ikerbasque
Basque Foundation for Science

WE ARE CURIOUS

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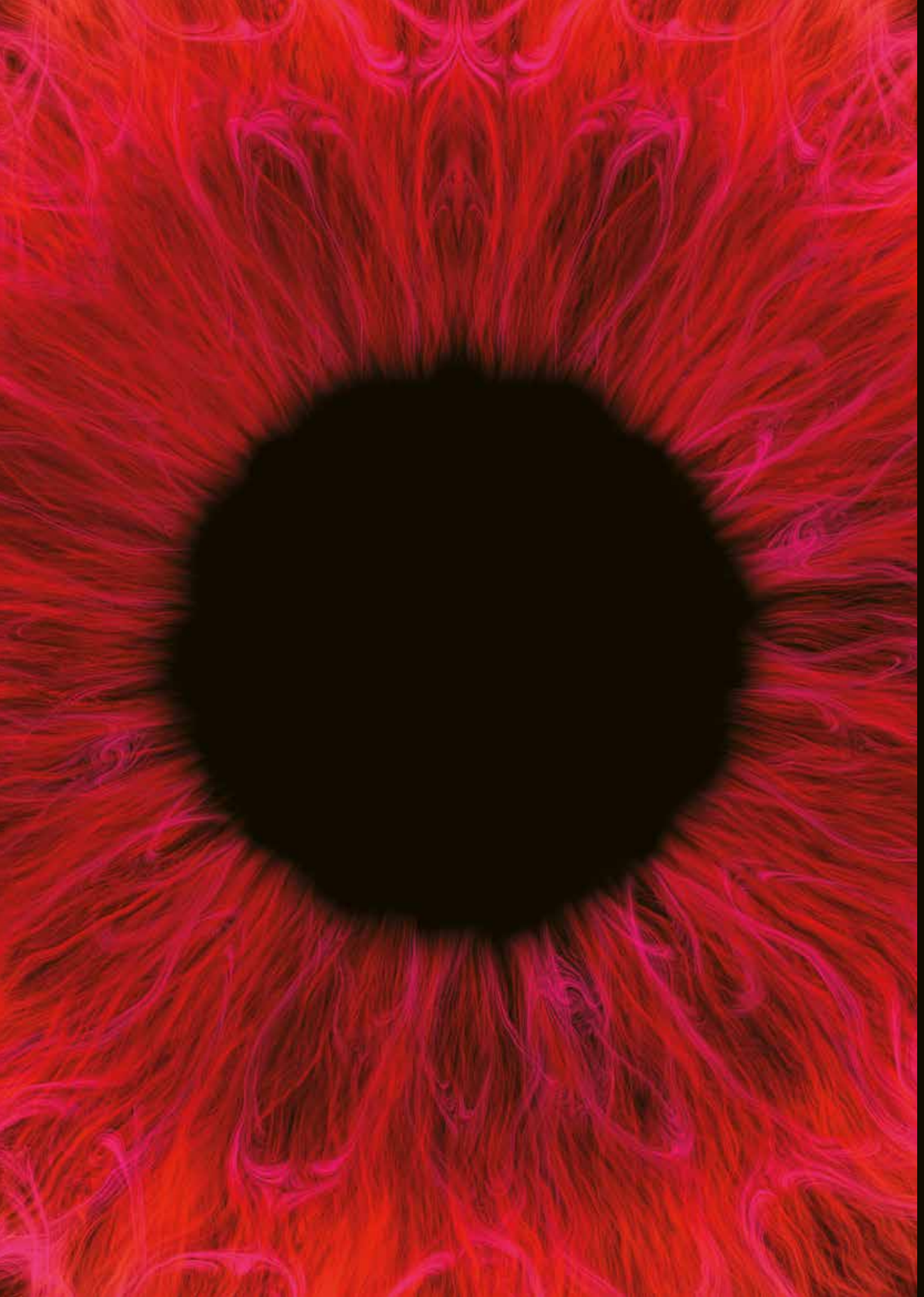


Annual Report

WE ARE CURIOUS

2022

ikerbasque

In 2007, The Basque Government created Ikerbasque to reinforce the Basque scientific system through the attraction, recovery and retention of researchers from all around the world.

