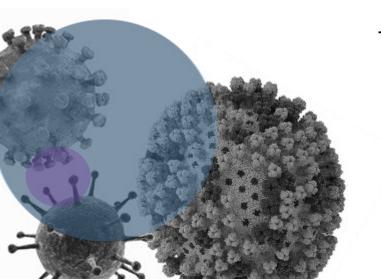




REACT: RESPIRATORY HOST-PATHOGEN INTERACTION

Horizon Europe Framework Programme
Horizon-RIA (Research and Innovation Actions)
Tackling diseases (Horizon-Hlth-2021-Disease-04-07)



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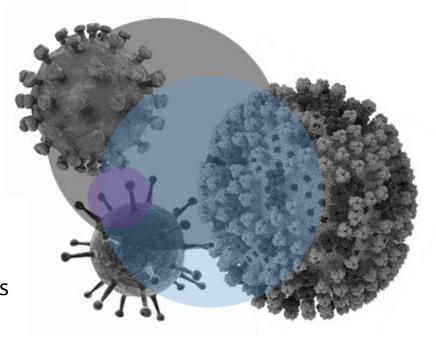




CONTRIBUTING TO PATIENT CARE IN EMERGING INFECTIOUS DISEASES

Lower respiratory tract infections resulting from seasonal epidemics and pandemics are among the **leading causes of death globally.**

The predominant viral etiological agents of lower respiratory tract infections include influenza viruses, paramyxoviruses and coronaviruses.



Regarding health assistance, there is a paucity of treatment options for viral respiratory pathogens, and patient care remains largely supportive.

This underscores a desperate need for identifying novel targets for prophylactic/treatment interventions and early prediction models of disease outcome to personalise treatments.



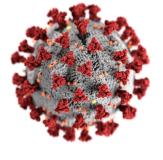


REACT: RESPIRATORY HOST-PATHOGEN INTERACTION

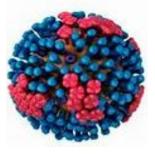
August 2022 – July 2026

PROJECT OBJECTIVES AND MILESTONES

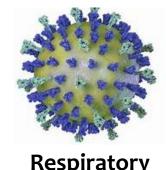
REACT aims to define and to deepen within the **lower tract viral respiratory diseases**, which are the **mechanisms and variables** (genetic, immunophenotypic, demographic and clinical) that affect in the context of the disease course, through the analysis of the **host-pathogen interaction and characteristics**, as well as the **immunological characterisation of emerging viral variants**, focusing on the predominant viruses (SARS-Cov-2, influenza and respiratory syncytial virus (RSV)).



SARS-Cov-2



Influenza



Respiratory syncytial virus RSV







SCOPE

CHARACTERIZATION OF THE HOST RESPONSE AND HOST-PATHOGEN INTERACTION

Genetic patterns
Physiological mechanisms
Molecular pathways



Influenza (AH1N1 / H3N2)

RSV (A & B)

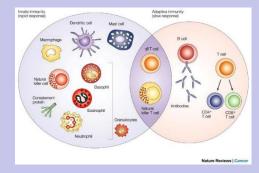
Sars-Cov-2

Factors that predispose to different clinical symptoms and progression of the viral disease, leading to different clinical outcomes.

DEEP IMMUNOLOGICAL PHENOTYPING OF THE HOST RESPONSE

Dynamics of the innate and adaptive immune responses to the chosen virus(es)

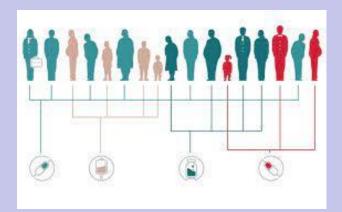
Association of HLA assets of patients with protective or harmful immune responses.



Inform disease progression and the development of personalised prophylactic and therapeutic strategies.

