.de

PARTNERS Belgium

- Katholieke Universiteit Leuven

Germany

- Deutsches Zentrum für Neurodegenerative Erkrankungen e.V.
- Helmholtz Zentrum München Deutsches Forschungszentrum für Gesundheit und Umwelt GmbH
- Eurice - European Research and Project Office GmbH

Finland

- Helsingin Yliopisto

Israel

- Ben-Gurion University of the Negev

Italy

- Fondazione Human Technopole
- Università degli studi di Milano

Netherlands

- Stichting VUmc

Sweden

- UMEA Universitet

CONTACTS AT EURICE Laura Schweigert
Project Manager
Alt-Reinickendorf 25
13407 Berlin, Germany
Phone: +49 30 374 415 846
Email: l.schweigert@eurice.eu

WEBSITE www.neurocov.eu