The Basque Foundation for Science is a consolidated organization with 345 researchers from 35 different countries, from all fields of knowledge and with a firm commitment to the hiring of female researchers, as well as to promoting the return of Basque researchers who are currently working outside of the Basque Country.

For all of this, Ikerbasque provides a comprehensive offer that has long term stability, covering the different stages of the researcher's career. Our researchers develop their work in the different universities and research centers of the Basque Country. This is all thanks to our allies, those who make it possible for us to achieve our goals and who allow us to see ourselves as an organization unrestricted by our physical boundaries.

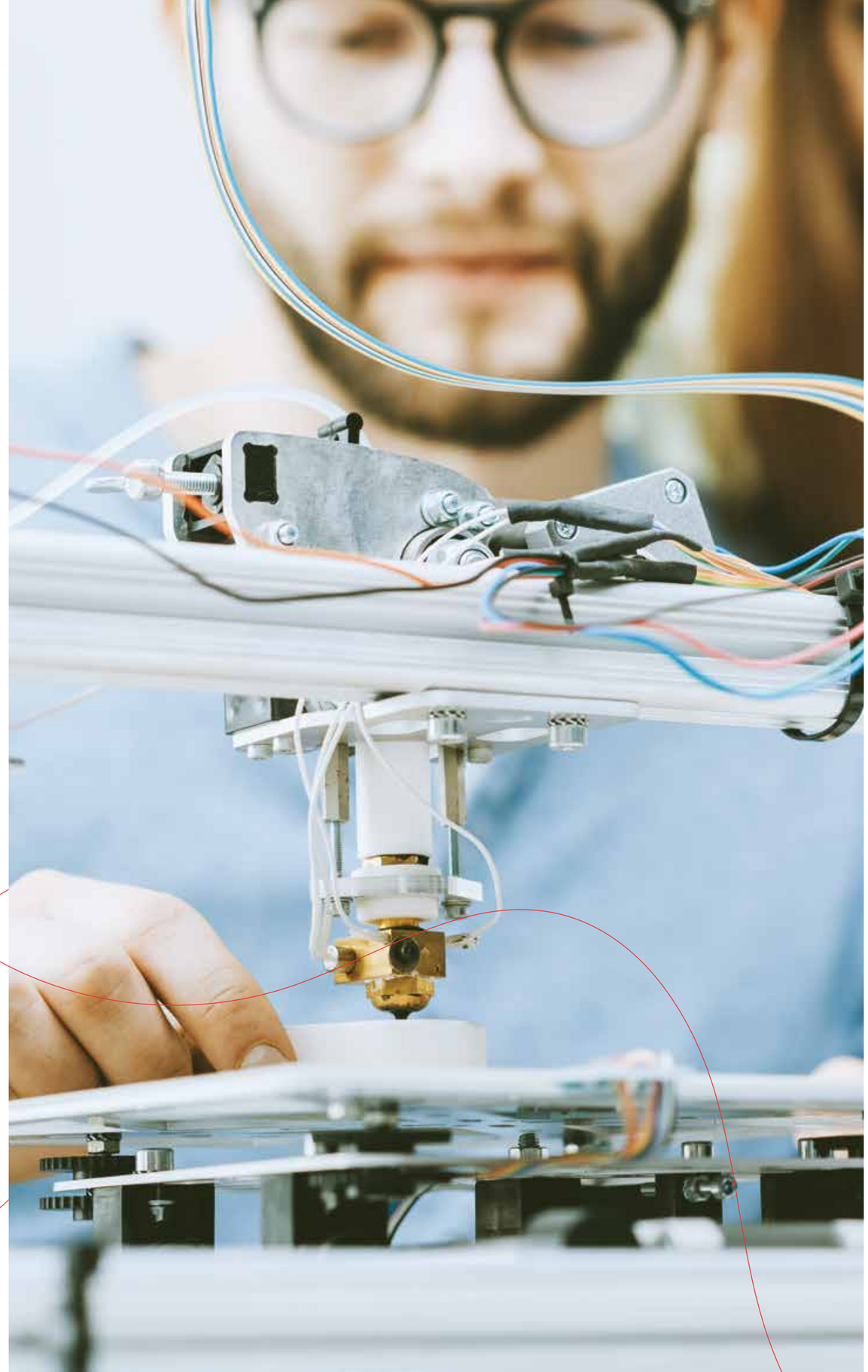
Since Ikerbasque's creation, we have sought to be a stable yet motivating platform from which scientists and scientific institutions in the Basque Country can continue asking themselves new questions and contributing to the challenge of generating new knowledge.

