



European Research Council  
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# ERC frontier research contribution to EU4Health

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The European Research Council (ERC) follows a strictly bottom-up approach to funding research proposals, with excellence as the sole criterion for selection. The research that ERC grantees pursue, free of any thematic objectives, generates results that address a wide range of issues with significant socioeconomic, environmental and policy relevance. As a result, this rich and diverse portfolio of frontier research generates new knowledge and proposes concrete solutions for addressing some of the most pressing policy priorities of the European Commission. This is the case for the over 2000 projects funded by the ERC, worth more than €4 billion, in the Horizon 2020 (H2020) Framework Programme (2014–2020) that are relevant for ‘EU4Health’.

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Data as of December 2021

# ERC frontier research contribution to EU4Health

This fact sheet provides an overview of the projects relevant for the selected areas of [EU4Health](#). The projects were funded under the Starting Grant (StG), Consolidator Grant (CoG), Advanced Grant (AdG) and Synergy Grant (SyG) schemes launched in the H2020 Framework Programme (2014–2020)\*



**2281 ERC-funded projects, worth €4613 million**

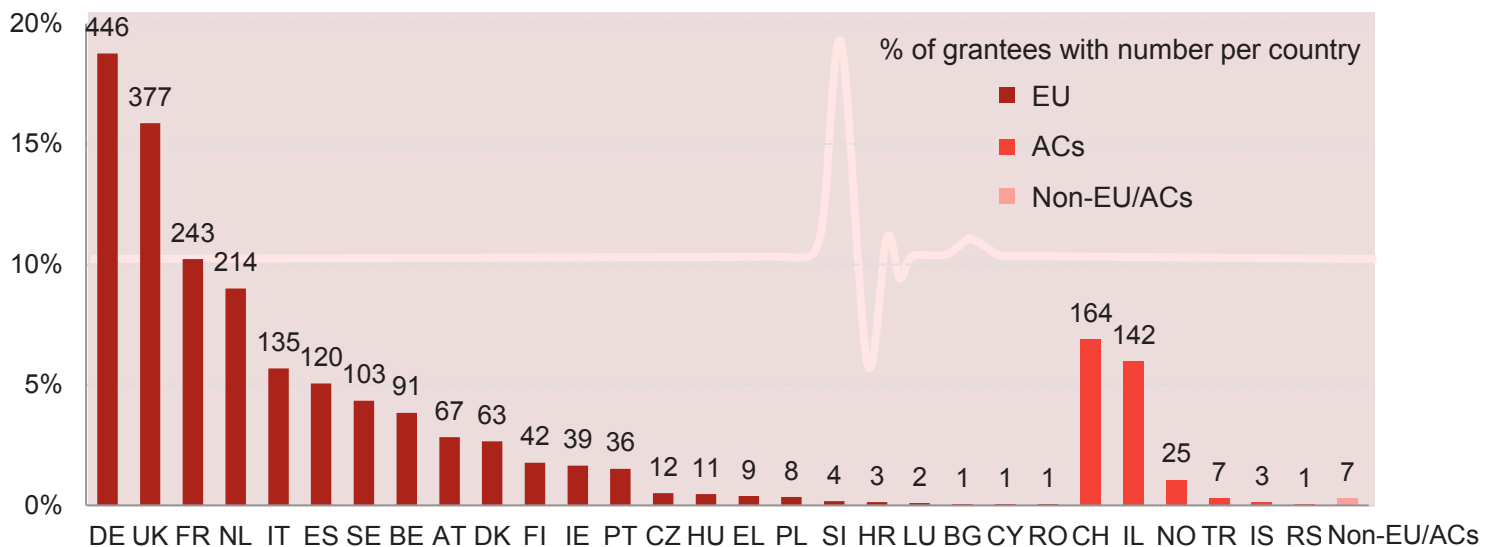
**Physical sciences and engineering**  
408 projects, €844M

