annual report **2021**

BETTER TOGETHER

15 years of research

ikerbasque
Basque Foundation for Science

EUSKO JAURLARITZA
GOBIERNO VASCO
HEZKUNTZA SAILA
DEPARTAMENTO DE EDUCACIÓN

Science is complex
but it has basic and
irrefutable principles.

15 years
of research

Science is complex, but it has basic and irrefutable principles. An apparently simple knowledge serves as the basis for developing much more complex hypotheses and theories that give rise to new facts.

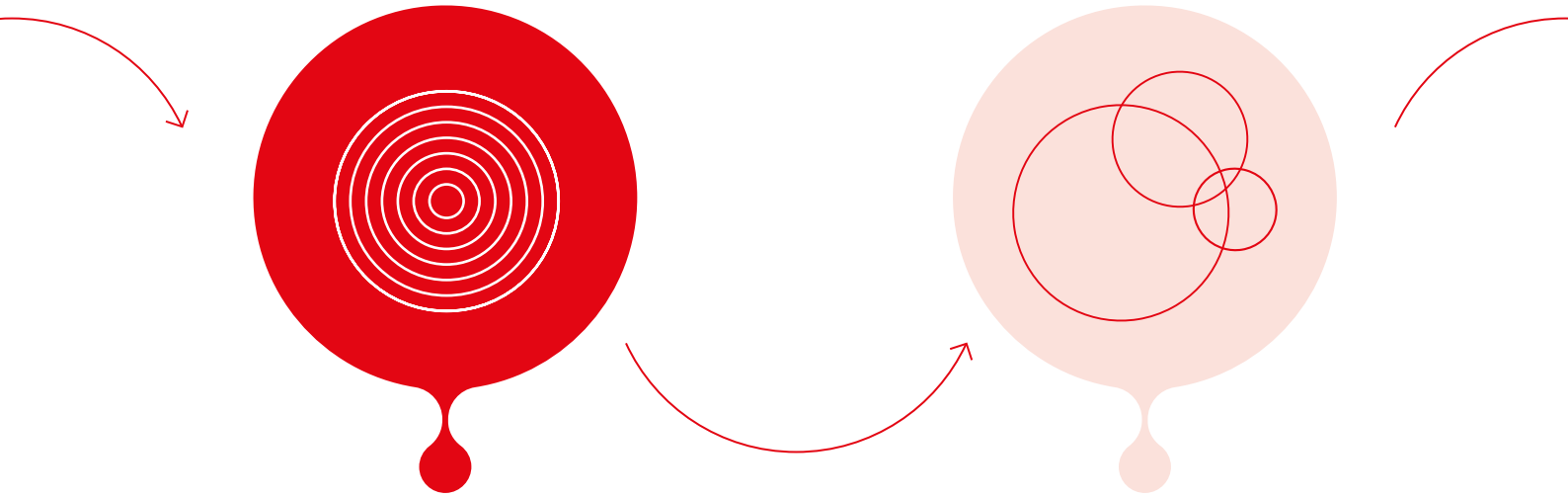
Similarly, the idea of cooperation --a team of people making a collective effort to achieve a common goal-- is simple to understand, but very often difficult to put into practice. However, when applied meaningfully and in a coordinated manner, something as simple as “better together” is extremely useful.

Since the creation of Ikerbasque we have been aware of the importance of our allies: the universities and research centers of the Basque Country. They have made it possible for us to achieve our goals and to be a flexible and efficient organization. We are convinced that cooperation is one of the great factors of evolution, innovation and scientific advances.

After 15 years of experience, the Basque Foundation for Science is a consolidated organization, a scientific benchmark for attracting talent which has 312 researchers from 35 different countries, who carry out their work in all fields of knowledge. In addition, Ikerbasque has a firm commitment to hiring women researchers and to the return of researchers from the Basque Country who currently carry out their work abroad.

Since its creation, Ikerbasque has sought to be a stable and motivating platform from which researchers working in scientific institutions in the Basque Country can continue to ask new questions, posing tantalizing novel challenges and contributing to the generation of new knowledge. In other words: talent in its widest sense to give a better future for all of us.

15 years of research:
Important Milestones



2007/2009

Launched the first International calls aimed to Research Professors. 2009 ended with the hiring of 60 permanent researchers. The creation of 3 new BERC (Basque Excellence Research Centres) in climate change, mathematics and cognitive neuroscience and language. Three existing research centres were consolidated as BERC: DIPC, MFC-CFM and Biophysics Institute.

