2021 Annual report

The year that brings us closer to early detection

pasqual maragall foundation

barcelonaβeta BRAIN RESEARCH CENTER

2021

The year that brings us closer to early detection

We are moving forward to make research a reality for people at risk of developing Alzheimer's.

Edition **Pasqual Maragall Foundation**
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Publication date June 2022

2021 Annual report

Greetings

Like every year, the time has come to take stock of the work carried out throughout 2021 and to render accounts. It is a great responsibility and, at the same time, a very satisfying task that allows us to observe with perspective the path traveled and the achievements made.

These pages that you will find below are a summary of the intense activity of the Pasqual Maragall Foundation in 2021, a year that was once again complex, marked by the COVID-19 pandemic but in which, once again, we adapted to the situation and we managed to keep our projects moving forward.

First of all, I want to highlight a figure that makes us particularly excited: **50,000.**

50,000 is the number of partners, patrons, donors and collaborators who gave us their support in 2021 and it is the first milestone that we must highlight. Without you, everything you will read below would not have been possible. We thank you for the trust you give us to work together for a future without Alzheimer's.

2021 was a year of scientific advances that we owe to the work of our research teams. First, we identified a new blood biomarker to further advance the early detection of Alzheimer's. We also launched the Beta-AARC study, focused on discovering new biomarkers that help detect the disease early. In addition, we are making progress in studying the possible benefits of eating omega-3 foods for our brain; in detecting the relationship between cognitive impairment and cardiovascular health; and in the finding that weight loss could be an indicator of the development of Alzheimer's.

Another very important milestone in 2021, achieved once again thanks to solidarity, was the acceleration of the construction in our facilities of the most advanced laboratory in Spain and one of the most sophisticated in the world for the early detection of Alzheimer's. The laboratory is already a reality this 2022 and will focus on the validation of biomarkers characteristic of the beginning of the biological process of Alzheimer's and will allow preventive and therapeutic actions in a not too distant future.

On the other hand, we continue our work to change the social consideration of the disease. We have offered our knowledge in awareness campaigns and through the more than 200 informative articles published on our blog, 'Let's talk about Alzheimer's', which last year exceeded two million visits (68% more than in 2020). We also launched the new online emotional support and training program for caregivers, 'Learn to care and take care of yourself', which brought together 12 therapeutic groups through screens, bridging physical distances as a result of the pandemic.

50,000 is the number of partners, patrons, donors and collaborators who gave us their support in 2021

Likewise, in our desire to ensure that society and institutions recognise the importance of a disease that affects one in 10 people over 65 years of age, we demand in the Congress of Deputies that Alzheimer's be a political priority and that our society equips itself with more resources for research and for families.

All this, and what you will find detailed in these pages, we have achieved thanks to sponsors, patrons, the more than 50,000 members, partners, donors, participants in our studies and the human team of the Pasqual Maragall Foundation.

It is time to congratulate ourselves on all these achievements and to reaffirm our shared commitment to defeat Alzheimer's.
50,000 thanks!

Arcadi Navarro
Director

Barcelona, june 2022

determination.

“Nowhere is it written that Alzheimer's is invincible”

Pasqual Maragall said it, and we will not tire of working to achieve a future without Alzheimer's or neurodegenerative diseases.

01.

1.01 Alzheimer's today

Every year **10 million cases** of dementia are recorded around the world, most of them caused by Alzheimer's[1]. At the Pasqual Maragall Foundation and the Barcelona βeta Brain Research Center we are convinced that prevention is key to stopping the progression of the disease. For this reason, we concentrate our research efforts on the **early diagnosis** of Alzheimer's, which will allow us to develop treatments that act before the damage caused by the disease is irreversible.

Early diagnosis allows those affected to receive treatment and specialized assistance when they are most effective, anticipate decision-making and reduce the stress associated with uncertainty. Faced with this reality, we also work to eliminate misinformation and the social stigma that still surrounds Alzheimer's disease and other forms of dementia, and that make it difficult to access early diagnosis.

Every year 10 million cases of dementia are recorded around the world, most of them caused by Alzheimer's.

50 Million
cases

Every 3 seconds a new case of dementia is diagnosed in the world.

900,000
cases

1 in 10 people over the age of 65 have Alzheimer's.

94% of Spaniards would like to know if they are in the early stage of Alzheimer's[2]

46% of people with dementia and their carers identify fear of diagnosis and stigma as barriers to diagnosis[3]

Between 30% and 40% of Alzheimer's cases would be undiagnosed[4]

1. Data from the World Alzheimer Report 2015: The global impact of dementia.
2. Data from the survey "Attitudes and perceptions of the Spanish population on Alzheimer's", conducted by the Pasqual Maragall Foundation.
3. Data from the World Alzheimer Report 2021: Journey through the diagnosis of dementia.
4. Data from the Spanish Society of Neurology.

1.02 2021: we move forward to make research a reality for people at risk of developing Alzheimer's

January
Heart health and brain health

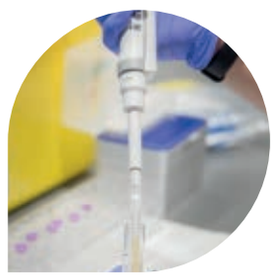
The CNIC, in collaboration with the Barcelonaβeta Brain Research Center (BBRC) and Banco Santander, reveals that **the relationship between cardiovascular disease and cognitive impairment factors** occurs many years before the first clinical symptoms of either of the two pathologies appear.

April
The effects of omega-3 on the brain

People without cognitive problems, but with a higher genetic risk of developing Alzheimer's, have **certain areas of the brain that are more resilient** to the disease thanks to the omega-3 fatty acids of oily fish. It was discovered by a study led by the BBRC.

June
Weight loss and Alzheimer's

The BBRC research team, thanks to the support of the "la Caixa" Foundation, points out that **weight loss could be an indicator of a higher risk of developing Alzheimer's**.



September
Our social base is mobilized to equip a pioneering laboratory

We launch the fundraising campaign "A news to remember". Thanks to the participation of many partners and donors, we obtained the necessary funds to publish a headline that will never be forgotten: **the creation of the most advanced laboratory in Spain** to detect Alzheimer's early with a simple blood test.

March
Brain Film Fest

We celebrate the fourth international film festival on the brain. An edition marked by the current situation of the **pandemic and its psychological impact** on people.

June
One more step towards early diagnosis

The BBRC, the research center of the Pasqual Maragall Foundation, promotes a new line of research. Led by Dr. Marc Suárez-Calvet, this new group of neuroscientists will focus on **identifying blood biomarkers to improve the early diagnosis** of Alzheimer's.

July
New program for caregivers

We launch the **online training and emotional support program 'Learn to take care of yourself'**, with the aim of providing caregivers of their relatives with Alzheimer's with the necessary tools to face day-to-day life with a better quality of life.

September

We demand in Congress that Alzheimer's be a strategic political priority

Led by the Pasqual Maragall Foundation, entities and experts unite our voices to ask for a boost in research and more resources to improve the quality of life of sick people, family members and caregivers.

October

We finalize the protocol of action to minimize the cognitive and emotional impact on the users of residences in a pandemic

At the request of the Municipal Institute of Social Services (IMSS) of the Barcelona City Council, we designed, energized and evaluated a protocol for residences in times of pandemic. In total, we intervened in four residential centers with 133 participating professionals and 718 actions were carried out with the residents.

November

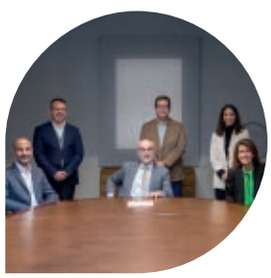
Second edition of "Remember"

The cycle of conferences, which was held virtually, had **more than 1,600 registered**. The talks addressed interesting topics: early detection through a blood test, managing uncertainty in the face of Alzheimer's, and how the fats in our diet help fight the disease.

November

Music to remember

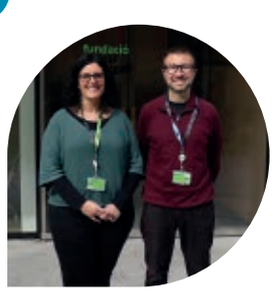
BBRC researchers detect that **music related to life experiences** activates different parts of the brain than those involved in the natural process of remembering.



November

Betascreen is born, the first spin-off of the Pasqual Maragall Foundation

The BBRC culminates the research project on artificial intelligence algorithms developed five years ago with the constitution of the company Betascreen. Thanks to the application of this technology, it will be possible to predict the abnormality of Alzheimer's biomarkers from brain MRIs and thus reduce the recruitment costs of Alzheimer's prevention clinical trials by up to 50%.



December

Air Pollution and Alzheimer's

We link increased exposure to nitrogen dioxide with **higher levels of biomarkers** of Alzheimer's disease.

December

We reach 50,000 members

Our support network continues to grow. Thanks to the contributions of our partners, we make possible the development of research studies and dissemination of Alzheimer's, as well as support for families living with the disease.

Research Social

1.03 Year in numbers

Aggregated data from the Pasqual Maragall Foundation and the Barcelonaβeta Brain Research Center.

The two entities undergo an external annual accounts audit.

Budget

Budget

14,447,415 €

Pasqual Maragall Foundation

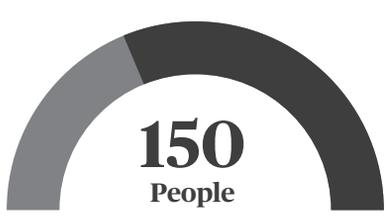
9,116,996 €

BBRC Research Center

5,330,419 €

63 % FPM
37 % BBRC

Human team



150
People

33,3 %
50 Men

66,6 %
100 Women

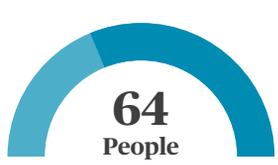
Pasqual Maragall Foundation

86
People

31,4 %
27 Men

68,6 %
59 Women

BBRC Reseaech Center



64
People

36 %
23 Men

64 %
41 Women

2021

Divulgation

1,568
Appearances in the media

+ 85,000
Followers on social networks

+ 2,300,000
Visits to the Blog "Let's talk about Alzheimer's"

30
support groups for caregivers in Barcelona, Madrid, Lleida, Vigo, Castellón, Alcalá de Henares, Tenerife and online