**Life sciences**  
1482 projects, €3046M

**Social sciences and humanities**  
391 projects, €723M

## Distribution of ERC-funded projects in Horizon 2020

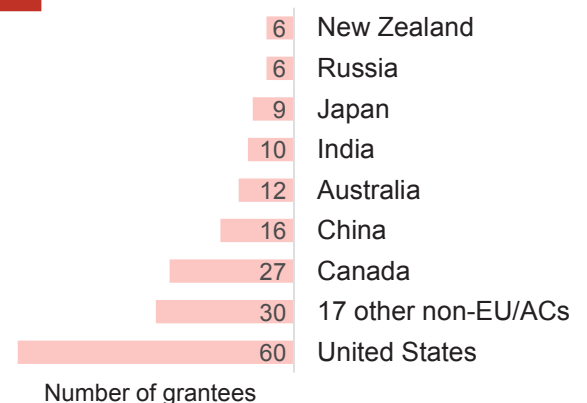
2377 grantees lead 2281 projects and are based in 23 EU Member States, 6 Associated Countries (ACs) and 3 non-EU/ACs



### Host institutions with ≥37 funded projects

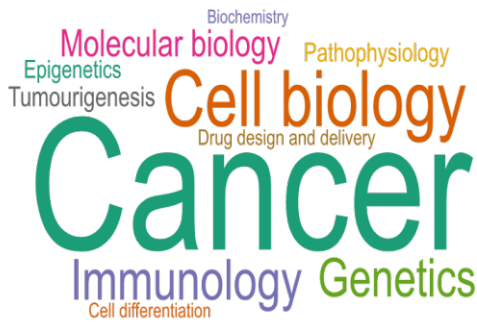


### Country of origin of grantees other than EU or ACs (≤4 grouped together)





# The scientific landscape of frontier research projects contributing to the selected EU4Health areas



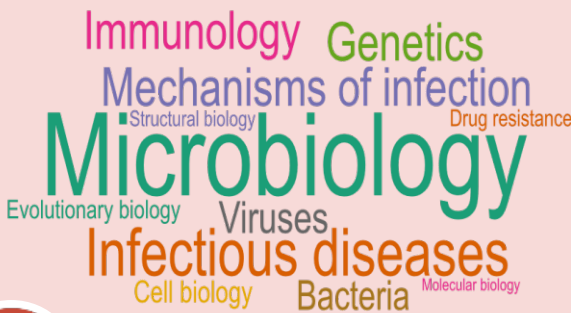
## Cancer

527 projects, €1082 million



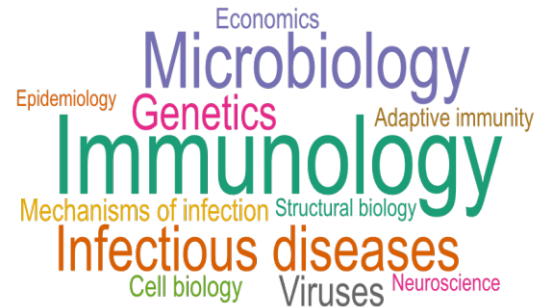
## Other non-communicable diseases

280 projects, €550 million