An ability to reason, persistence, critical spirit and open-mindedness are essential attitudes for a researcher, but if we had to choose one of them, that would be curiosity.

Curiosity moves us to explain the world in which we live. Being curious is having the strength of thinking and asking questions. Curiosity makes us want to understand the things, not just know about them.

And curiosity has brought us here.
This Report is the answer to the intellectual challenge of understanding things. It is the answer to curiosity.

WE ARE CURIOUS



The Twelve challenges for **2024**

1.
Basque Country to reach **9,000 annual scientific** publications.

2.
60% of scientific productions publications to be carried out with **international collaboration.**

3.
A **third** of Basque Country´s publication to appear in the **top 10% of maximum impact journals** (D1).

4.
BERCs to publish **1,700 scientific articles, 18%** of the Basque total.

5.
Ikerbasque to hire **100 new researchers.**

6.
Ikerbasque to recruit **30 Basque fellows.**

7.
More than 40% of new research staff recruited by ikerbasque in 2024 to be **women.**

8.
Ikerbasque researchers to publish more than **1,600 scientific articles** in 2024.

9.
50% of Ikerbasque publications in 2024 to appear in the **top 10%** of **maximum impact journals** (D1).

10.
Ikerbasque to archive a return of **150 million euros.**

11.
Ikerbasque researchers to develop **20 ERCs.**

12.
Ikerbasque researches to lead, **1,500 people in their research groups.**

New Incomers

Guillermo Abascal
UPV/EHU
Molecular architecture of multi-subunit complexes involved in DNA/RNA-associated functions.

Arantxa Acera
UPV/EHU
Lipidomics and proteomics in tear samples.

Miguel Aguilera
BCAM
Nonequilibrium neural computation, Information thermodynamics.

Ion Andreu
Biofisika Institutua
Cell and tissue mechanobiology.

Amaia Arranz
UPV/EHU
Archaeobotany, Prehistory, Archaeology: study of human-environment interactions.

Mariana Astiz
ACHUCARRO
Circadian physiology of neurons and glia, perinatal development.

Anna Barbuscia
UPV/EHU
Family demography and fertility.

Nora Bengoa
ACHUCARRO
Aggregation and inflammation in neurodegenerative diseases.

Andrei Bernevig
DIPC
Discovering the nature of quantum matter.

Federico Calle-Vallejo
UPV/EHU
Computational electrocatalysis.

Marité Cárdenas
Biofisika Institutua
Membrane Biophysics and Biocolloids.

Susana Carregal Romero
CIC biomaGUNE
Multifunctional and bioinspired materials for biomedicine and biotechnology.

Nerea Casado
POLYMAT
Polymeric mixed ionic-electronic conductors for bioelectronics and energy storage.

Juan Collar
DIPC
Neutrino and dark matter physics.

Agustín del Prado
BC3
Climate change and agriculture. Terrestrial Ecosystems.

Sabine Frerichs
IISL-IISJ
Sociology of law; interactions of law, economy, and society.

Tobias Grass
DIPC
Theory of controllable quantum matter, quantum simulation, quantum optics.

