HORIZON-HLTH-2024-DISEASE-08-20

Pandemic preparedness and response: Host-pathogen interactions of infectious diseases with epidemic potential

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European Commission

Destination 3: Tackling diseases and reducing disease burden

Communicable and non-communicable diseases cause the greatest amounts of premature death and disability in the EU and worldwide.

Destination 3 → addressing an urgent need for research and innovation to develop new prevention measures, public health interventions, diagnostics, vaccines, therapies, antimicrobials and their alternatives, as well as to improve existing prevention strategies to create tangible impacts, taking into account sex/gender-related issues.

- Key Strategic Orientation: 'Creating a more resilient, inclusive and democratic European society'

- Impact areas:
  - Good health and high-quality accessible health care
  - A resilient EU prepared for emerging threats
  - Climate change mitigation and adaptation
  - High quality digital services for all

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Destination 3: Expected impacts

- **Health burden of diseases in the EU and worldwide is reduced** through effective disease management, including through the development and integration of innovative diagnostic and therapeutic approaches, personalised medicine approaches, digital and other people-centred solutions for health care.
- **Premature mortality from NCDs is reduced** by one third (by 2030), **mental health and well-being is promoted**, and the voluntary targets of **the WHO Global Action Plan for the Prevention and Control of NCDs 2013-2020 are attained (by 2025)**, with an immediate impact on the related disease burden (DALYs).
- Health care systems benefit from **strengthened research and innovation expertise, human capacities and know-how for combatting communicable and non-communicable diseases**, including through international cooperation.
- Citizens benefit from **reduced (cross-border) health threat of epidemics and AMR pathogens, in the EU and worldwide**. In particular, the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases are contained and hepatitis, water-borne diseases and other communicable diseases are being combated.
- Patients and citizens are **knowledgeable of disease threats, involved and empowered to make and shape decisions for their health, and better adhere to knowledge-based disease management strategies and policies** (especially for controlling outbreaks and emergencies).

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Call & deadlines

- TOPIC ID: HORIZON-HLTH-2024-DISEASE-08-20
- Type Action : Research and Innovation Actions (RIA)
- Deadline model: Single-stage
- Opening date : 26 October 2023
- Deadline dates : 11 April 2024 (17h00 CET)
- **EU** Budget: EUR 50 million (EUR 7 and 8 million per project)
- India/DBT Budget: According to the requirement of the project (**INR**)

European Commission

Expected Outcome

We have identified three primary expected outcomes for this topic:

1) **Enhanced Knowledge**: Researchers and healthcare professionals will gain deeper insights into viruses with epidemic potential. Specifically, we aim to improve our understanding of pathogen-host interactions, a crucial element for developing targeted vaccines and inhibitors to prevent viral infections and transmission.

2) **Innovative Approaches**: We strive to provide the scientific and clinical communities with novel approaches for the prevention and treatment of emerging and re-emerging infections, especially in the context of epidemic and pandemic preparedness.

3) **Development Pipeline**: Our objective is to establish a diverse and robust development pipeline for vaccine candidates and inhibitors, offering increased therapeutic options for clinical deployment during epidemics or pandemics.

Scope (1/2)

Ongoing Threat of Infectious Diseases:

- The COVID-19 pandemic has underscored the persistent and significant threat posed by infectious diseases, both within the European Union (EU) and on a global scale.

Acceleration of Viral Disease Emergence:

- Factors such as climate change are expected to accelerate the emergence of viral diseases, making it imperative to take proactive steps.

Proactive Approach:

- To address this challenge, a proactive approach is necessary, specifically focusing on the development of vaccines and inhibitors targeting the cellular uptake of viruses.

Critical Preparedness Measure:

- The availability of vaccines and inhibitors targeting viral cellular uptake is a critical preparedness measure against future health threats, particularly those pathogens meeting Health Emergency Preparedness and Response Authority (HERA) criteria.
  https://health.ec.europa.eu/system/files/2022-07/hera_factsheet_health-threat_mcm.pdf

Scope (2/2)

Innovative Approaches:

- Proposals should adopt innovative approaches to characterize host-pathogen interactions, aiming to inhibit viral replication, proteases, exit strategies, and develop therapeutic antibodies and vaccines.