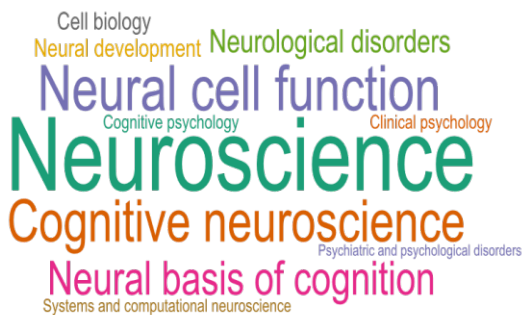
## Infectious diseases

222 projects, €438 million



## COVID-19

192 projects, €420 million



## Brain and human mind research

600 projects, €1232 million



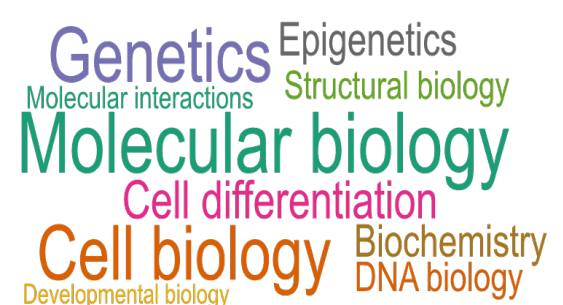
## Public health and healthcare

316 projects, €618 million



## Tools, therapies and digital health

678 projects, €1392 million



## Other health-related research

299 projects, €590 million

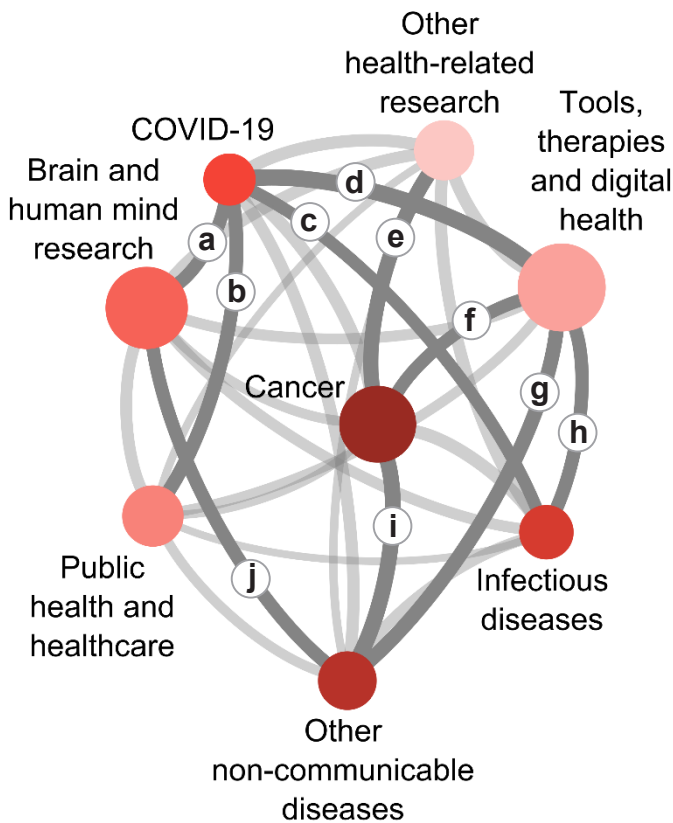


The word clouds represent the most prevalent scientific fields in the pool of ERC projects identified as relevant for each of the selected areas of EU4Health. The total number of projects under each area as well as the budget are indicated. 30% of the 2281 projects contribute to two or more of these areas.