Tamas Horvath
ACHUCARRO
The signaling flow and regulatory relationship within and between brain cells and peripheral organs.

Tania Huedo-Medina
UPV/EHU
Statistical models of health behavior determinants.

Ivan Infante
BCMATERIALS
Computational and predictive nanochemistry. Energy conversion.

Oihana Iriondo
CIC bioGUNE
Molecular determinants of prostate cancer persister cells.

Marie Lallier
BCBL
Language acquisition & Developmental Dyslexia.

Garikoitz Lerma-Usabiaga
BCBL
Neural basis of vision and reading.

Timothy Long
POLYMAT
Sustainable macromolecular materials and manufacturing.

Anne Lonjou
UPV/EHU
Birational geometry and geometric group theory.

Pablo Manzano
BC3
Transdisciplinary research in sustainability of livestock-based socioecosystems.

Beatriz Martín
CIC nanoGUNE
Development and spectroscopy study of low-dimensional materials.

Karolina Milowska
CIC nanoGUNE
Atomistic simulations of low-dimensional systems for sustainable energy generation.

Marta Olazabal
BC3
Urban climate governance.

Dennis Ott
UPV/EHU
Formal syntax and pragmatics.

Paramaconi Rodríguez
CIC energiGIGUNE
Electrocatalysis for energy applications and environmental remediation.

Edurne Rujas
UPV/EHU
Antibody engineering for therapeutic purposes.

Rosario Sánchez-Pernaute
Biocruces Bizkaia
Advanced Therapies for Neurodegenerative disorders.

Denis Scaini
UPV/EHU
Nanotechnology applied to neuroscience and artificial 3D neuronal cell assemblies.

Thomas C. Scott-Phillips
UPV/EHU
Cognitive pragmatics; Evolution of language & culture.

Beatriz Trastoy
Biocruces Bizkaia
Structural Glycoimmunology.

Stepan Tsirkin
MPC - CFM
Berry-phase effects on transport properties of solids.