CREATION OF DIVERSE COHORTS

Analysis on the effect of differences in age, sex, gender, ethnicity, chronic conditions, co-morbidities, treatments offered

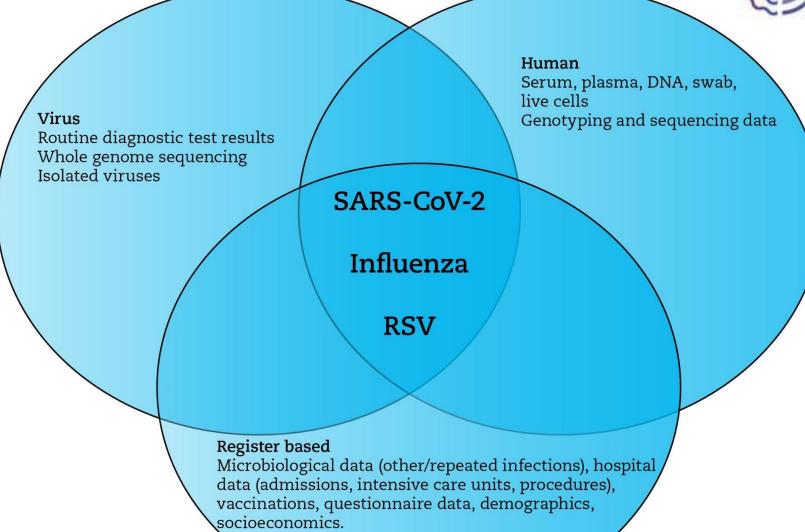


Guidance on definition for personalised patient management and early identification of patients at risk



@ REACT

DATA





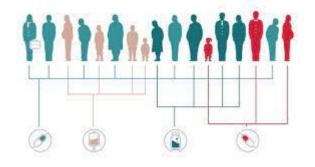


REACT: RESPIRATORY HOST-PATHOGEN INTERACTION

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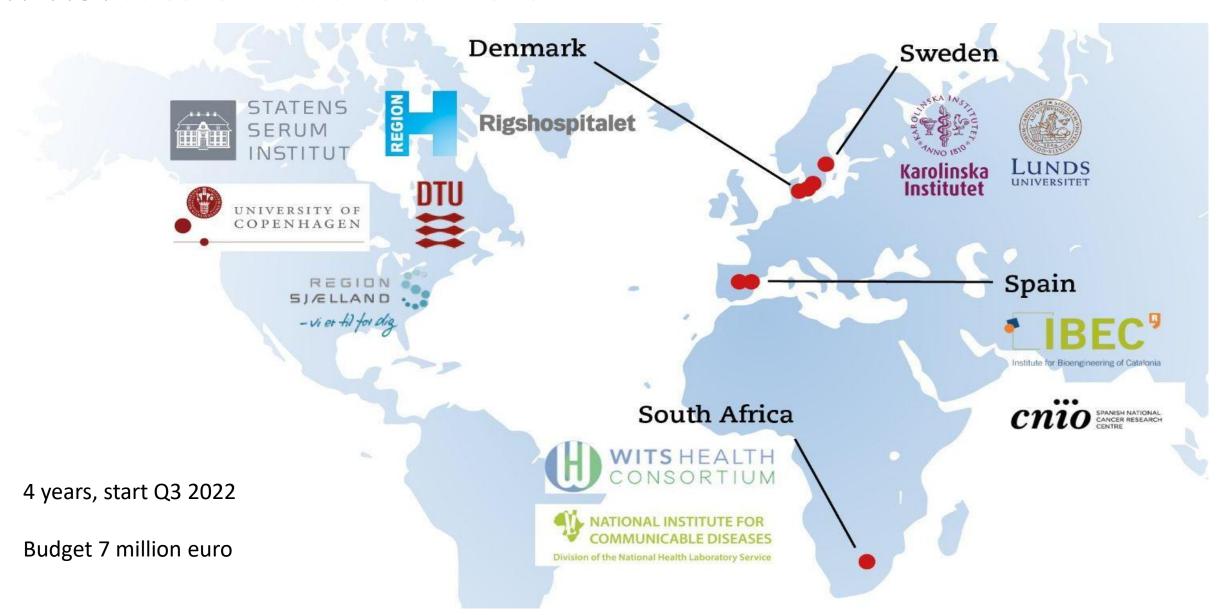
PROJECT OBJECTIVES AND MILESTONES

REACT will provide a better understanding of the complex molecular interaction between pathogenic respiratory viral infections and the human host, to aid **personalised treatment, identification of therapeutic targets and define vaccination efforts.**





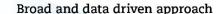
REACT PROJECT PARTNERS AND BUDGET



WORK PACKAGES

WP1 Project management Meetings, budgetting, reporting





WP2 Integration of existing sample collections and collaboration with existing biobanks.
Collection of live cells from individuals with respiratory viral infections.
Collaboration with other



initiatives.