295
Participating caregivers

Research

+ 1,500
Visits to participants

+ 13,000
Samples processed

+ 600
MRIs

Social suport

50,005
Members at the end of the year

+ 6,000
Donations

244
Solidarity initiatives

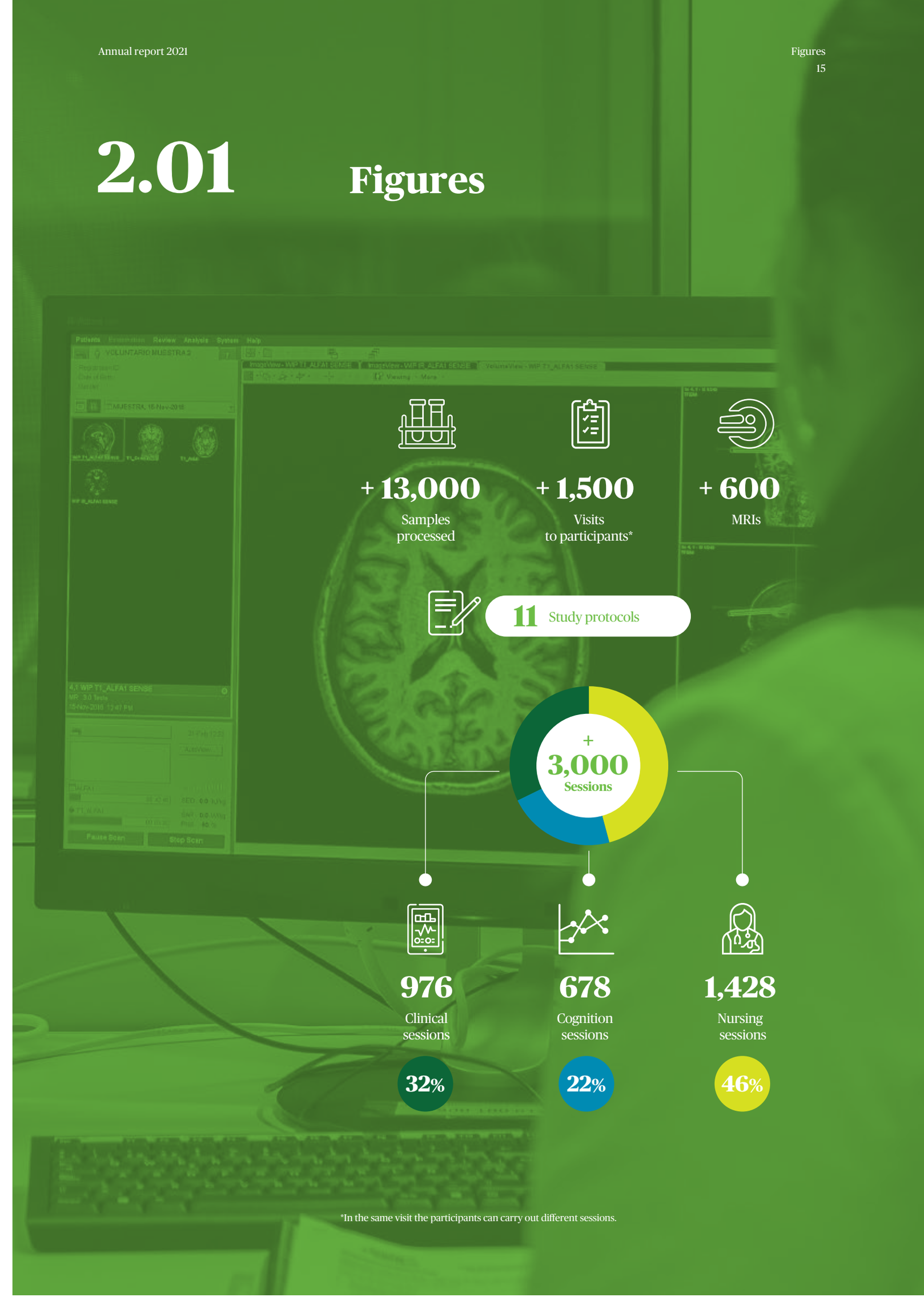
credibility.

Scientific rigor and expert knowledge in everything we do.

At the Barcelonaβeta Brain Research Center (BBRC) we are dedicated to research into Alzheimer's prevention. Thanks to the experience, rigor and high competence of our scientific team, we are providing new knowledge to one day be able to prevent, or at least delay, the onset of the disease.

02.

2.01 Figures



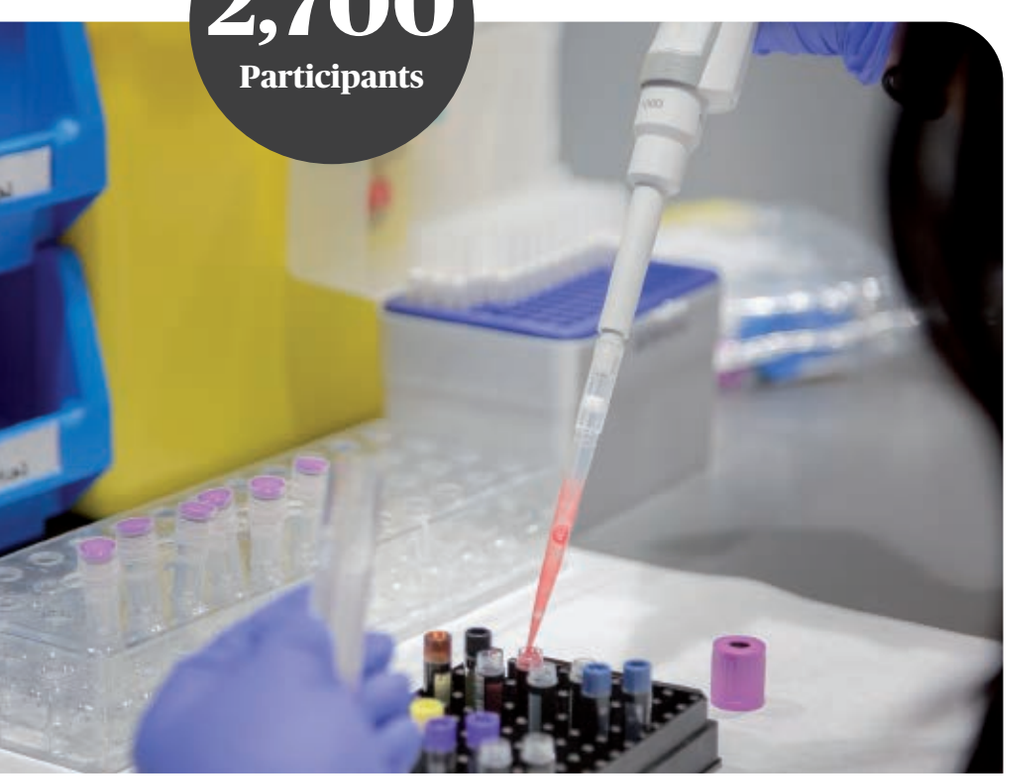
*In the same visit the participants can carry out different sessions.

2.02 Alfa Study

The Alfa Study is a research platform to identify early features of Alzheimer's disease. Launched in 2013 thanks to the support of the "la Caixa" Foundation, it stands out internationally for the volume of participants, which exceeds **2,700 people without cognitive alterations**, between 45 and 75 years old, most of whom are sons and daughters of people with Alzheimer's.

The objective of the Alfa Study is to gather information from the preclinical phase of Alzheimer's in order to understand the natural history of the disease. Knowing the **biomarkers and risk factors** for Alzheimer's opens the door to early detection and the development of new prevention strategies.

2,700
Participants



Alfa participants' initial visit included a full clinical and cognitive evaluation, questionnaires about lifestyle and other risk factors related to Alzheimer's disease, DNA extractions, and MRI (to a subgroup). Participants in the Alfa study were subsequently invited to take part in other research projects, such as the Alfa+ cohort study, in which additional tests such as neuroimaging and cerebrospinal fluid biomarker analysis are carried out on a regular basis.

The exhaustive characterization of the Alfa Study participants allows their subsequent inclusion in different studies and trials to prevent Alzheimer's disease. BBRC researchers use data from the Alfa study to test different hypotheses and publish numerous relevant advances in prestigious scientific journals.

The Alfa Study receives the support of:

"la Caixa" Foundation

2.03 Alzheimer's Prevention Program

The research of the BBRC's Alzheimer's Prevention Program focuses on the preclinical phase of Alzheimer's disease, a period of up to 20 years before the appearance of the first symptoms in which changes in the brain associated with Alzheimer's already occur.

The main objective of our research is to be able to detect Alzheimer's early and design prevention programs that delay or stop the appearance of its symptoms. To this end, the BBRC studies Alzheimer's from multiple perspectives: clinical, cognitive, genetic and fluid and neuroimaging markers.

The Alzheimer's Prevention Program is currently structured into four research groups, two of them created in 2021.

Thus, the project has the Neuroimaging Research Group, headed by Dr. Juan Domingo Gispert; the Clinical Research and Risk Factors for Neurodegenerative Diseases Group, led by Dr. Oriol Grau-Rivera; and the new Research Group on Biomarkers in Fluids and Translational Neurology, led by Dr. Marc Suárez-Calvet; and the Genomics Research Group, led by Dr. Arcadi Navarro.

2.03

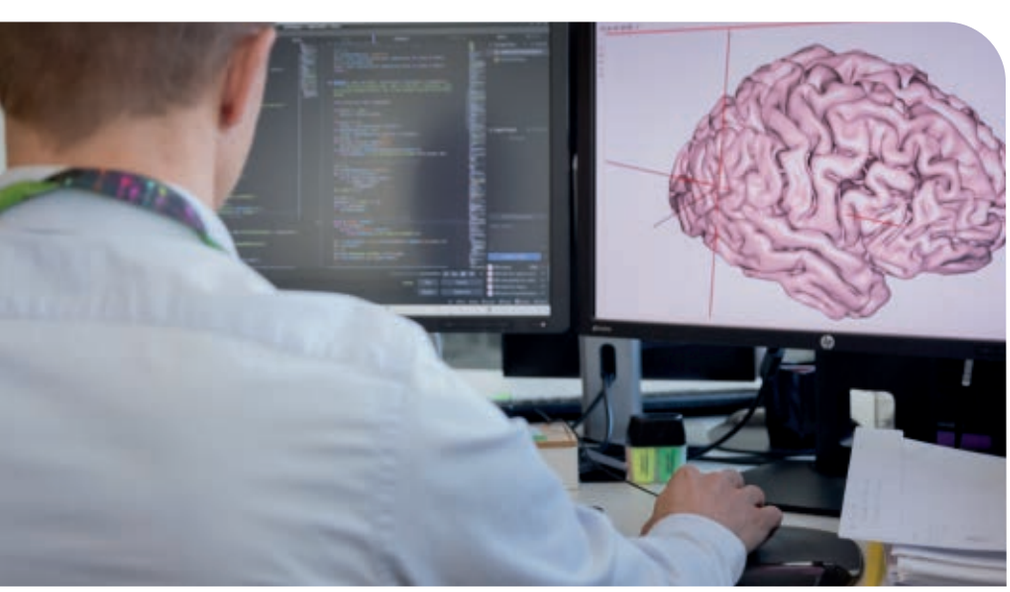
The main objective of the research is to be able to detect Alzheimer's early and design prevention programs that delay or stop the appearance of its symptoms.

Neuroimaging Research Group

The Neuroimaging Research Group studies the characteristics associated with healthy aging and risk factors for Alzheimer's disease through brain images obtained by magnetic resonance imaging and positron emission tomography (PET). The researchers analyze the information obtained through neuroimaging techniques together with cognitive, genetic, environmental factors, clinical history, lifestyle habits and biomarkers associated with the disease.

In this way, they can detect its impact on the brain at a structural, functional and molecular level, as well as open the door to the development of new disease prevention strategies.

The group, led by Dr. Juan Domingo Gispert, is made up of a multidisciplinary team of experts in the acquisition, processing and analysis of complex neuroimaging data. In 2021 it actively participated in the European EPAD and AMYPAD collaborative investigations; with institutions such as the Cardiovascular Research Center (CNIC) and the Polytechnic University of Barcelona (UPC) and the European organization EIT Digital, among others.