Focus Viruses:

- Proposals should primarily focus on a specific set of viruses with high epidemic or pandemic potential. These include Hendra and Nipah virus, Lassa virus, Crimean Congo haemorrhagic fever virus, Rift Valley fever virus, Ebola and Marburg virus, Dengue virus, Yellow Fever virus, Zika virus, West Nile fever virus, and Chikungunya virus.

Consideration of Sex and Gender Aspects:

- Proposals should take into account sex and gender aspects in their research and development efforts.

Global Therapeutic Research and EU Leadership:

- The goal is to diversify and expedite the global therapeutic research and development pipeline for emerging and re-emerging viral infections. This will strengthen the EU's prominent role in therapeutic research and development.

Research Areas

Identification of Host Cell Receptors:

- Proposals should focus on the identification and characterization of receptors on host cells that enable the docking and internalization of viruses. Emphasis should be placed on understanding the diversity of cellular entry receptors and tissue specificity.

Characterization of Viral Surface Proteins:

- Research efforts should include the identification and characterization of viral surface proteins capable of interacting with host target cells.

Mechanism of Viral Uptake:

- Proposals should investigate the mechanism of viral uptake within host cells, with a focus on understanding the topology and dynamics of the interaction between host receptors and viral ligands.

Identification of Targetable Receptor and Ligand Subunits:

- Research should aim to identify receptor and ligand subunits that could be targeted for preventive or therapeutic intervention.

Collaboration with JRC and Clinical Studies

Collaboration with JRC:

- Proposals are encouraged to consider the inclusion of the European Commission's Joint Research Centre (JRC) research infrastructure, particularly the Nanobiotechnology laboratory. This facility offers expertise in the biophysical characterization of recombinant proteins, antigens, and therapeutic antibodies. JRC's capabilities at the interface between research activities and regulatory aspects can greatly benefit research projects.

Collaboration Process:

- Collaboration with JRC should be established after the proposal's approval, based on relevance and mutual interest. JRC is open to collaborating with successful proposals to enhance the impact of research.

Clinical Studies Consideration:

- Applicants intending to include clinical studies in their proposals should provide *detailed information* using the template provided in the submission system. The definition of clinical studies can be found in the introduction to this work program part.

Clinical Studies

- **Definition of clinical studies can be found in the introduction of this work programme**:

  - Clinical studies/trials/investigations are defined as **any systematic prospective or retrospective** collection and analysis of health data obtained from **individual patients or healthy persons** in order to address **scientific questions** related to the **understanding**, **prevention**, **diagnosis**, **monitoring** or **treatment of a disease, mental illness, or physical condition.**

  - They include but it not limited to clinical studies **as defined by Regulation 536/2014** (**on medicinal products**), clinical investigation and clinical evaluation as defined by **Regulation 2017/745** (on **medical devices**), performance study and performance evaluation as defined by **Regulation 2017/746** (on in vitro diagnostic medical devices).

See: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-4-health_horizon-2023-2024_en.pdf (page 10-11)

International Cooperation

- Pool expertise, know-how, and research infrastructures worldwide.
- Align with other funders to leverage investments for priority needs.
- Collaborate with international organizations to address global health challenges, combat infectious diseases, and strengthen patient safety.

Conclusion

- **Research Importance**: Emphasize the critical role of research in addressing infectious disease threats, especially epidemics.
- **Proactive Approach**: Stress the need for a proactive response to evolving health challenges, including climate-induced disease emergence.
- **Objectives Summary**: Outline research objectives: identifying host cell receptors, viral proteins, and uptake mechanisms.
- **Targeted Interventions**: Highlight the significance of targeting receptor and ligand subunits for prevention and treatment.
- **Collaboration Potential**: Mention collaboration opportunities with JRC for enhanced research.
- **Clinical Studies**: Stress the importance of detailed clinical study information in proposals.