Press Release

environMENTAL – NEW EU-FUNDED PROJECT REVEALS THE ROLE OF ENVIRONMENTAL FACTORS FOR MENTAL ILLNESSES

European research consortium environMENTAL to uncover mechanisms underlying mental illnesses triggered by climate change, urbanisation and COVID-19 pandemic induced psychosocial stress

Volterra, Italy, the 7th September 2022: The EU-funded project environMENTAL is holding its kick-off meeting to initiate its investigation on the influence of global environmental challenges on brain and mental health. The international consortium led by Prof. Gunter Schumann, Head of the Centre for Population Neuroscience and Stratified Medicine (PONS) at Charité's (CCM) Department of Psychiatry and Psychotherapy and at ISTBI, Fudan University Shanghai, will study the impact of climate, pollution, urbanicity, regional socioeconomic conditions, as well as the Covid19 pandemic on brain health, and characterize its underlying biological mechanisms. The researchers will analyse data from more than one million European citizens and patients to uncover brain mechanisms linked to environmental adversity and leading to symptoms of depression, anxiety, stress and substance abuse.

Project Coordinator Prof. Dr. Gunter Schumann, "A better understanding of the environmental factors and their genetic moderation responsible for specific disease mechanisms will help to estimate individual risk levels and facilitate the treatment of environmentally related mental illnesses".

Data acquired through remote-sensing satellites, climate models, measures of the atmosphere, public resources as well as digital health applications will be related to citizen- and patient data using complex computer models based on artificial intelligence to demonstrate the impact of environmental challenges on brain structure and function. Comprehensive -omics analyses, 3D brain organoids and virtual brain simulations will complement the analyses to identify underlying molecular mechanisms.

Having identified the relevant molecular pathways, the environMENTAL researchers will start to screen pharmacological compounds to identify molecules that interact with disease-causing molecules, thus boosting drug discovery. **Ksilink**, a French-German, public private partnership dedicated to foster patient-based drug discovery efforts, will take the lead in initiating the translation of the identified molecular underpinnings of environmental factors involved in major mental disorders into potential therapeutic benefits for patients. "Deciphering the intricate interplay of gene-environment interactions causally involved in mental disorders will open new avenues for the development of disease-modifying therapeutic interventions" predicts Peter Sommer, Scientific Director of Ksilink.

In parallel, pioneering digital health solutions using virtual reality (VR) will be established to enhance adaptive coping in people at risk for environment-related mental illness. Participants will be exposed to different environmental-psychosocial scenarios like crowdedness or noise and trained to cope with these environmental challenges. In addition, participants will have access to a virtual therapist, guiding them to overcome anxieties and depression. This will be linked to the digital health assessments, developing a set of neuropsychological testings together with a smartphone app for daily life mapping of health-related issues in combination with environmental factors. This will be based on the principles of citizen science allowing for stronger participation of and interaction within the community.

For all activities, the consortium attaches high value to an early and broad stakeholder engagement and complies with the highest ethical and safety standards.
With its highly innovative and interdisciplinary approach, the project brings together the ideas and expertise of neuroscientists, psychiatrists, geo-scientists, climatologists, psychologists, epidemiologists, anthropologists, computer scientists, experts in digital interventions as well as non-academic stakeholders such as patient associations.

environMENTAL lasts until May 2027 and is supported by the European Union with € 9 million. It has received this funding from the European Union's Horizon Europe research and innovation action under grant agreement GA 101057429.

environMENTAL consortium members

The research consortium unites internationally leading researchers from Charité Berlin, Freie Universitaet Berlin, Zentralinstitut fuer Seelische Gesundheit, Universitaetsklinikum Schleswig-Holstein, Universitetet i Oslo, Universitaet Potsdam, Radboud University Medical Centre, Institute of Science and Technology Austria, Universitat de Barcelona, Univesitaetsklinikum Bonn, Université d'Aix Marseille and Friedrich-Schiller-Universiteit Jena with innovative European SMEs Life and Brain GmbH, KSILINK, Virtual Bodyworks SL and ARTTIC Innovation GmbH, supported by the global experts at Fudan University, Georgia State University Research Foundation, University of Southern California, King's College London, De Montfort University and Google LLC.

For further information

www.environmental-project.org

Twitter: environMENTAL_project
LinkedIN: environMENTAL EU Project

Project Contact:

EnvironMental.charite@outlook.com

Press Contact:

press@arttic-innovation.de

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