Lines of research

Correlations between brain structure and risk factors for Alzheimer's in the preclinical phase of the disease.

Improving the use of amyloid PET imaging in clinical and research settings.

Genetic determinants of brain phenotypes.

New detection techniques for the preclinical phase of Alzheimer's disease.

Generation of a repository of images of the preclinical phase of Alzheimer's disease.

2.03

The group is made up of a multidisciplinary team that includes experts in clinical neurology, neurophysiology and neuropsychology.

Clinical Research Group and Risk Factors for Neurodegenerative Diseases

The Clinical Research and Risk Factors for Neurodegenerative Diseases Group is aimed at understanding the biological and clinical changes that precede the cognitive deterioration caused by Alzheimer's disease.

Likewise, it studies how different elements such as sleep, dietary patterns or cardiovascular risk factors interact with brain structure and function, and with the biomarkers of Alzheimer's disease.

The group is made up of a multidisciplinary team that includes experts in clinical neurology, neurophysiology and neuropsychology, led by Dr. Oriol Grau since 2021.

The members of the group collaborate on multiple projects of the Alzheimer's Association, the EPAD consortium, the Barcelona Global Health Institute (ISGlobal), the Hospital del Mar Medical Research Institute (IMIM) and the August Pi i Sunyer Biomedical Research Institute (IDIBAPS), among others.

Lines of research

Association between sleep disturbances, cognitive impairment and Alzheimer's.

Characterization of subtle cognitive changes in the preclinical phase of Alzheimer's.

Effects of specific nutrients and dietary patterns on the development of Alzheimer's.

Study of the personalized risk of developing dementia to offer personalized prevention plans.

2.03

Biomarkers in Fluids and Translational Neurology Research Group

The objective is to develop biomarkers, discover new therapeutic targets and provide a better understanding of the molecular mechanisms of Alzheimer's and other neurodegenerative diseases.

The objective of the Fluid Biomarkers and Translational Neurology Research Group, established in 2021, is to develop biomarkers, discover new therapeutic targets and provide a better understanding of the molecular mechanisms of Alzheimer's and other neurodegenerative diseases through translational research.

The group is led by Dr. Marc Suárez-Calvet, beneficiary of the prestigious ERC Starting Grant, endowed with 1.5 million euros and aimed at studying the mechanisms of aging, the main risk factor in Alzheimer's disease.

The group collaborates with the University of Göteborg, the Hospital del Mar Medical Research Institute (IMIM), Avid Radiopharmaceuticals and Roche Diagnostics International, among others.

Lines of research

Development, validation and application of new biomarkers that improve the diagnosis of Alzheimer's or other neurodegenerative diseases in their earliest stages.

Execution of the HeBe project, focused on identifying blood factors that have a rejuvenating or aging effect on the brain and that can become therapeutic targets for Alzheimer's disease.

2.03

Genomics Research Group

The Genomics Research Group, led by Dr. Arcadi Navarro, was created in 2021 with the aim of studying the causes of aging and age-related diseases, particularly neurodegenerative disorders, from a genetic perspective.

The objective is to study the causes of aging and age-related diseases.

It maintains collaborations with Pompeu Fabra University (UPF), the University of Barcelona (UB), Harvard University, Göteborg University, IrsiCaixa, European Molecular Biology Laboratory (EBI-EMBL) and the Higher Council for Scientific Research (CSIC), among others.

Lines of research

Analysis of the genetic relationships (pleiotropies) between different diseases, especially those associated with age, using bioinformatic tools for the study of large international databases of biomedical information.

Creation of a genetic basis for neurodegenerative and psychiatric diseases, mainly using genomic data from the Alfa Study.

Study of the neurological effects of Covid-19 in people with different risk of Alzheimer's through mini-brains, personalized human brain organoids.

2.04

Research projects

The HeBe project receives funding from the European Research Council within the framework of the European Union's Horizon 2020 research and innovation programme.

HeBe

HeBe is a research project that began in 2021, led by Dr. Marc Suárez-Calvet, under the umbrella of the prestigious **European ERC Starting Grant**. HeBe, named after the Greek goddess of eternal youth, has an expected life of 5 years.

Although we know that aging is the main risk factor for the development of Alzheimer's and other neurodegenerative diseases, the mechanisms behind this association are still unknown. The main objective of HeBe is to investigate these mechanisms by identifying brain rejuvenation factors in blood to use them as therapeutic targets for Alzheimer's disease.

To identify these blood factors, researchers will determine the biological age of the Alfa Study participants, and look for blood factors that differ among participants with extreme biological ages; that is, participants with much younger biological ages versus those with much older biological ages than their chronological ages. HeBe's main hypothesis is that there are factors in the blood that explain the differences between biological and chronological age.

Study on the impact of home confinement during the Covid-19 pandemic on the brain and mental health

In 2020, a new study was launched to analyze the effects of confinement derived from the Covid-19 pandemic on mental and brain health, as well as other factors that mitigate its impact. The project has more than **900 cognitively healthy participants**, between 45 and 75 years old, who are or have been part of different BBRC studies.

The participants answered a series of online questionnaires during the lockdown and returned to do so some 18-24 months later so that the researchers can assess the results related to anxiety, depression and post-traumatic stress.

The objective of the study is to detect brain changes related to Alzheimer's disease and study the impact of confinement on people who care for a family member with dementia or other diseases that involve dependency or special needs.

2.04

Alfa Sleep

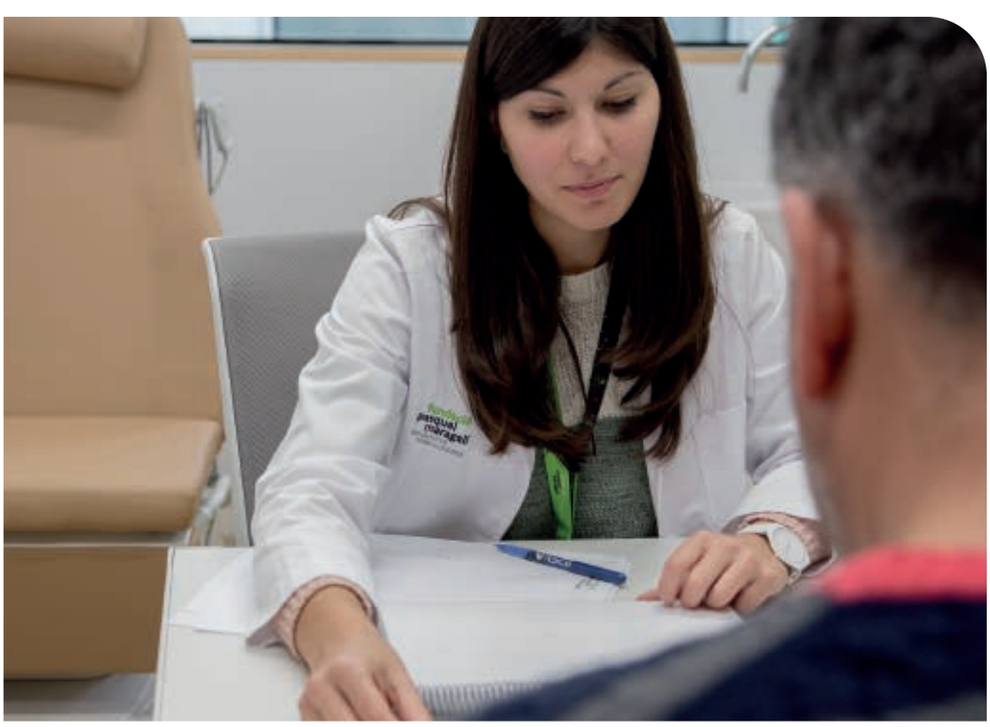
Alfa Sleep is a new study that will delve into the relationship between insomnia and Alzheimer's. The project, with an expected duration of 2 years, began visits in 2021.

In the **127 visits** that were carried out this year, tests such as polysomnography, actigraphy and analysis of the levels of the neuropeptide orexin, key in the regulation of sleep, were carried out. The data obtained from the nearly **200 participants**, together with that of the Alfa + study, allow us to extract very precise and reliable information to study the association between different sleep parameters, biochemical changes and changes in brain structure and functionality.

Alfa Sleep is funded by the Alzheimer's Association and the Carlos III Health Institute.

alzheimer's association

Instituto de Salud Carlos III



Alfa+ Study

Alfa+ is a prospective, observational cohort study that aims to describe the biological processes and identify factors that may precede the preclinical phase of Alzheimer's disease.

Thanks to the extensive characterization of its participants, from the Alfa Study, Alfa+ analyzes the association between biological, structural, functional and neurocognitive brain markers that characterize the preclinical phase of the disease and its natural history.

Some **420 people** without cognitive impairment participate in the study, who undergo different tests every three years, such as cognitive tests, cerebrospinal fluid extraction by lumbar puncture, nursing tests and two MRIs. Participants are also invited to undergo a PET scan at the Hospital Clínic facilities. In 2021, **630 visits** of this study were carried out at the BBRC facilities.

2.04

About 200 people participate in the study, who undergo neurological tests, neuroimaging tests, cognitive tests and life habits, and a blood draw.

Alfa Cognition

Alfa Cognition is an observational and prospective study that analyzes the relationship between the subjective perception of cognitive decline and the presence, evolution or risk of clinically objective cognitive decline. It also analyzes the relationship between these parameters and brain changes associated with Alzheimer's disease.

About **200 people** participate in the study, who undergo neurological tests, neuroimaging tests, cognitive tests and life habits, and a blood draw. In 2021, **127 visits** were made for this study.

Clinical Research Unit in Prevention of Dementia

The **Dementia Prevention Clinical Research Unit** is a study carried out between 2018 and 2021 that has studied the risk and biological bases of developing dementia five years from now, in addition to offering participants a personalized action plan to try to reduce their risk.

The study has incorporated more than **300 participants** between the ages of 60 and 80 who experience a decline in their cognitive abilities. In 2021 the last **134 visits** were made.

While waiting to be able to analyze and interpret all the data, the intermediate analysis of results demonstrates the **success of the selection of participants using algorithms and of the online registration method** for the recruitment of people with these characteristics. The study also highlights the **value of personalized clinical structures**, since more than half of the participants in the Research Unit were able to be offered other clinical studies from which they could benefit.

2.04

The PENSA Study is part of the World Wide FINGERS international consortium, an initiative dedicated to promoting primary prevention projects for cognitive decline and dementia.

The project is funded with a million dollars by the Alzheimer's Association of the United States.

PENSA Study

The **PENSA study** aims to determine if it is possible to stop cognitive deterioration in stages prior to the onset of dementia through the promotion of healthy lifestyles and the intake of epigallocatechin gallate (EGCG), a natural component of green tea.