# Scientific synergies and methodological developments in the selected EU4Health areas

## Scientific synergies among EU4Health areas

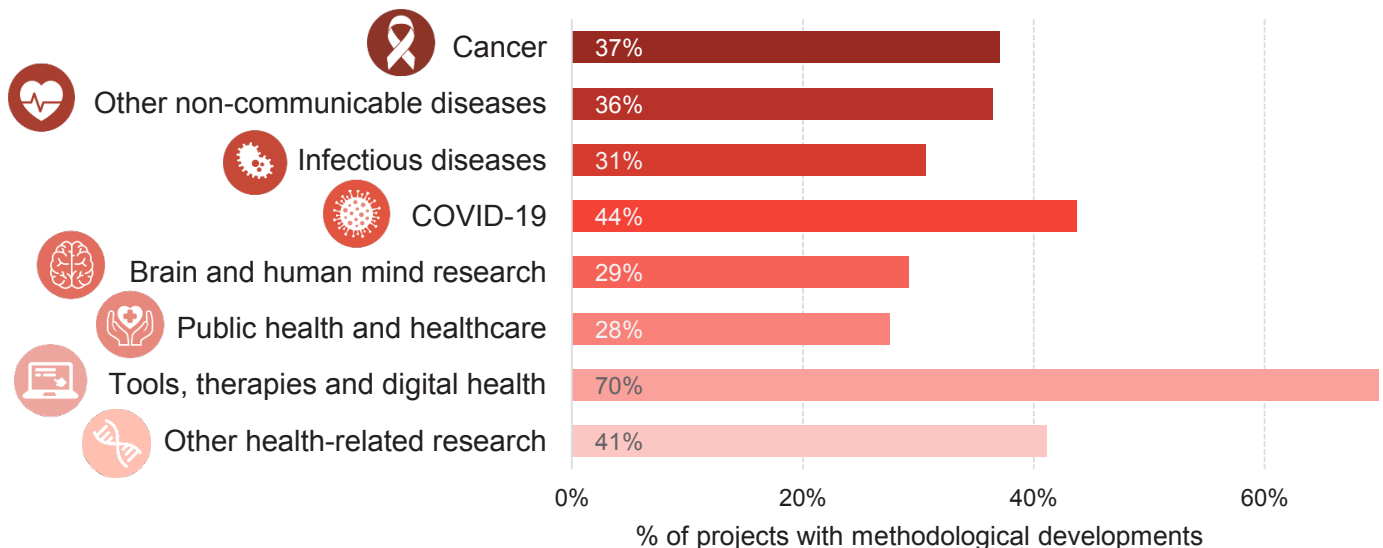
The nodes represent the selected areas of EU4Health and their size is proportional to the number of projects. These areas are interconnected and the strength of this connection is represented by the thickness of the arc, which is proportional to the number of shared scientific fields. The most representative scientific fields for the main connections, highlighted with letters, are listed.



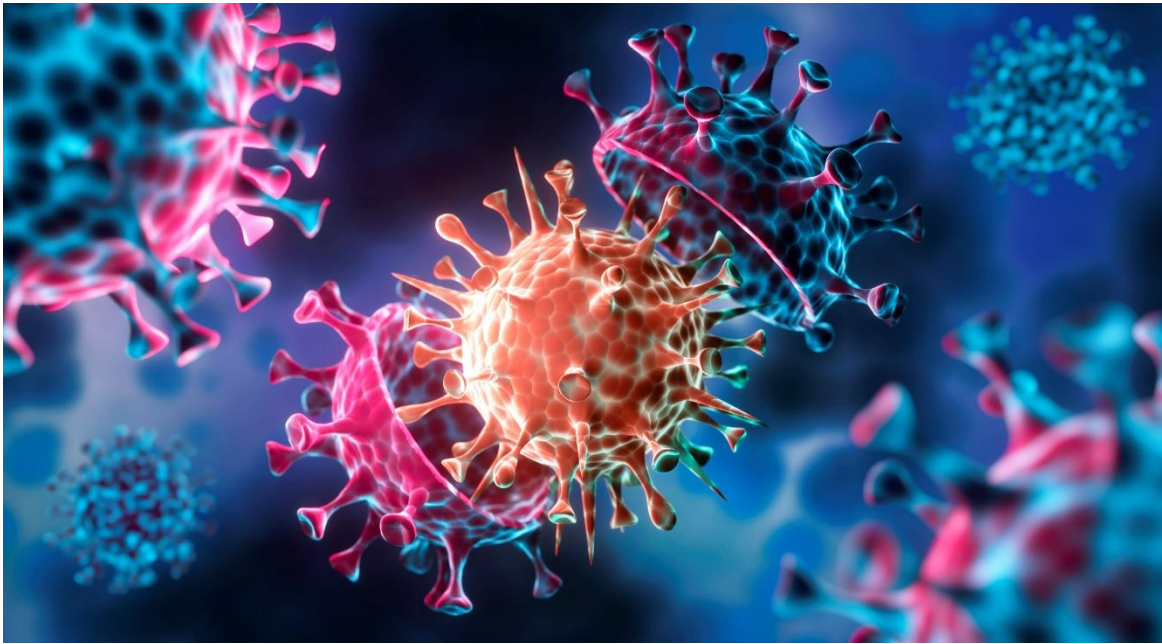
- Ⓐ Immunology; Genetics, Cell biology; Structural biology; Neuroscience
- Ⓑ Genetics; Immunology; Cell biology; Economics; Epidemiology; Neuroscience
- Ⓒ Immunology; Infectious diseases; Microbiology; Genetics; Cell biology; Structural biology; Epidemiology
- Ⓓ Immunology; Genetics; Cell biology; Microbiology; Infectious diseases; Structural biology
- Ⓔ Molecular biology; Cell biology; Genetics; Structural biology; Biochemistry; Immunology
- Ⓕ Cancer; Biomedical engineering; Diagnostics; Immunology; Pharmacology; Stem cells, regeneration
- Ⓖ Immunology; Cell biology; Genetics; Regenerative medicine; Biomedical engineering; Diagnostics; Molecular biology
- Ⓗ Immunology; Cell biology; Genetics; Molecular biology; Structural biology
- Ⓘ Immunology; Pathophysiology; Cell biology; Genetics; Biomedical engineering; Diagnostics; Molecular biology
- Ⓙ Cell biology; Genetics; Pathophysiology; Biomedical engineering; Diagnostics; Molecular biology