Respiratory viral infections SARS-CoV-2, influenza, RSV Diagnostic testing and viral whole genome sequencing. Live virus isolation.

WP4 Host-pathogen genetic interaction. Broad host genotyping and deep sequencing vs. viral WGS Register based approach with data on microbiology, hospitalisation, vaccinations, prescription drugs, demographic data.

Deep cellular analysis

Clinical validation and patient impact

WP5 In-depth T-cell analysis Epitope landscape HLA reportoire Effector mechanisms

WP6 In-depth B-cell analysis B-cell receptor sequence Isotype swithcing Antibody quality

WP7 Innate responseViral control and disease severity.

WP8 Organoid models
Validation of novel targets and
biomarkers.

WP9 Clinical validation

Novel prognostic biomarkers through algorithms to specific treatments and personalised medicine.

Preventive measures and disease preparedness.



Identify risk factors for severe disease



Therapeutic

monoclonal antibody

candidates

Identify novel therapeutic targets



WP10 Dissemination, exploitation and communication

Scientific papers, guidelines, public engagement, website, social media

WP11 Ethics requirements

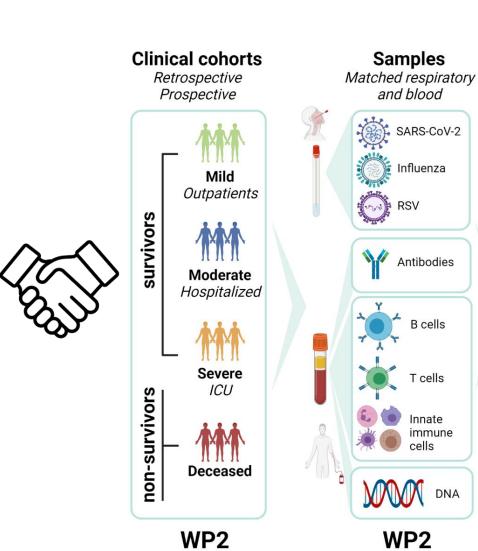
Establishment of external Ethics Board. Periodic reporting on etical considerations





REACT PROJECT COLLABORATIONS





Investigations Whole genome sequencing Virus and host

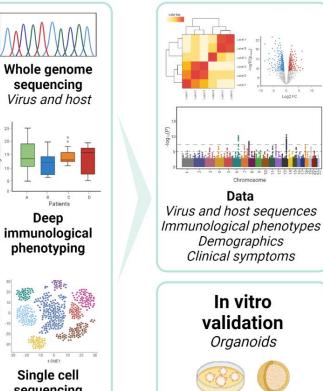
Deep

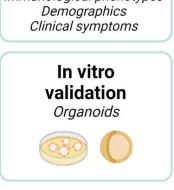
phenotyping

Single cell

sequencing

WP3-7

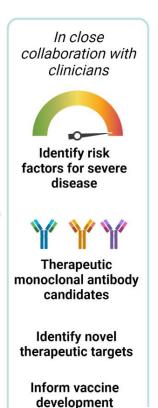




Integrative

analyses

Patient management



WP9



WP8





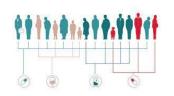
EXPECTED OUTCOMES

- Characterization of host response at the level of genetic patterns, molecular pathways and
 physiological mechanisms, informing disease predisposition, disease progression, symptoms
 expression and clinical outcomes.
- Deep characterization of the **dynamics of the immune responses** to the chosen virus(es), **identifying factors critical for viral control and immune protection.**
- Provide a robust and common evidence base and biomarkers definition for the development of personalised therapeutic interventions and vaccines in the future.
- Guidance on preventive measures and early identification of patients at risk of developing severe symptoms for better patient management.





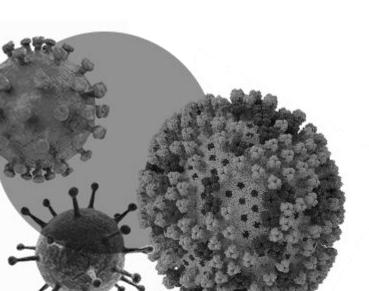








THANK YOU



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