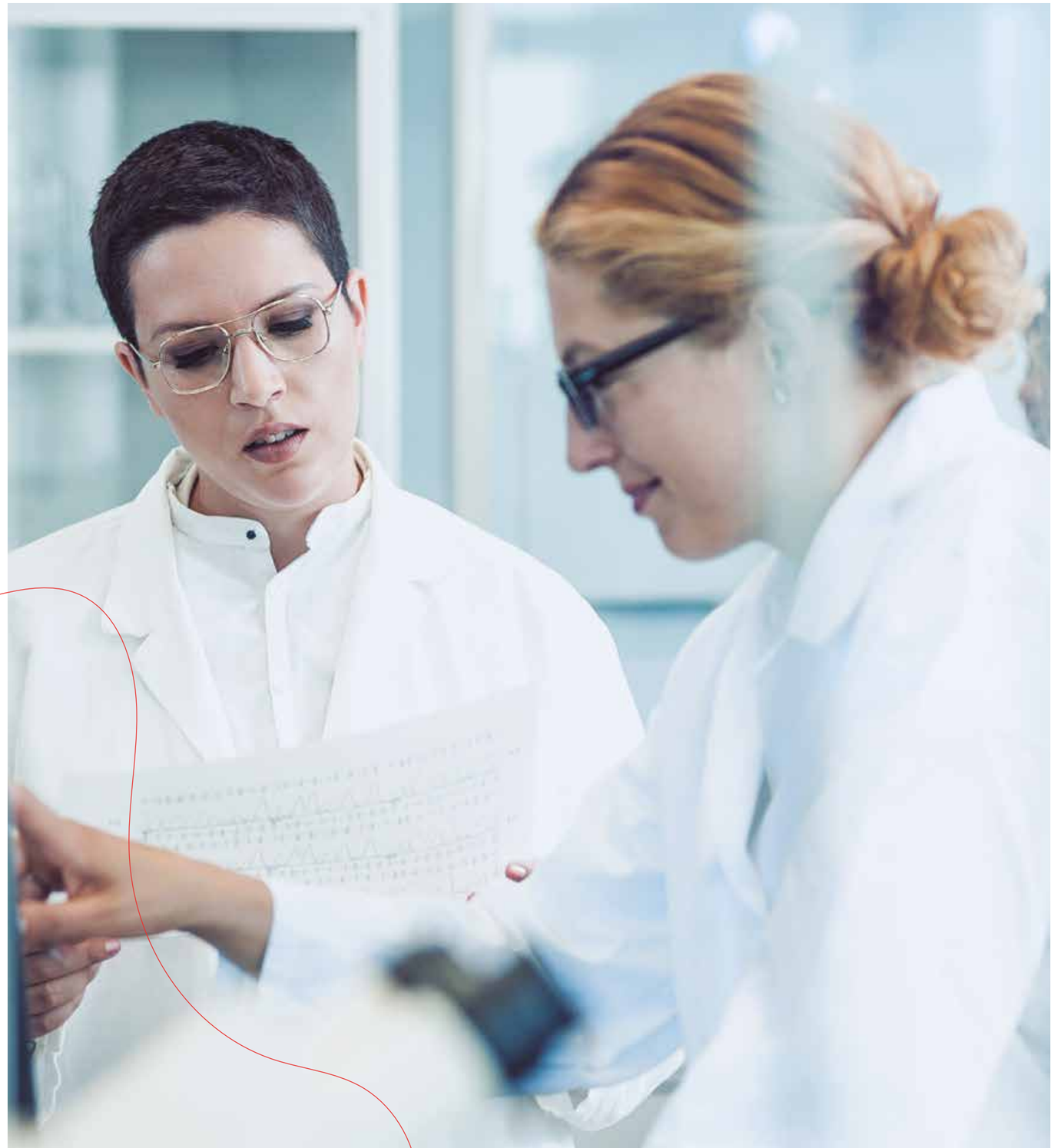
Luca Unione
CIC bioGUNE
Molecular recognition in Host/Pathogen interactions.

Iñigo Urteaga
BCAM
Methodological and applied aspects of probabilistic machine learning.

Luis Varela
ACHUCARRO
Role of hypothalamic astrocytes in the regulation of energy balance.

Ester Verde
MPC - CFM
Design and synthesis of smart single chain nanoparticles.

345 Researchers



178 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.

73 Research **Associates**

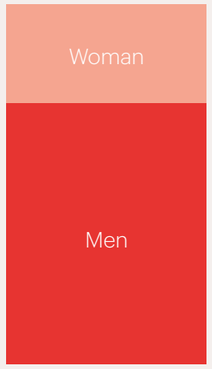
Researchers with an established scientific career in all areas of knowledge.
They have demonstrated maturity, intellectual independence and leadership ability. Ikerbasque offers them permanent research positions.

94 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.

Reserchers Profile

Distribution by sex.



94
Woman

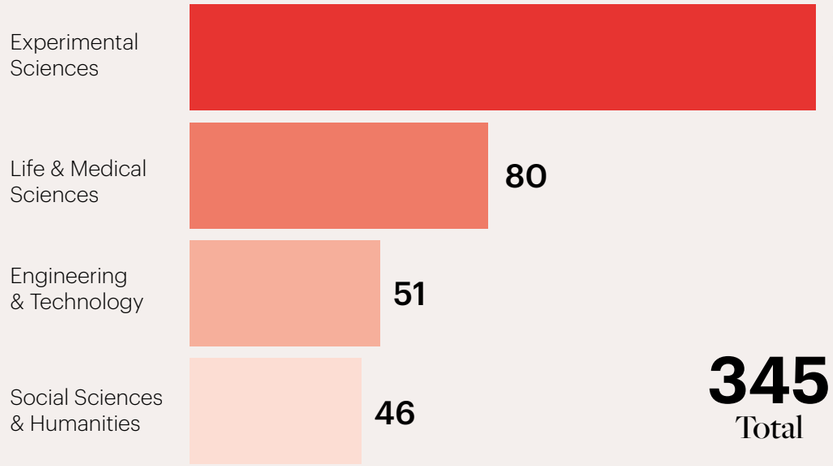
251
Men

Nationality of Researchers.