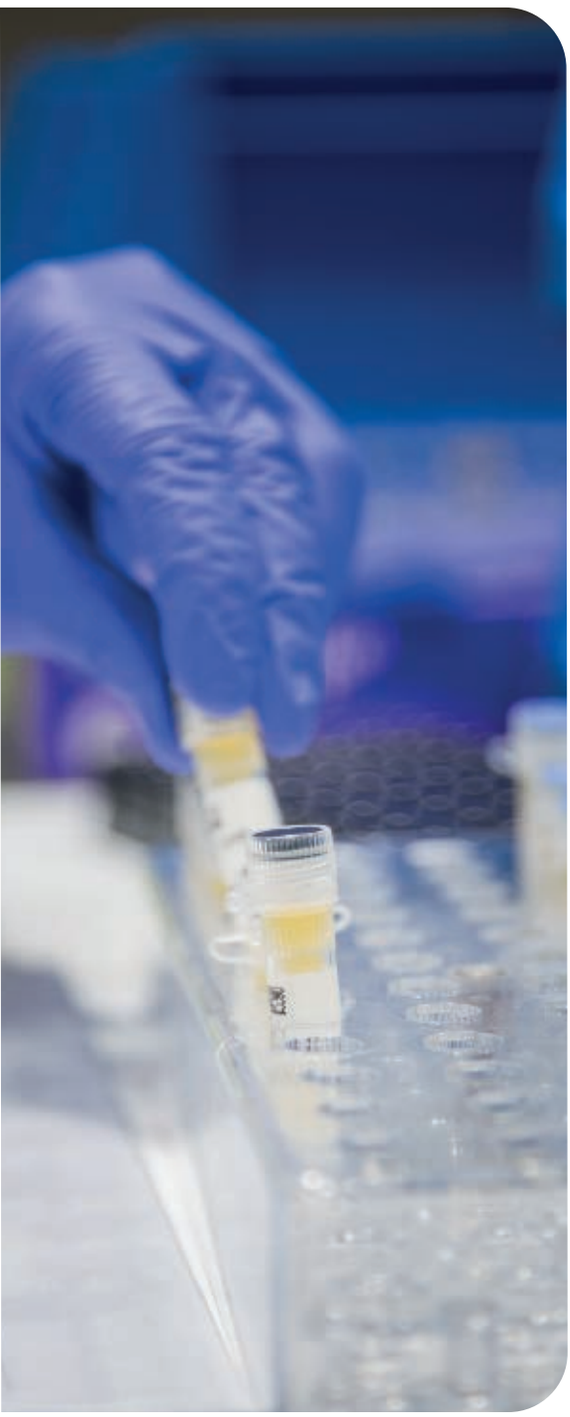
To do this, the study offers participants a **personalized action plan** based on lifestyle habits and health indicators.

The project is led by the BBRC and the Hospital del Mar Medical Research Institute (IMIM), and was launched in December 2019 with an expected duration of 17 months. In 2021, a total of **105 participants** were recruited and 101 visits were made.

The participants are people between 60 and 80 years old who are experiencing a decline in memory or other cognitive abilities such as attention, planning ability or orientation, among others.

105
Participants

2.04



Beta-AARC Study

The Beta-AARC study project: **Cohort study for the identification of blood biomarkers in the population with subjective cognitive decline** has the objective of knowing the factors that intervene in the beginning of the biological process of Alzheimer's disease and the biomarkers that predict its evolution.

The study will include **200 participants** between the ages of 55 and 80 who experience a subjective decline in memory or other cognitive abilities, such as attention, planning ability and orientation. Since May 2021, **212 participants** have been screened, who will undergo clinical, cognitive, imaging tests and determinations of biomarkers in blood and cerebrospinal fluid.

The project has the objective of knowing the factors that intervene in the beginning of the biological process of Alzheimer's disease.

Tau PET Study

The main objective of the **tau PET** study is to characterize the distribution of the neurofibrillary tangles of the tau protein by means of PET based on the levels of amyloid protein, transversally and longitudinally.

The tau protein is, together with the amyloid protein, one of the markers of the pathophysiology of Alzheimer's disease. Therefore, the tau PET study allows us, in combination with the Alfa PET study and AMYPAD, to characterize the brain distribution of the two hallmarks of Alzheimer's disease: amyloid and tau proteins.

2.04

The objective of this project is to use this technology as a screening tool for clinical trials for Alzheimer's disease, before applying the current invasive and expensive techniques.

Artificial intelligence algorithms from resonance

The Neuroimaging Research Group of the BBRC has developed a set of machine learning algorithms capable of predicting the presence of abnormal levels of Alzheimer's disease biomarkers in the brain of individuals without cognitive alterations, through the analysis of data derived from MRI.

The objective of this project is to use this technology as a screening tool for clinical trials for Alzheimer's disease, before applying the current invasive and expensive techniques. In the short term, the use of this technology will avoid 63% of unnecessary cerebrospinal fluid and PET procedures, associated with a 40% reduction in costs.

In the long term, the solution will bring us closer to effective preventive therapy for Alzheimer's disease, which now costs €32,000 per patient per year.

This project has received funding from CaixaImpulse, promoted by the "la Caixa" Foundation, and from the EIT Digital Health Call, with the support of the European Institute of Innovation and Technology (EIT), an organisation of the European Union.

In 2021 the BBRC created BetaScreen, the first spin-off of the Pasqual Maragall Foundation.

It is a technological company in which the research project on artificial intelligence algorithms developed over five years at the BBRC culminates.

Betascreen's technology, applied to people participating in Alzheimer's clinical trials in MRIs, will make possible to identify which people really needs standard tests and in which cases they can be avoided.

2.05 International consortia

Blood tests to detect amyloid pathology

Researchers from the University of Göteborg, Lund University, Roche Diagnostics International and the BBRC collaborate on the project ***Fully automated plasma assays as screening tests for Alzheimer-related amyloid beta (Aβ) pathology***.

Its objective is to develop a detection and triage algorithm based on blood biomarker analysis to detect amyloid pathology.

The new system will be designed so that, in the future, it can be implemented in primary care centers to identify people with cerebral amyloid pathology. Their method will be tested in participants from BBRC cohort studies, the Swedish BIOFINDER cohort, and 15 care centers in Sweden.

The project is funded by the Alzheimer's Drug Discovery Foundation.

TRIBEKA

TRIBEKA is an initiative of the BBRC and the University of Edinburgh, promoted to identify brain alterations prior to the onset of symptoms of Alzheimer's disease and other neurodegenerative diseases.

The platform has made available to the scientific community a neuroimaging database with widely characterized information on healthy middle-aged people, with the aim of advancing in the design of treatments against the disease.

The information is accessible through the website of the *Global Alzheimer's Association Interactive Network (GAAIN)*.

TRIBEKA is funded by the Alzheimer's Association and an international anonymous charitable foundation.

2.05

AMYPAD

The **Amyloid Imaging to Prevent Alzheimer's Disease** project is a European collaboration to improve understanding, diagnosis and treatment of Alzheimer's through the use of brain amyloid PET. The consortium is made up of 17 European institutions, including the BBRC and other research centres, industry and associations of people and families with Alzheimer's.

The AMYPAD diagnostic study aims to determine the value of amyloid PET as a diagnostic and therapeutic marker for Alzheimer's. 844 people from all over Europe participate in this study, of which 101 are BBRC participants.

On the other hand, the consortium is also carrying out a prognosis study to better understand the natural history of the disease, which has 754 participants, of which 176 are from the BBRC. Overall, in 2021, 107 diagnostic study visits and 234 prognostic study visits were carried out in Barcelona.

More information:
https://amypad.eu/

AMYPAD is funded by grant number 115952 from Program 2 of the Innovative Medicines Initiative, which is a joint initiative of the European Commission's Horizon 2020 research and innovation program and the European Federation of Pharmaceutical Industries and Associations (EFPIA).

EU-FINGERS

The BBRC is a partner of the ***EURO-FINGERS project: multimodal precision prevention toolbox for dementia in Alzheimer's disease***. This initiative aims to generate prevention tools for Alzheimer's disease and other dementias, and seeks to provide a common framework for multimodal studies on the prevention of Alzheimer's dementia.

In 2021, a BBRC research participant participated in the EU-FINGERS advisory committee to provide advice and recommendations to researchers and enrich research with a diversity of voices and perspectives.

2.06 Clinical trials

AB1601

The main objective of AB1601, led by the Grífols pharmaceutical company **Araclon Biotech**, is to evaluate the efficacy, safety, tolerability and immune response of the drug ABvac40 in people between 55 and 80 years of age with amnestic mild cognitive impairment or in very early stages of the disease. The 200 study participants will undergo tests such as PET, brain magnetic resonance imaging and cognitive tests, among others, in mainly Spanish centers, but also in France, Italy and Sweden.

The 200 study participants will undergo tests such as PET, brain magnetic resonance imaging and cognitive tests

200
Participants

2.07 Publications

In 2021, BBRC researchers published 71 articles, mainly in scientific journals of reference in the field of Alzheimer's and neurodegenerative diseases.

Most outstanding publicationss

• Salvadó G, Ferreira D, Operto G, Cumplido-Mayoral I, Arenaza-Urquijo EM, Cacciaglia R, Falcon C, Vilor-Tejedor N, Minguillon C, Groot C, van der Flier WM, Barkhof F, Scheltens P, Ossenkoppele R, Kern S, Zettergren A, Skoog I, Hort J, Stomrud E, van Westen D, Hansson O, Molinuevo JL, Wahlund LO, Westman E, Gispert JD; ALFA study†, BioFINDER, ADNI. **The protective gene dose effect of the APOE ε2 allele on gray matter volume in cognitively unimpaired individuals**. Alzheimers Dement. 2021 Dec 8. doi: 10.1002/alz.12487. Epub ahead of print. PMID: 34877786.

• Benedet AL, Milà-Alomà M, Vrillon A, Ashton NJ, Pascoal TA, Lussier F, Karikari TK, Hourregue C, Cognat E, Dumurgier J, Stevenson J, Rahmouni N, Pallen V, Poltronetti NM, Salvadó G, Shekari M, Operto G, Gispert JD, Minguillon C, Fauria K, Kollmorgen G, Suridjan I, Zimmer ER, Zetterberg H, Molinuevo JL, Paquet C, Rosa-Neto P, Blennow K, Suárez-Calvet M. **Translational Biomarkers in Aging and Dementia (TRIAD) study, Alzheimer's and Families (ALFA) study, and BioCogBank Paris Lariboisière cohort. Differences Between Plasma and Cerebrospinal Fluid Glial Fibrillary Acidic Protein Levels Across the Alzheimer Disease Continuum**. JAMA Neurol. 2021 Dec 1;78(12):1471-1483.

• Milà-Alomà M, Brinkmalm A, Ashton NJ, Kvartsberg H, Shekari M, Operto G, Salvadó G, Falcon C, Gispert JD, Vilor-Tejedor N, Arenaza-Urquijo EM, Grau-Rivera O, Sala-Vila A, Sanchez-Benavides G, González de Echávarri JM, Minguillon C, Fauria K, Niñerola-Baizán A, Perissinotti A, Kollmorgen G, Suridjan I, Zetterberg H, Molinuevo JL, Blennow K, Suárez- Calvet M; ALFA Study. **CSF Synaptic Biomarkers in the Preclinical Stage of Alzheimer Disease and Their Association With MRI and PET: A Cross-sectional Study**. Neurology. 2021 Nov 23;97(21):e2065-e2078.