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2010/2013

Consolidated Ikerbasque by hiring new senior researchers. At the end of this period, 130 research professors were taken on by Ikerbasque. Launched Fellows programme aimed at young researchers. Three new BERC in neuroscience, new materials and macromolecular design. Ikerbasque established the Basque Observatory for Science with the aim of monitoring the evolution and progress of scientific production in the Basque Country.

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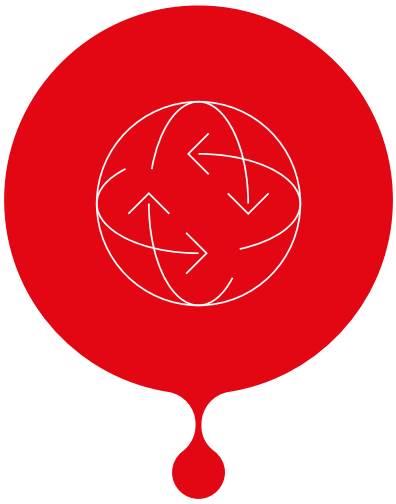

2014/2017

Achieve in maintaining the international calls in dificult economic circumstances. Created the Research Associate category to complement Research Professor and Research Fellow, aimed to cover different stages of the research career.

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2018/2021

To establish Ikerbasque as a hub for atracting scientific talent. BERC centres obtained accreditation and financial funding from Spanish Government.

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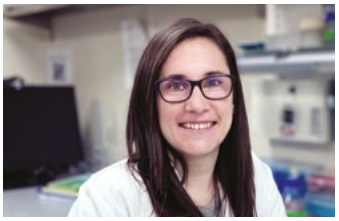
The Twelve challenges **for 2024**

Newcomers

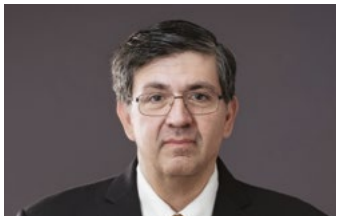
Ana Ardá
CIC BIOGUNE
Chemical glycobiology.



Amaia Arruabarrena
CIC BIOGUNE
Cellular and epigenetic plasticity in cancer.

Nathan Bastian
DIPC
Observational Astrophysics.

Amaia Cipitria
BIODONOSTIA
How biophysical and biochemical properties of native extracellular matrix and synthetic biomaterials guide cell response in tissue regeneration, cancer dormancy and bone metastasis.



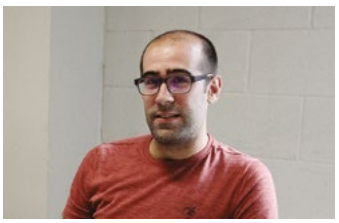
Carlos Coello
BCAM
The solution of highly-complex optimization problems having two or more (often conflicting) objectives using bio-inspired metaheuristics.

Juan Pablo Esquivel
BCMATERIALS
Sustainable tailor-made power sources and self-powered devices.

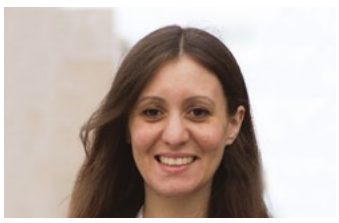
Javier Fernández
Biofisika
Structural and Functional Characterization of the Nuclear Pore Complex; Nuclear Transport; Integrative Structural Characterization of Macromolecular Assemblies.

Jorge Feuchtwanger
UPV/EHU
Particle Accelerators/Ferromagnetic Shape Memory Alloys/Neutronics.

David Gil
FBB-UNIDAD DE BIOFISICA
The study of the physical princiles of the different techniques using Cryo-electron microscopy (Cryo-EM) and microcrystal electron diffraction (MicroED).



Julen Ibáñez
MPC-CFM
Electronic and optical effects in condensed matter physics.



Efthymia Kapnoula
BCBL
Cognitive mechanisms underlying language comprehension and language plasticity across the lifespan, focusing on speech and lexical processing.

Armando Maestro
MPC-CFM
Neutron science applied to the study of biological interfaces and bio-inspired interfacial materials.

James Magnuson
BCBL
Computational modeling of language and cognition.