35
Nationalities

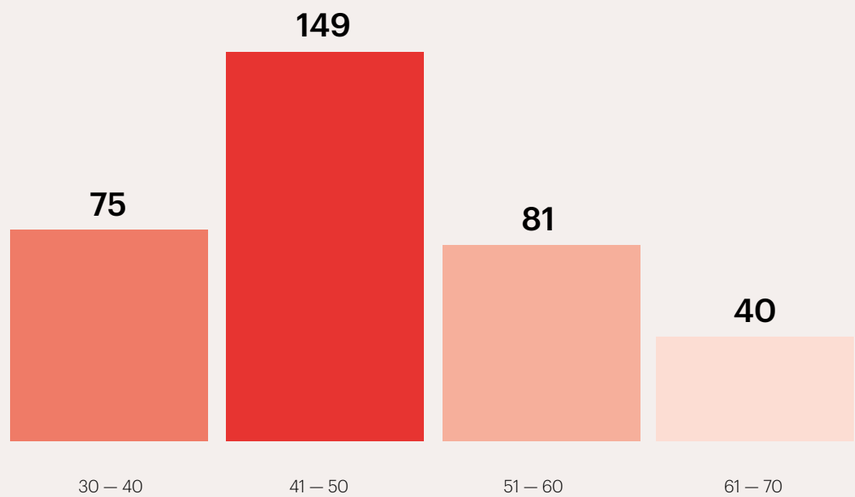
Australia
Austria
Belgium
Brazil
Canada
Chile
China
Colombia
Croatia
Czech Republic
Denmark
France
Germany
Greece
Hungary
India
Ireland
Israel
Italy
Macedonia
Mexico
Netherlands
Pakistan
Poland
Portugal
Romania
Russia
South Korea
Spain
Sweden
Switzerland
Turkey
Ukraine
United Kingdom
United States

Distribution by knowledge field.

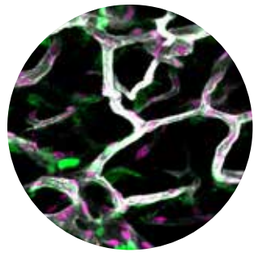


345
Total

Distribution by age.



Relevant Publications



A study identifies obesity-regulating molecular communication guided by blood vessels.

The abundance and function of blood vessels in adipose tissue determines the development of obesity. This is the surprising conclusion drawn from a study co-led by **Arkaitz Carracedo,** Ikerbasque researcher at CIC bioGUNE. Years of research have led to the conclusion that blood vessels use a communication language based on small molecules, known as metabolites, to instruct adipose tissue. The adipocytes, in response to the message from the blood vessels, release fats, which the vessels take up as food to proliferate. This study sheds light on the importance of blood vessels in regulating health and disease in our bodies.

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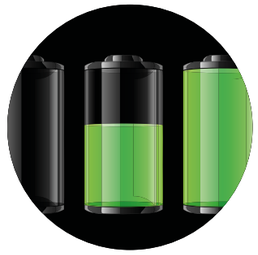
The study was published in the journal NATURE METABOLISM.



Enhancing Battery Performance.

Nagore Ortiz-Vitoriano, Ikerbasque researcher at CIC energiGUNE, has investigated the use of two electrolyte additives in order to promote the stabilization of the discharge products in Na-O2 batteries. These batteries, unlike Li-ion which rely on intercalation of Li+ between the two electrodes, are based on conversion reactions. This means that during discharge sodium oxides are formed on the surface of the cathode or in the electrolyte which precipitate afterwards on the cathode. This process, the so called oxygen reduction reaction, determines the size and distribution of the products and in this study they have demonstrated the use of Cs cation as a great additive for Na-O2 batteries with enhanced stability and longer cycle life.