• Alemany S, Crous-Bou M, Vilor-Tejedor N, Milà-Alomà M, Suárez-Calvet M, Salvadó G, Cirach M, Arenaza-Urquijo EM, Sanchez-Benavides G, Grau-Rivera O, Minguillon C, Fauria K, Kollmorgen G, Domingo Gispert J, Gascón M, Nieuwenhuijsen M, Zetterberg H, Blennow K, Sunyer J, Luis Molinuevo J; ALFA study. **Associations between air pollution and biomarkers of Alzheimer's disease in cognitively unimpaired individuals**. Environ Int. 2021 Sep 16;157:106864.

• Vilor-Tejedor N, Ciampa I, Operto G, Falcón C, Suárez-Calvet M, Crous-Bou M, Shekari M, Arenaza-Urquijo EM, Milà-Alomà M, Grau-Rivera O, Minguillon C, Kollmorgen G, Zetterberg H, Blennow K, Guigo R, Molinuevo JL, Gispert JD; ALFA study. **Perivascular spaces are associated with tau pathophysiology and synaptic dysfunction in early Alzheimer's continuum**. Alzheimers Res Ther. 2021 Aug 5;13(1):135.

2.07

71
Articles

87%
Q1

78%
D1

• Sánchez-Benavides G, Suárez-Calvet M, Milà-Alomà M, Arenaza-Urquijo EM, Grau-Rivera O, Operto G, Gispert JD, Vilor-Tejedor N, Sala-Vila A, Crous-Bou M, González-de-Echávarri JM, Minguillon C, Fauria K, Simon M, Kollmorgen G, Zetterberg H, Blennow K, Molinuevo JL; ALFA Study. **Amyloid-β positive individuals with subjective cognitive decline present increased CSF neurofilament light levels that relate to lower hippocampal volume**. Neurobiol Aging. 2021 Mar 6;104:24-31.

• Salvadó G, Milà-Alomà M, Shekari M, Minguillon C, Fauria K, Niñerola-Baizán A, Perissinotti A, Kollmorgen G, Buckley C, Farrar G, Zetterberg H, Blennow K, Suárez-Calvet M, Molinuevo JL, Gispert JD; ALFA study. **Cerebral amyloid-β load is associated with neurodegeneration and gliosis: Mediation by p-tau and interactions with risk factors early in the Alzheimer's continuum**. Alzheimers Dement. 2021 May;17(5):788-800.

• Sala-Vila A, Arenaza-Urquijo EM, Sánchez-Benavides G, Suárez-Calvet M, Milà-Alomà M, Grau-Rivera O, González-de-Echávarri JM, Crous-Bou M, Minguillón C, Fauria K, Operto G, Falcón C, Salvadó G, Cacciaglia R, Ingala S, Barkhof F, Schröder H, Scarmeas N, Gispert JD, Molinuevo JL; ALFA study. **DHA intake relates to better cerebrovascular and neurodegeneration neuroimaging phenotypes in middle-aged adults at increased genetic risk of Alzheimer disease**. Am J Clin Nutr. 2021 Jun 1;113(6):1627-1635.

• Collij LE, Salvadó G, Shekari M, Alves IL, Reimand J, Wink AM, Zwan M, Niñerola-Baizán A, Perissinotti A, Scheltens P, Ikonomovic MD, Smith APL, Farrar G, Molinuevo JL, Barkhof F, Buckley CJ, van Berckel BNM, Gispert JD; ALFA study; AMYPAD consortium. **Visual assessment of [^{18}F]flutemetamol PET images can detect early amyloid pathology and grade its extent**. Eur J Nucl Med Mol Imaging. 2021 Jul;48(7):2169-2182.

• Grau-Rivera O, Navalpotro-Gomez I, Sánchez-Benavides G, Suárez-Calvet M, Milà-Alomà M, Arenaza-Urquijo EM, Salvadó G, Sala-Vila A, Shekari M, González-de-Echávarri JM, Minguillón C, Niñerola-Baizán A, Perissinotti A, Simon M, Kollmorgen G, Zetterberg H, Blennow K, Gispert JD, Molinuevo JL; ALFA Study. **Association of weight change with cerebrospinal fluid biomarkers and amyloid positron emission tomography in preclinical Alzheimer's disease**. Alzheimers Res Ther. 2021 Feb 17;13(1):46.

2.08 Dissemination of the results

Early association between cardiovascular risk and brain metabolism

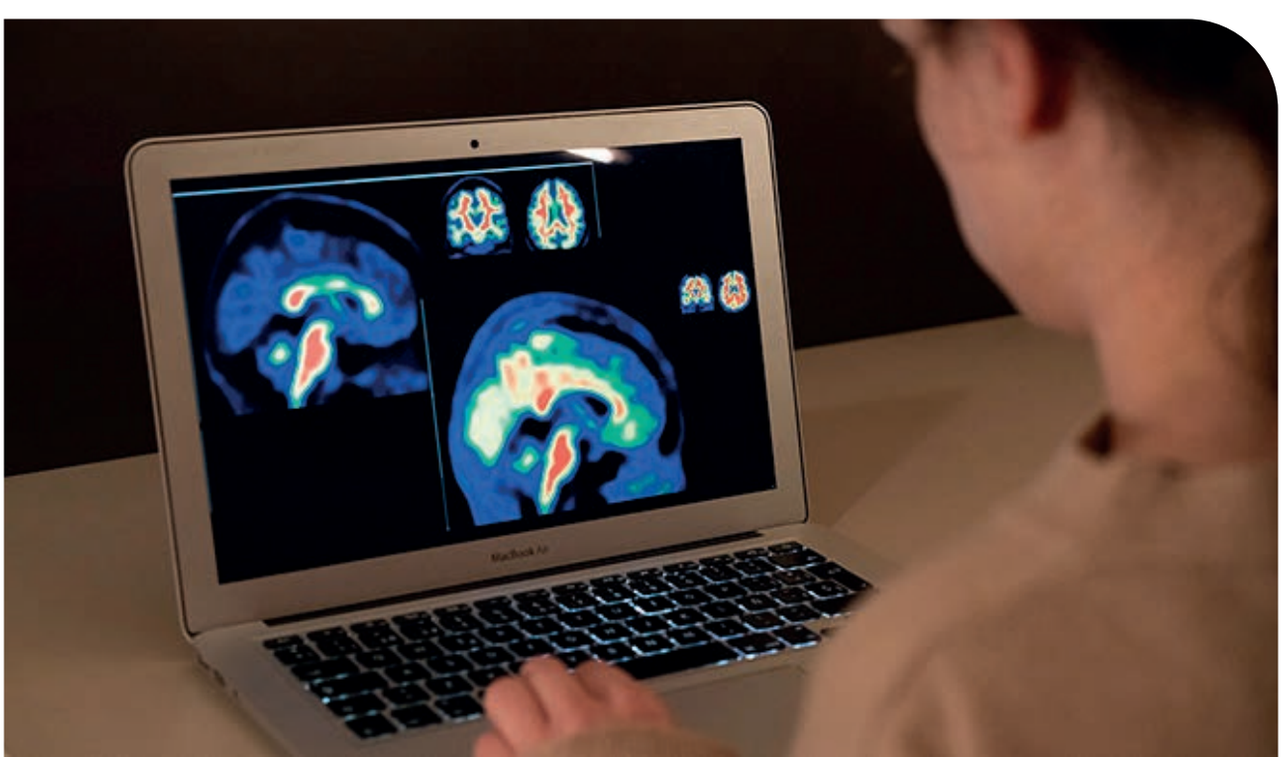
In January 2021, we published the results of a study carried out together with the National Center for Cardiovascular Research (CNIC) which indicates that the relationship between cardiovascular disease and factors of cognitive impairment occurs many years before the first clinical symptoms of either of the two pathologies appear.

The finding opens the possibility of intervening on a modifiable disorder, such as cardiovascular diseases, to prevent the evolution of a pathology for which there is no treatment, such as dementia.

Improvement in the sensitivity of the diagnosis of the initial phases of Alzheimer's

In February 2021, in the context of the AMYPAD international consortium, we determine that the method used to diagnose Alzheimer's with amyloid PET is also capable of detecting the most incipient phases of the disease.

The work, which has had the participation of 352 people from the Alfa Study cohort, provides a method that is easily applicable in clinical practice that will allow a more sensitive diagnosis.



2.08

New benefits of oily fish consumption in people at risk of developing Alzheimer's disease

In April 2021, we detect that people carrying the APOE ε4 / 4 genotype, linked to a higher risk of Alzheimer's, have more cortical preservation in areas of the brain specifically affected in Alzheimer's disease and a lower number of microbleeds if they consume more Docosahexaenoic acid (DHA), a nutrient provided by oily fish.

The study, carried out with a sample of 340 participants from the Alfa Study, puts on the table the possibility of improving the design of dietary interventions with DHA supplementation.

Weight loss could be an indicator of a higher risk of developing Alzheimer's disease

In June 2021, we announce research results suggesting that people at increased risk of developing Alzheimer's show weight loss that could predict cognitive decline from the disease.

This finding presents the possibility of improving the accuracy of Alzheimer's risk indices by including an indicator of changes in body weight. The study included the participation of 408 people without cognitive alterations from the Alfa+ Study.

2.08

New biomarker that allows very precise detection of the initial phases of Alzheimer's disease

In October 2021, we identified glial fibrillary acidic protein (GFAP) as a highly accurate biomarker to diagnose the early stages of Alzheimer's disease in the blood. The result of this research will improve the diagnostic precision of the preclinical phase of Alzheimer's through a blood test, combining the detection of the GFAP biomarker with others recently discovered.

The study was carried out on 900 participants, from three cohorts dedicated to research in Alzheimer's prevention; 387 linked to the Alfa Study.

Music related to life experiences activates parts of the brain other than those involved in the natural process of remembering

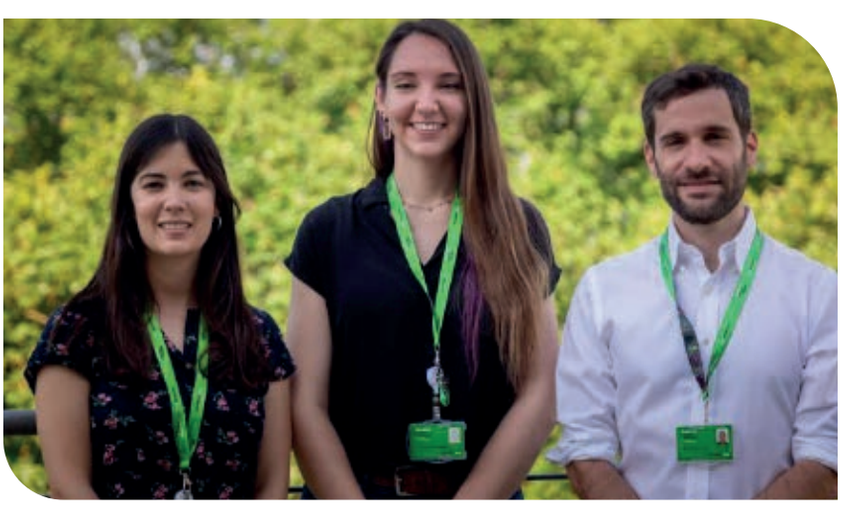
On November 22, International Music Day, we publish the results of a study that analyses how some songs linked to personal experiences from the past would activate parts of the brain different from those involved in the natural process of remembering.

This line of research, still in a preliminary phase, could pave the way for the study of how music can make some memories, which would otherwise be lost, persist.