Heidi Lene Maibom
UPV/EHU
Philosophy of empathy, moral emotions, moral/legal responsibility, mental disorder, and happiness/wellbeing.

Daniel Montoya
BC3
The study of ecological communities, and how they are affected by global change to contribute to an integrative and predictive theory of the effects of global change on ecological communities.

Javier Muñoz
BIOCRUCES
Use mass spectrometry-based proteomics to study how proteins are dynamically regulated in cell signaling processes.

David Novoa
UPV/EHU
The understanding of intense light-matter interactions in microstructured optical fibres and their applications.

Héctor O. de Eguileor
DIPC
Interested in problems at the intersection between soft and hard condensed matter physics.

Iñigo Olalde
UPV/EHU
Use ancient DNA to learn about human population history and social organization in past societies.

Gabriel Ortega
CIC BIOGUNE
Development of electrochemical biosensors and tools for personalized medicine

Itziar Oyarzabal
BCMATERIALS
Coordination complexes with interesting magnetic and/or conductive properties

Kepa Paz
BCBL
Investigate the neural basis of high cognitive functions and how these functions result from interactions between different cognitive components.

Markel Peñalba
Mondragon Unibertsitatea
To understand the marine resource, and the design of novel marine renewable energy systems to efficiently harness the energy of the oceans.

Svetlana Pinet
BCBL
The cognitive and neurophysiological underpinnings of language production through typing, in particular in comparison with speaking.

Marco Piva
CIC BIOGUNE
Mechanisms of cancer progression and treatment resistance.

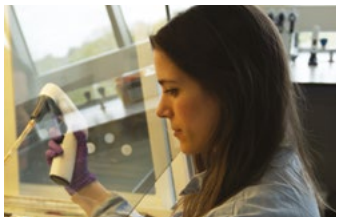
Daniel Reta
UPV/EHU
Working on novel routes toward biradical formation in bioactive molecules, such as small-molecule drugs and chromophores.

Timothy Riffe
UPV/EHU
Demographic methods for population health and mortality.

Ivan Rivilla
UPV/EHU
Synthesis of new organic and organometallic chemical entities with applications such as chemical sensors and chemotherapeutic agents.

Pedro Rodrigues
BIODONOSTIA
The study of cholangiocarcinoma (CCA) pathogenesis, from diagnosis, to risk factors and therapeutic targets

Manuela Ruzzoli
BCBL
Physiological and cognitive mechanisms associated with human behaviour



Janire Sáez
UPV/EHU
The development of organ-on-chip models that aim to understand single and complex biological events occurring in cancer metastasis.

Sergio Sanabria
University of Deusto
Non-invasive quantitative biomarkers based on the analysis of ultrasound radiological images and sensor waveforms, aiming to provide an efficient management of diagnosis and therapy for high-prevalent diseases.

Carlos Sánchez
DIPC
To understand the chemical and biological behaviour of metals in biological systems, by using a mix of spectroscopic and imaging X-ray synchrotron-based techniques.

Ilya Smirnov
BCAM
Singularities in commutative algebra and algebraic geometry.

Carmen Vidaurre
TECNALIA
Development of new multimodal brain imaging methods and their application to neurotechnological problems,

Researchers **Profile**

312
Researchers

170
Research **Professors**

Senior independent researchers in all areas of knowledge with extensive research experience and leadership skills. They are assigned permanently to Basque universities and research centers.
–

62
Research **Associates**

Researchers with an established scientific career in all areas of knowledge.
They have demonstrated maturity, intellectual independence and leadership ability. Ikerbasque offers them permanent research positions.
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80
Research **Fellows**

Young researchers with a promising scientific career and international experience. Ikerbasque offers them a 5 year research position with the aim of establishing a track towards an independent research career.
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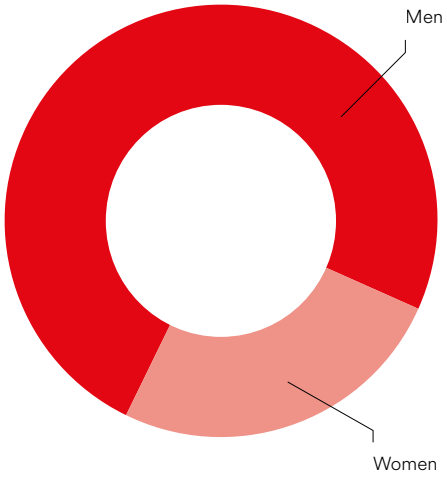
Researchers **Profile**