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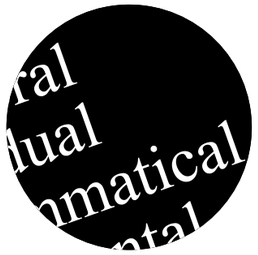
The study was published in ADVANCED ENERGY MATERIALS.



Pedagogical translanguaging.

A study co-led by **Durk Gorter**, Ikerbasque researcher at UPV/EHU has explored the identification of cognates (words with the same linguistic origin) in three languages in relation to language background and metalinguistic awareness. This new approach aims at improving language by using resources from the learner's whole linguistic repertoire. The results among primary school students indicate that linguistic characteristics of cognates are important, but having Basque or Spanish as a first language is not. Teaching cognates creates greater awareness and using all languages in the students' repertoire provides more opportunities for language learning.

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The study was published in the International Journal of BILINGUAL EDUCATION AND BILINGUALISM.

Advances in celiac disease based on RNA modifications.

Celiac disease is an autoimmune disorder affecting the intestine that develops in response to dietary gluten in individuals with genetic predisposition. **Ainara Castellanos**, Ikerbasque researcher at UPV/EHU, has led an study in which they have shown for the first time that gluten has the ability to alter RNA modifications. Additionally, they have described the implication of a genetic variant associated to celiac disease in the development of the intestinal inflammation characteristic of this disease. The results provide novel information about the development of inflammation and open the door to the development of novel therapeutic interventions for celiac disease based on RNA modifications.

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The study was published in GUT.

A supernova in distant space allows us to understand the origin of the elements of the universe.

A supernova is a stellar explosion, which occurs when the lives of some really massive stars come to an end. An international team with the participation of **Tom Broadhurst**, Ikerbasque researcher at UPV/EHU and Associate of the Donostia International Physics Center (DIPC), has obtained three images, each in a different colour, of the same supernova in the distant universe, thanks to the magnifying power of a galaxy located in the foreground. The discovery was made possible by images captured by the Hubble Space Telescope.

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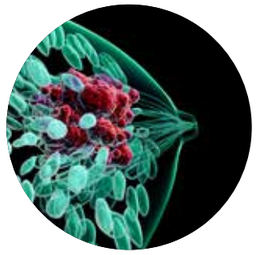
The results of the research were published in the prestigious journal NATURE.



New mechanism that explains how the different cells within breast tumors communicate with each other.

Maria Caffarel, Ikerbasque researcher at Biodonostia, and her group have showed for the first time that the proinflammatory cytokine Oncostatin M (OSM) favors breast cancer progression and metastasis, acting as a messenger between different populations of the tumor microenvironment. According to the results of the research, tumors with high levels of OSM are associated with a worse prognosis in patients, opening a new possible treatment strategy based on inhibiting OSM in breast cancer tumors. This finding may lead to the development of new therapeutic strategies for breast cancer.

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The article was published in the Journal of CLINICAL INVESTIGATION.

Relevant Data

€+40Million

Return on investment.

Total funds that Ikerbasque researchers obtained from competitive calls in 2022.

1,437

Articles.

Published by Ikerbasque researchers in indexed publications.

1,593

People.

Working in research groups led by Ikerbasque

1,058

Projects.
With external funding in which Ikerbasque researchers participate.

345

Researchers.

€22Million

Annual Budget.

88

PhD theses mentored in 2022.

20

ERC.
Led by Ikerbasque researchers in 2022. The ERC (European Research Council) is the main European organization that promotes research projects based on scientific excellence.

Accumulated Data

€335 Million

Return on investment since 2007.

+12,000

Articles published by Ikerbasque researchers in indexed publications.

+335,000

Citations.

35 spin-off

Created by Ikerbasque researchers.

41 ERC

Obtained by Ikerbasque researchers.

197

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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