Increased nitrogen dioxide exposure linked to higher levels of Alzheimer's disease biomarkers in the brain

In December 2021, we found that exposure to air pollution may be associated with higher levels of biomarkers of Alzheimer's disease, especially in people with beta-amyloid accumulation in the brain.

The research reinforces the emerging scientific evidence that air pollution could be a risk factor in the development of Alzheimer's. The study sample included 156 people without cognitive alterations with a mean age of 57 years from the Alfa Study.



2.09 Scholarships and competitive aid

The BBRC obtained in 2021 a total of 9 grants to carry out scientific projects. Obtaining these funds endorses the rigor, excellence, competitiveness and innovative nature of the center's research, and allows us to advance in the prevention of Alzheimer's disease.

List of grants awarded:

Postdoctoral Junior Leader Retaining.
”la Caixa” Foundation
Dr. Marc Suárez-Calvet

Within the framework of the INPhINIT doctoral scholarship programme, the ”la Caixa” Foundation awarded one of the 45 scholarships to excellent researchers in the Junior Leader postdoctoral program to Dr. Marc Suárez-Calvet, a neurologist, researcher and head of the Research Team at Biomarkers in Fluids and Translational Neurology of the BBRC.

The grant has a duration of 3 years and includes a complementary training program that aims to consolidate research skills and promote a scientific career.

▸ Dr. Marc Suárez-Calvet.

2.09

Obtaining these funds endorses the rigor, excellence, competitiveness and innovative nature of the center's research.

9
Grants

Aid for pre-doctoral contracts for doctoral training 2020.
State Research Agency
Dra. Eider M. Arenaza-Urquijo

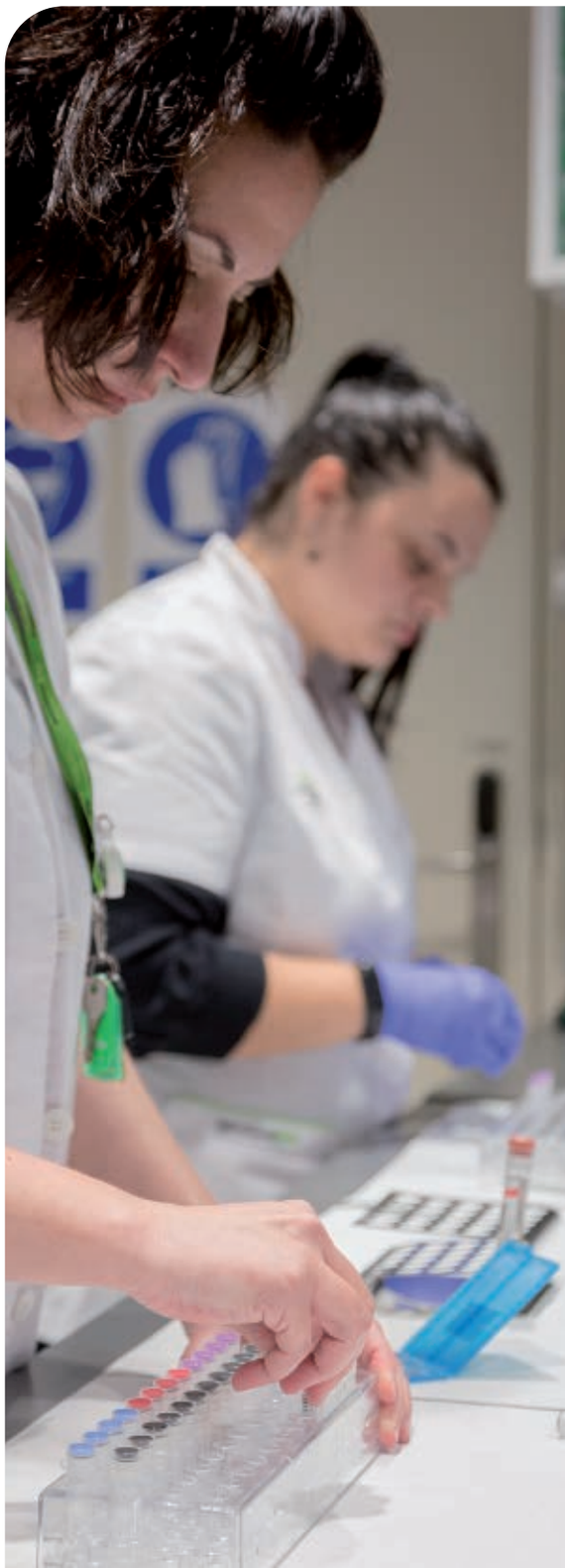
RAPID Program.
Alzheimer's Association
Dra. Eider M. Arenaza-Urquijo
Dra. Marta Crous-Bou

Projects Challenges of Society (A).
State Research Agency
Dr. Gonzalo Sánchez-Benavides

Juan de la Cierva Incorporation.
State Research Agency
Dr. Oriol Grau
Dra. Natàlia Vilor-Tejedor

Marató TV3 2020: Covid-19.
Marató TV3
Dr. Arcadi Navarro

Multidisciplinary Research Projects on Personalised Medicine - Development of Clinical Support Tools for Personalised Medicine Implementation.
ERA PerMed
Dr. Marc Suárez-Calvet



2.10 Congresses

Throughout the year, our research staff participated in different conferences and congresses dedicated to Alzheimer's, most of them still held online due to the Covid-19 pandemic.

January, 22

Online
Participation of Raffaele Cacciaglia and Gemma Salvadó in the Massachusetts General Hospital's Multicultural Alzheimer's Prevention Program (MAPP) ApoE Symposium.

From January 27 to 29

Online
Participation of Patricia Genius and Blanca Rodríguez-Fernández in the 5th Student Scientific Conference organized by the Spanish Biostatistics Society (SEB).

From March 9 to 15

En línea
Participation of Gemma Salvadó in the International Congress on Alzheimer's and Parkinson's (AD/PD).

March, 15

Online
Participation of Eider Arenaza-Urquijo in the webinar 'Resilience against Alzheimer's disease dementia: Do sex/gender and racial/ethnic differences matter?' organized by The Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART).

May, 5

Online
Participation of Eider Arenaza-Urquijo in the webinar 'Resistance against AD pathologies: The role of sleep, exercise, and stress management' organized by The Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART).

June, 1

Online
Participation of Marc Suárez-Calvet and Marta Milà-Alomà in the webinar 'Methods Club: Biofluid Biomarkers Edition' organized by The Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART).

June, 21

Online
Participation of Natàlia Vilor-Tejador in the annual meeting of the Organization for Human Brain Mapping (OHBM).

2.10

From November 29 to December 2

Boston (United States)

Participation of Juan Domingo Gispert and Anna Brugulat in the annual conference of Clinical Trials on Alzheimer's Disease (CTAD).

From December 9 to 10

Granada (Spain)

Participation of Juan Domingo Gispert in the international congress "Promoting brain health through exercise across the lifespan".

▸ Researcher Juan Domingo Gispert at the annual conference Clinical Trials on Alzheimer's Disease (CTAD).

Alzheimer's Association Congress 2021.

The BBRC research team had, once again, an outstanding participation in the Alzheimer's Association International Conference (AAIC).

In 2021, an outstanding communication was presented related to the study of the impact of confinement on mental health, five oral presentations and 15 scientific posters, among others.

The benchmark conference for Alzheimer's research was held for the first time in part in a hybrid format, from July 26 to 30, 2021, online and in Denver, United States.

trans forma tion.

We seek solutions and explore new paths to create relevant results.

At the Pasqual Maragall Foundation we work to change the social consideration of affected people and caregivers. With this objective, we support families living with Alzheimer's disease through group programs for caregivers. Since the start of the covid-19 crisis, the project has been carried out online, with the aim of continuing to offer caregivers emotional support and tools to manage their day-to-day lives.

With the learning and new dynamics arising from the pandemic, the new program "Learn to take care of yourself" was launched, in virtual format and dedicated to providing training and support to caregivers of people with Alzheimer's. Likewise, we carry out dissemination and awareness actions, offering talks, training and other actions.

03.

3.01 Group programs for caregivers

Since the beginning of the program in 2013, 1,346 caregivers have participated in the 143 free therapeutic groups that have been held in centers throughout Spain.

In 2021, the therapeutic group program created **18 new groups** with the participation of **157 caregivers** of people with Alzheimer's in Barcelona, Lleida, Tenerife, Alcalá de Henares, Madrid, Vigo and Castellón. In addition, 5 accompaniment groups were organized for relatives of Alzheimer's in Alcalá de Henares, Tenerife, Vigo and Castellón.

The program had the subsidy granted by the Ministry of Health, Social Services and Equality charged to the personal income tax allocation, from the support of the Department of Social Rights of the Generalitat of Catalonia charged to the allocation of 0.7% of personal income tax. and financing by the Barcelona City Council, Caixabank, Santalucía, Fundación Adey and Agbar.

In collaboration with the La Caixa Foundation, the university extension course accredited by the Continuing Education Institute of the University of Barcelona "Conduction of therapeutic groups and advice to family caregivers of people with Alzheimer's disease" has been offered, in which 89 professionals have participated . This course, dedicated to professionals with a university degree, offers resources and training tools to guide and accompany families in the most appropriate way possible.

143
Therapeutics groups since 2013

1,346
Caregivers and participants

3.01

The goal of group programs is to provide caregivers with the information and tools they need to understand and accept Alzheimer's disease.

The sessions aim to improve the quality of life of caregivers, which has a direct impact on the quality of care they provide and the well-being of the people with Alzheimer's under their care.

Program "Learn to take care and take care of yourself"

Taking advantage of the learning and the new dynamics arising from the pandemic, at the end of September, the Pasqual Maragall Foundation launched the group support and training program for non-professional caregivers of people with Alzheimer's, "Learn to take care of yourself".

The intervention was born with the aim of providing caregivers with the necessary tools to manage, with the best possible quality of life, their day-to-day life with a person with Alzheimer's, taking into account both their own well-being and that of the people who they care for.

In this new program, which was promoted by the Generalitat de Catalunya and the support of Ricoh, PromoFarma and Valvi supermarkets, 12 groups were held in 2021 with 121 people participating.

Con el apoyo de:

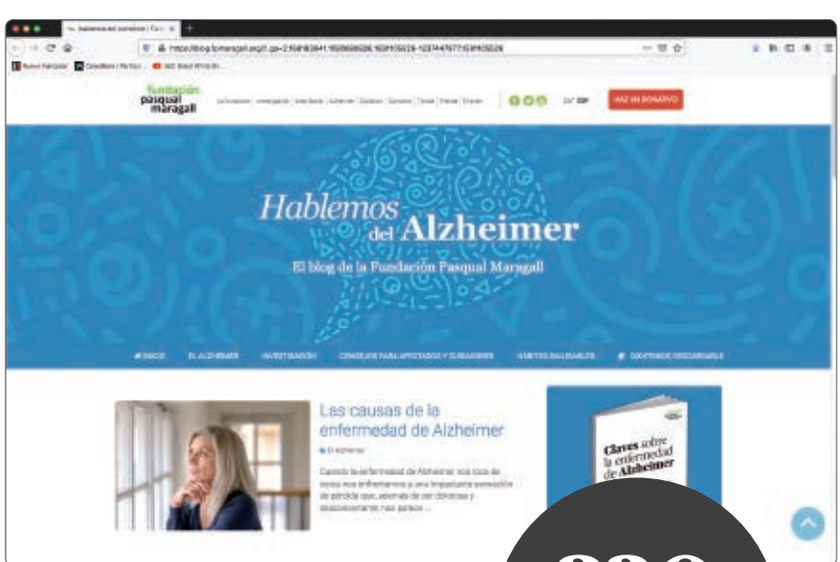
3.02 Awareness and outreach activities

2.3 millions visits

Blog "Let's talk about Alzheimer's"

The Pasqual Maragall Foundation wants to answer the questions about Alzheimer's that may be raised by affected people, their carers, family members and the general public. For this reason, in June 2017, we launched the blog "Let's talk about Alzheimer's", with rigorous, precise and updated information about Alzheimer's.