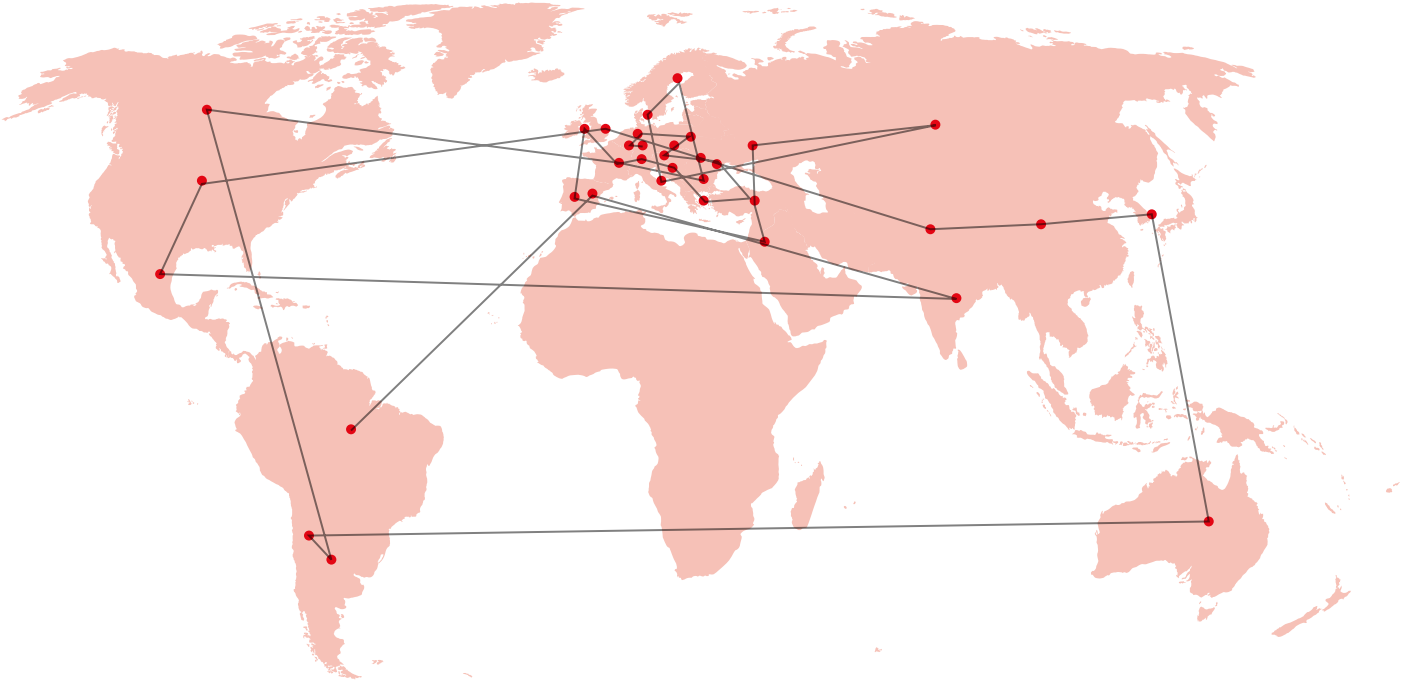
Distribution by sex



233
Men

79
Women

Nationality of Researchers



35
Nationalities

Distribution by knowledge field

70
Life & Medical Sciences

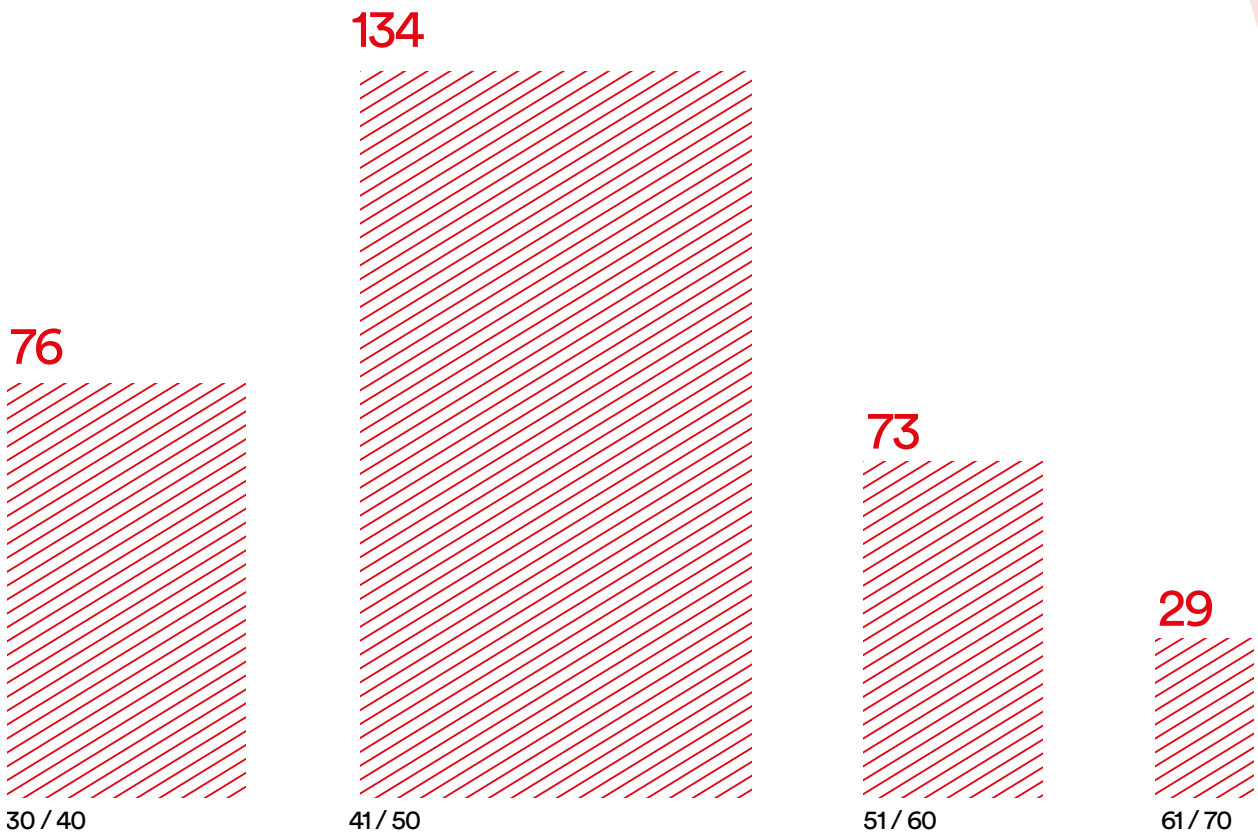
157
Experimental Sciences

37
Social Sciences & Humanities

48
Engineering & Technology

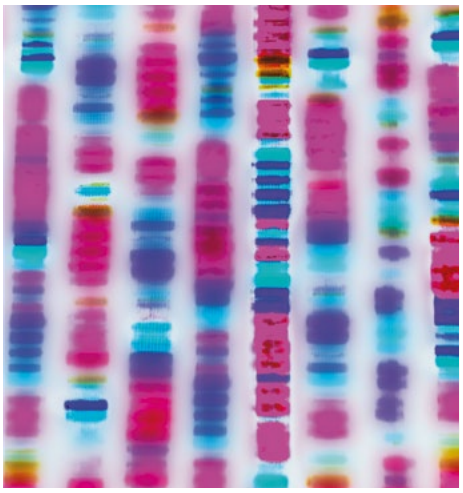
312
Total

Distribution by age



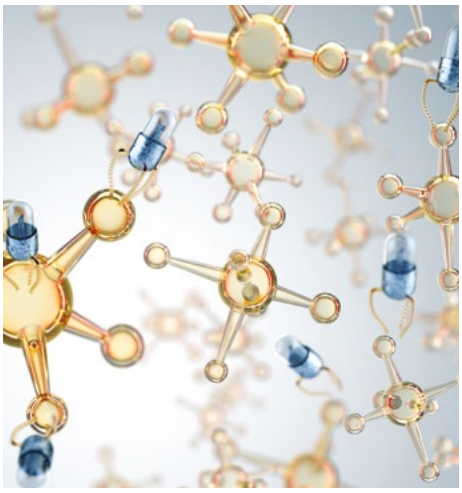
Relevant **Publications**

Ancient DNA reveals the world's oldest family tree



Iñigo Olalde, Ikerbasque researcher at the UPV/EHU, has been the lead geneticist of an analysis of ancient DNA from one of the best-preserved Neolithic tombs in Britain. The analysis has revealed that most of the people buried there were from five continuous generations of a single extended family.
This work, published in Nature, is the first study to reveal in such detail how prehistoric families were structured, and the international team of archaeologists and geneticists say that the results provide new insights into kinship and burial practices in Neolithic times.