## Methodological developments in projects contributing to the selected EU4Health areas

The main methodological development in the projects relevant for the selected EU4Health areas is in the field of *Computational modelling, simulations* with in silico model and machine learning being the focus. Other prominent methodological developments are *Experimental methods* with a focus on imaging and microscopy and *Animal models* with a focus on humanized and engineered mouse models.



## Examples of projects contributing to the selected EU4Health areas



ERC grantee Irmela Jeremias' [LeukaemiaTargeted](#) project focusses on effective leukaemia treatment. Their [work](#) introduces molecular target validation as an important step for precision medicine.



At the University of Cyprus, [Triantafyllos Stylianopoulos](#) focusses on biomechanical aspects of tumour microenvironment to predict immunotherapy outcome. Their team developed a mathematical model for this [Immuno-Predictor](#) project that was also used to study COVID-19 disease progression.



Nuria Montserrat studies kidney diseases and in particular how to regenerate mammal's kidneys by [modelling genetic kidney disorders](#). The engineered mini-organs developed with the [REGMAMKID](#) project have served as model to study SARS-CoV-2 infection.



With [vAMRes](#), Rino Rappuoli originally tackled [antibiotic resistance](#) through the technology of reverse vaccinology, which was then used to screen for preventive and therapeutic tools against SARS-CoV-2.



Csaba Pál's [resistance evolution](#) project and its proof of concept [Aware](#) provide unprecedented knowledge about [antibiotic resistance](#) evolution and tools to identify at an early stage of drug development antibiotic agents that are less prone to resistance growth.



Madeleine Lowery's [DBSModel](#) project and its proof of concept [DBScontrol](#) aimed at improving the control of [Parkinson's disease](#) symptoms by advancing the use of closed-loop deep brain stimulation.



# Examples of projects contributing to the selected EU4Health areas



Juergen Knoblich's [MiniBrain](#) generated brain organoids, a highly cost-effective tool in the discovery and development of therapies for [neurodegenerative and developmental diseases](#).



The [AGNES](#) project studied the [determinants and modifiers of active ageing](#), including a study on the quality of life during COVID-19 pandemic.



[Maria Collado](#) studies the mechanisms behind the protective role of maternal microbes on the baby's health. Their [MAMI](#) project opens up possibilities for research and applications in the field of personalized nutrition and medicine, for mothers and infants.



[SmartCardiacPatch](#) engineered a miniature heart, 3D-printed using biological materials from human patients, together with the next generation smart implantable [cardiac patches](#) to enable monitoring the organ in real-time.



Daniel Miller leads a world-wide [SmartPhoneSmartAging](#) project examining the [global impact of new social media](#) and how the rise of the smartphone is changing people's relationship to age and health.



The [GutBCells](#) project developed techniques to visualize the immune system and study the antibody [immune response](#) in the gut.