In 2021, 29 new articles were published, reaching a total of 230. Throughout the year, **2.3 million visits** to the blog were registered, **70% more** than in 2020.



https://blog.fpmaragall.org/

230 New articles

September 21: a day to forget

On World Alzheimer's Day, September 21, the Pasqual Maragall Foundation wanted to highlight its position regarding one of the keys to finding a cure for the disease: research.

With more than 13 years dedicated to research, through the BBRC, the Foundation has shown that in order to erase September 21, #undíaparaolvidar, from the calendar, it is necessary to become aware of how important it is to invest in research through the Comprehensive Alzheimer's Plan.

Following the line of the request of September 13 in the Congress of Deputies, the Foundation took advantage of the commemoration of the World Day to put this issue on the table.

3.02

Fourth edition of the Brain Film Fest

Between March 18 and 20, the Brain Film Fest 2021 took place, dedicated to mental health in times of pandemic and the importance of emotional and psychological well-being. The fourth edition of the festival was once again held in person at the Center for Contemporary Culture of Barcelona (CCCB) and, for the first time, it premiered an online version, with the collaboration of FILMIN and streaming broadcasts. Despite the restrictions of the pandemic, the festival reached 1,200 registrations and 5.000 Filmin visualizations.

The festival is the only international film festival dedicated to showing and promoting the creation and dissemination of short films related to any aspect of the brain. As on previous occasions, the Brain Film Fest awarded the Solé Tura Award to the best short films about the brain, in which 252 works from countries such as Spain, the United States, Moldova, Belgium or Mexico participated.

Second edition of the cycle of talks “Recuerda”

On November 4, 11 and 18, the second edition of the cycle of online talks on Alzheimer’s “Recuerda” took place.

The meetings, which had more than 1,600 people registered, are a space for debate and dissemination dedicated to the latest scientific advances in the field of prevention, as well as to offer advices and recommendations for all those people who live with the disease.

1,600
People registered

The conferences, which included professionals from the Pasqual Maragall Foundation and the BBRC, addressed topics such as the detection of Alzheimer's through a blood test, the management of uncertainty about the disease and how diet can help combat Alzheimer's.

3.02

Among the planned actions, the photographic exhibition "Protagonists of Alzheimer" stood out, which included the testimonies of 8 people directly or indirectly affected by the disease.

Campaign "Move for a future without Alzheimer's"

With the aim of raising awareness of Alzheimer's disease in the population at all levels, the Pasqual Maragall Foundation launched the campaign "Move for a future without Alzheimer's" together with the TMB Foundation.

Among the planned actions, the photographic exhibition 'Protagonists of Alzheimer' stood out, which included the testimony of 8 people directly or indirectly affected by the disease. The opening of the exhibition was attended by Cristina Maragall and Jordi Camí, president and vice president of the Foundation respectively; Gerardo Lertxundi, CEO of the TMB; Santiago Torres, the director of TMB, and Raquel Díaz, head of Social Responsibility, Women and Diversity at TMB.

"Alzheimer's Protagonists" was located in the interchange of metro lines 3 and 5 of the Diagonal station, in Barcelona, from November 8 to December 10. Throughout those days, more than 1,150,000 people passed through the location of the exhibition.

The initiative "Move for a future without Alzheimer's" came about thanks to proposals from TMB staff within the framework of the "Choose your cause" solidarity programme.

Awareness on the street

Throughout 2021, the informants of the Pasqual Maragall Foundation held conversations with 54,000 people in various parts of Spanish geography. A street contact to be able to publicise and expose the Foundation's projects to promote research into the disease.

54,000

conversations at street level

3.02

Joint demand in Congress to make Alzheimer's a political priority

Led by the Pasqual Maragall Foundation, entities and experts joined forces to ask the Congress of Deputies for a boost in research and more resources to improve the quality of life of people with Alzheimer's, their families and the people who care for them.

This demand was conveyed through the act 'The challenges of Alzheimer's and dementias', promoted by the Foundation together with the Spanish Society of Neurology (SEN), the Spanish Confederation of Alzheimer's (CEAFA), the Matia Foundation and HelpAge Spain, in the framework of World Alzheimer's Day, which is celebrated on September 21.

The act was presented by the journalist Fernando Ónega and inaugurated by the president of the Congress, Meritxell Batet. It also featured testimonials from a newly diagnosed person, two family caregivers, and a research study participant.

We give Alzheimer's a voice in the Senate

On World Health Day, April 7, Cristina Maragall, president of the Pasqual Maragall Foundation, explained the social and scientific challenge of Alzheimer's and dementia in the Talk of study about the aging process in Spain of the Senate Commission on Social Rights.

During her speech before the representatives of the different parliamentary groups, Cristina Maragall emphasized that Alzheimer's and dementia are one of the main threats to the health and well-being of the elderly, whose dimension will multiply as a result of the increase in the life expectancy of the Spaniards. Maragall denounced the lack of support for the investigation and called for sufficient and stable public funding.

3.02

Visit of the President of the Generalitat of Catalonia and of the Minister of Universities and Research

In 2021, we received the visit of Mr. Pere Aragonès, President of the Generalitat de Catalunya, and Mrs. Gemma Geis, Minister of Research and Universities of the Catalan government, who wanted to see first-hand the projects of the Pasqual Maragall Foundation and the BBRC.

In both cases, throughout their respective visits, both Aragonès and Geis were able to visit our research facilities for the early detection and prevention of Alzheimer's, and have learned about our social and outreach project.

The representatives of the Catalan government wanted to highlight the role of scientific research in finding solutions to neurodegenerative diseases such as Alzheimer's and stressed the importance of disclosure to involve society.

The representatives of the Catalan government wanted to highlight the role of scientific research in finding solutions to neurodegenerative diseases such as Alzheimer's.

Pact for Science and Innovation

From the Pasqual Maragall Foundation we join the Pact for Science and Innovation, promoted by the Ministry of Science and Innovation and signed by more than 80 organizations.

The document represents an agreement between civil society and the Government to increase resources, strengthen the role of financial agencies and attract and retain talent.

3.02

Talks, seminars and conferences

January 20, April 29, June 17 and October 14
Training for high school students on Alzheimer's by Dr. Nina Gramunt and Dr. Susana de Sola.

March, 7
Talk “Grief in the context of Alzheimer's: losses and resignations” by Dr. Sandra Poudevida and Glòria Mas.

March, 15
Presentation “Can Alzheimer's be prevented?" by Dr. Nina Gramunt at the Alzheimer Forum: "Advances in the diagnosis of the disease” organized by the Department of Experimental and Health Sciences (DCEXS) of Pompeu Fabra University with the QUAES-UPF Chair in Biomedicine and Biomedical engineering.

April, 21
“Always accompanied” training by Dr. Nina Gramunt for professionals from the ”la Caixa” Foundation.

May, 14
Talk “Can Alzheimer's be prevented?” by Dr. Nina Gramunt for the MASMÓVIL staff.

May, 18
Round table “The importance of a healthy life in disease prevention”, with the participation of Dr. Nina Gramunt, organized by Ametller Origen with the collaboration of Casa Seat.

June, 1
Training session on cognitive aging by Dr. Nina Gramunt for senior directors of Caixabank.

June, 9
Training talk “Let's talk about Alzheimer's” by Dr. Nina Gramunt in the Gent Gran d'Osona University Extension Classroom.

June, 29
Talk on the methodological protocol of Covid-19 by Dr. Nina Gramunt for the Barcelona Health Consortium.

3.02

July, 14
Talk by Dr. Sandra Poudevida about the caregiver program to the Wesser management team.

September, 15
Talk “When you take care of yourself, Alzheimer's takes a step back” at the Market of Authors of Ametller Origen by Dr. Nina Gramunt.

September, 21
Talk “Alzheimer’s: Caring for caregivers” within the framework of World Alzheimer's Day by Glòria Mas, organised by the Consell d'Eivissa.

September, 21
Talk within the framework of World Alzheimer's Day by Dr. Sandra Poudevida for the AFA of Jerez de los Caballeros.

September, 21
Talk “Alzheimer’s today” within the framework of World Alzheimer's Day by Ángeles Castillo for the AFA in Madrid.

September, 30
Webinar “Alzheimer’s: knowing it to understand it” by Dr. Nina Gramunt, organized by the General Council of Pharmacists.

September, 30
Talk “10 myths about Alzheimer 's” by Dr. Susana de Sola for Creu Roja Balears.

October, 20
Conference on legal advice in Alzheimer's disease “With prevention, better”, organized by the Notary College of the Basque Country.

November, 4
Cineforum of the film *Vivir dos veces (Living twice)* with the participation of Dr. Sandra Poudevida, within the framework of the project CulturaMent.

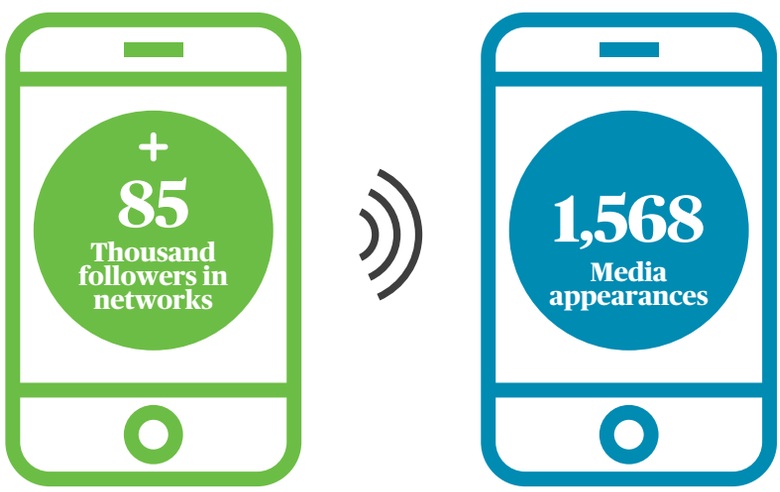
November, 10
Masterclass “Knowing Alzheimer's and everyday life” by Dr. Nina Gramunt in the context of the training programs of the ARED Foundation.

November, 11
Talk “Management of uncertainty in the face of Alzheimer's disease” by Ángeles Castillo within the framework of the “Remember” cycle.

December, 21
Talk “How to enjoy Christmas” by Sandra Poudevida.