Multifunctional metal/protein hybrid nanomaterials for therapeutic intervention and high-sensitivity detection



Researchers from CIC biomaGUNE, led by **Aitziber L. Cortajarena**, developed a simple, versatile and modular strategy for designing custom multifunctional protein hybrid nanomaterials for biotechnological and biomedical applications. Their work has been published in Chemical Science, a journal of the Royal Society of Chemistry.
This study combines, for the first time, the engineering of a therapeutic protein module with the engineering of a nanomaterial-stabilizing module within the same molecule, resulting in a multifunctional hybrid nanocomposite unachievable through conventional material synthesis methodologies.

Gender Differences in peer recognition by Economists

Nagore Iriberri, Ikerbasque researcher at the UPV/EHU, published a paper in Econonometrica which reflected on whether male and female scholars in economics have gotten the same recognition for their scientific contributions. The focus of this study was on awards given to scholars for their scientific contributions, such as recognition by the Econometric Society, American Academy of Arts and Sciences and National Academy of Sciences. Using the data of over 40,000 publishing economists since the early 1900s, the results show the positive evolution of the gap in the probability for women to be selected.

A new method to find modulators of the immune response to COVID-19

Researchers from CIC bioGUNE and the Luxembourg Centre for Systems Biomedicine (LCSB), led by **Antonio del Sol**, published an article in Science Advances which describes a new method to identify molecules that amplify and maintain the inflammatory response upon an infection.
They used their novel method to identify these molecules in COVID-19 patients and suggested new potential targets for therapeutic intervention in severe cases of COVID-19. These potential targets identified by the study are currently being evaluated in animal models together with immunologists from the University of Washington, USA.

Towards a holistic vision of Biodiversity

Unai Pascual, Ikerbasque researcher at BC3, has led an article published in Nature Sustainability in collaboration with an interdisciplinary team of world leading biodiversity scientists from economics, social and political science, geography and ecology.
The paper calls for the idea of biodiversity to be opened up beyond the narrow and limited perspectives that currently dominate biodiversity science, the conservation movement, and policy at local, national and international levels. It argues that reconsideration of the use of the concept of biodiversity could address the multiple and multi-level drivers leading to the current nature crisis around the world.

The disassembly of organs during metamorphosis is a precise process orchestrated by hormones

A study co-led by **Jérôme Solon**, from Biofisika Institutua, has described the disassembly of the Drosophila fly trachea during metamorphosis, which occurs in two distinct stages: one focused on reducing size and the other on cell death. An understanding of this process can shed light on cellular mechanisms related to ageing. This work highlights that to understand complex processes during animal development or disease, not only do we need to decipher the gene expression or the biochemical activity of cells, but we also have to uncover their physical state and understand their mechanics.
The work was published in the journal Current Biology.

Relevant **Data**

€ 37 Million

Return on investment

Total funds that Ikerbasque researchers obtained from competitive calls in 2021

1,484

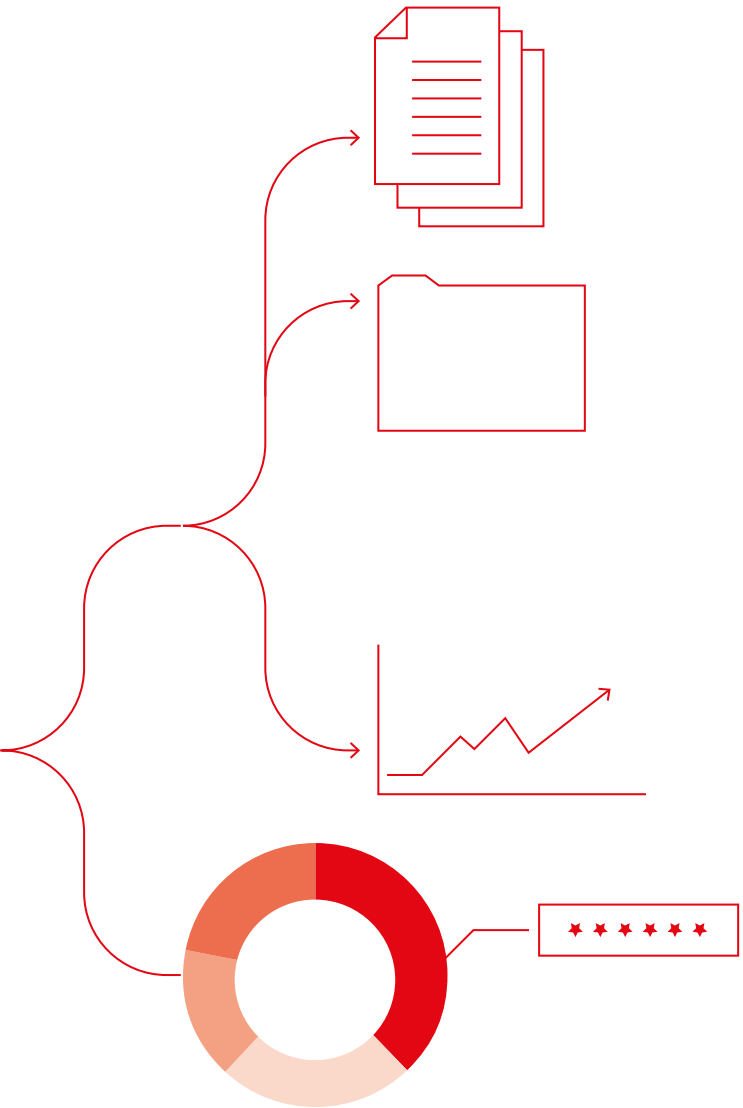
Articles

Published by Ikerbasque researchers in indexed publications

1,300

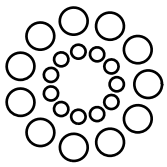
People

working in research groups led by Ikerbasque researchers



15

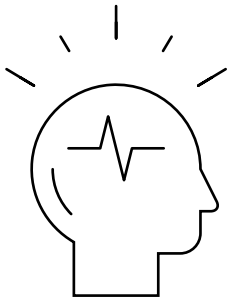
ERC



Ikerbasque researchers are leading 15 ERC grants. The ERC (European Research Council) is the main European organization that promotes research projects based on scientific excellence

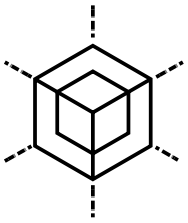
312

Researchers



940

Projects



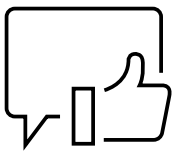
With external funding in which Ikerbasque researchers participate

8

Spin-off companies created in 2021

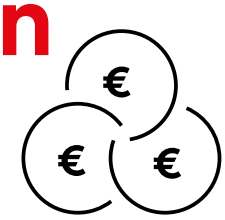
69

PhD theses mentored in 2021



€ 20 Million

Annual Budget



15 Years of Research

Ikerbasque

€295 Million

Return on investment
since 2007

+10,000

Articles published by Ikerbasque
researchers in indexed publications

+250,000

Citations

31 spin-off

Companies created since 2007

34 ERC

Obtained by Ikerbasque researchers

180

H-index

Host Centers

Ikerbasque researchers have joined the following centers in the Basque Country.

Achucarro
Basque center for neurosciences

Azti
Marine and food innovation

BC3
Basque centre for climate change

BCAM
Basque center for applied mathematics

BCBL
Basque center on cognition brain and language

BCMaterials
Basque center for materials, applications & nanostructures

Biocruces Bizkaia
Health Research Institute

Biodonostia
Health Research Institute

Biofisika Institutua
Basque centre for biophysics

CIC energiGUNE
Energy cooperative research center

CIC bioGUNE
Center for cooperative research in biosciences

CIC biomaGUNE
Center for cooperative research in biomaterials

CIC nanoGUNE Nanoscience cooperative research center

CFM-MPC
Materials physics center

Deusto
University of Deusto

DIPC
Donostia international physics center

Globernance
Institute for democratic governance

IISL/IISJ
Law&Society: Socio-legal studies

Neiker
Basque Institute for Agricultural Research and Development

Polymat
Basque center for macromolecular design and engineering

Tecnalia
Technology corporation

Tecnun
University of Navarra

Mondragon Unibertsitatea
University of Mondragon

UPV/EHU
University of the Basque Country

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