3.02

Social networks in 2021



Facebook	Twitter	Linkedin	Youtube	Instagram
55,950 Followers	**11,720** Followers	**5,300** Followers	**3,380** Subscribers	**9,323** Followers
60,794 Interactions	**19,530** Interactions	**954** Interactions	**218,718** Views	**5,727** Interactions
527 Posts	**677** Posts	**24** Posts		**75** Posts
22,52M Impressions	**97,723** Impressions			**137,126** Impressions

con nec tion.

Solidarity has not stopped growing during 2021 and this is demonstrated by our figures. More than 8,700 people joined our commitment to achieve a future without Alzheimer's, which has allowed us to grow our social base, which is what gives us the strength and support necessary to achieve our goal.

ne more year, people and organizations from all over the country, through unforgettable initiatives and ideas, have put their creativity and commitment at the service of the fight to defeat Alzheimer's.

04.

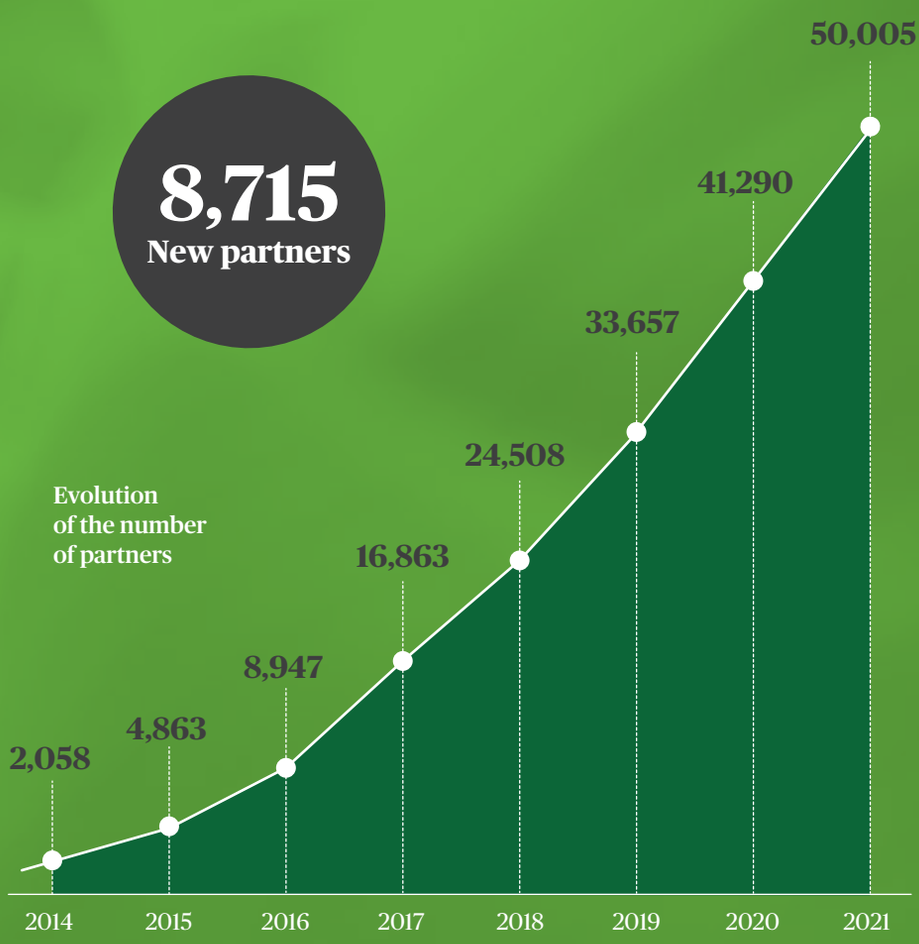
4.01 Partners and donors

In 2021, we welcomed more than **8,700 new partners** who, with their regular contributions, help finance research and social projects, providing them with stability and growth.

During this year, donations also increased, injecting nearly **€400,000** into the Foundation's project.

8,715
New partners

Evolution of the number of partners



4.01

A story to remember

Launch a headline that will never be forgotten: **The creation of the most advanced laboratory in Spain to detect Alzheimer's with a simple blood test**. That was the objective with which we launched the campaign "A news to remember', which exceeded all expectations.

The involvement of individuals and companies made it possible to raise €263,127, well above the initial goal of €150,000.

The sum reached has enabled the start-up of the new Fluid Biomarkers and Translational Neurology laboratory at the Barcelonaβeta Brain Research Center (BBRC), which will have state-of-the-art ultra-sensitive instruments for the early detection of Alzheimer's.

Francis Mateu
Personal donor

"It is difficult to explain the admiration I feel for the work that is done at the Pasqual Maragall Foundation. I am already 73 years old and sometimes I forget little things. My husband has had Alzheimer's for 15 years and Covid has taken him away. I have been collaborating with the Foundation for a long time because they work with highly committed specialists of the highest category worldwide."

Eusebio Díaz-Morera
President of EDM

"From EDM we have been following with great interest the excellent work of research and prevention of Alzheimer's carried out by the Pasqual Maragall Foundation. Through our sponsorship program, it is a great satisfaction to be able to contribute our grain of sand to the project of the new laboratory that will house the study of biomarkers in blood. A future without Alzheimer's or neurodegenerative diseases is one of the enormous challenges of our current society, to which the entire EDM staff joins."

Elena Torrealba
Director of the Susana Monsma Foundation

"From the Susana Monsma Foundation we join the investigation of Alzheimer's disease carried out by the BBRC to contribute to something that we consider exciting: that in the future, all of us can live until the end of our days together with the memories of all a life. We are happy to contribute to a future in which we can continue to enjoy together with our loved ones being aware of it, that we can decide how to live our day to day life without this sad disease transforming us, ceasing to be who we were. Hopefully, the administrations allocate more resources to the investigation of diseases to improve our quality of life."

4.02 Unforgettable actions and entities

Despite the fact that the pandemic has continued to be a protagonist throughout 2021, solidarity initiatives and charity events to raise funds against Alzheimer's have grown exponentially.

These are some of the unforgettable stories we live in 2021.

Solidarity companies

Ametller Origen, with research

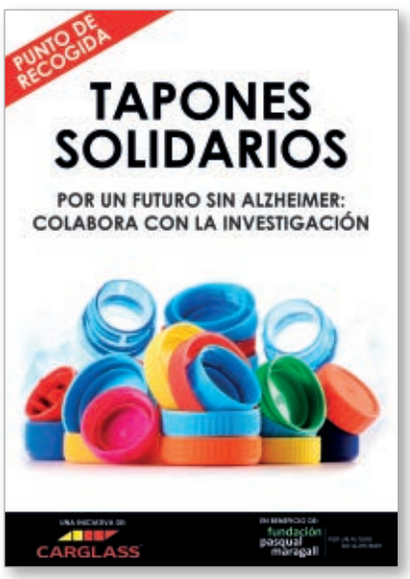
Within the framework of World Alzheimer's Day, **Ametller Origen** launched a solidarity action to support the research against the disease that we carry out from the Pasqual Maragall Foundation.

The company allocated €1 for each bag of walnuts - a dried fruit with beneficial properties for the brain - during the second half of September and the first half of October.

Likewise, it also organized an informative and supportive talk on how healthy lifestyle habits influence disease prevention, which featured Nina Gramunt, neuropsychologist and technical director of the Foundation's Social and Dissemination Area.

The amount from the talk tickets went entirely to our research project.

4.02



Solidarity caps

The **Carglass Spain** team chose the Pasqual Maragall Foundation project as beneficiary from the funds obtained through the collection of plastic caps in all its centers.

The initiative, in force until February 2022, served to donate the amount from the sale of caps that, in 2020, exceeded 15 tons.

Christmas lottery for research

The multinational **MAT Holding** organized a fundraising campaign among its employees to obtain funds for research against Alzheimer's.

Through the draw for the Christmas basket, €1,493 was raised, a figure that the company doubled. "We are proud to collaborate with the Pasqual Maragall Foundation in their preventive research against Alzheimer's. With their promising findings in biomarkers, they are very close to being able to detect the disease very precisely through a simple blood test", declares the MAT team. Holding company.

Christmas for a future without Alzheimer's

The company **CEMOEL** and **Casa Santiveri** congratulated all of their collaborators this Christmas in a very special way by making a donation to support Alzheimer's research.

Solidarity lottery

Vitaldent promoted the online sale of its Christmas lottery including a donation to support Alzheimer's research. Thanks to the solidarity of all its employees, €2,950 was raised.

4.02

Solidarity rounding

Thanks to solidarity rounding, the Pasqual Maragall Foundation managed to raise more than €13,200, which was allocated to our online support program for caregivers of relatives with Alzheimer's.

Club Valvi

The Valvi supermarket chain demonstrated its commitment to social integration by giving away the almost €10,000 that its customers donated to the Pasqual Maragall Foundation through Solidarity Rounding.

The benefits of the campaign, which was carried out during the month of September, were allocated to the online emotional support and training program for caregivers of family members with Alzheimer's, "Learn to care and take care of yourself".

Promofarma

The online sales platform activated the option to donate €1 for each purchase. With just one click, Promofarma managed to collect €3,235 from its customers who donated to the "Learn to take care of yourself" program.

4.02

Although 2021 was a year full of changes, the collaborators of the Pasqual Maragall Foundation did not stop and managed to raise a total of €124,063.69 thanks to the organization of 244 solidarity initiatives, three times more than the previous year, grouped within the project "People and unforgettable ideas for a future without Alzheimer's."

"I believe that there is no better time to help other people not to forget their memories than on your wedding day, an unforgettable day for us. I recommend all brides to collaborate with these initiatives."

Says Paula, one of the unforgettable brides of 2021.

Solidarity initiatives

An unusual event

Hello, copywriter! was a 100% solidarity online event promoted by Marina Febles, creative and writer, who managed to raise €12,300 to benefit the Foundation and its Alzheimer prevention research program.

The meeting, which aimed to learn about direct marketing with great experts in the sector, was organized in ten master classes to which more than 250 people signed up. The full amount of the ticket was used to support the Foundation's research.

A race for the invisible

10 km to make the invisible visible. This was the idea under which 'We Run Project' organized a solidarity race with seven beneficiary entities dedicated to different social causes, among which was the Pasqual Maragall Foundation. 'The invisible race' took place on June 6, in different parts of Spain, simultaneously in virtual format. Thanks to this initiative, €2,350 was raised.

Solidarity concert

In October, the musical group Purple Pansa organized a charity concert at the Auditorium of the Valencian town Rafelbunyol. Thanks to this event, which brought together various musicians and composers, the group managed to raise more than €1,000, which was used for research against Alzheimer's.r.

The music of memory

The Musical Andreuenca Association organized a charity concert to support the research of the Pasqual Maragall Foundation and managed to raise €1,000.67. This has been the third solidarity concert organized by the association and it was in charge of the Jove Banda Simfònica of Barcelona. "When Alzheimer's enters a home, everything stops. Everyone should collaborate as much as possible", explained Antonia Lugo, director of the Jove Banda Simfònica of Barcelona.

Comics and pesetas, united against Alzheimer's

The WASH Comics online store organized a collection of pesetas linked to our campaign "The last mission of the peseta". The action, active between December 2020 and June 2021, managed to raise more than €500 at the various peseta collection points in Madrid.

Yes to solidarity

Throughout the year, solidarity celebrations were organized for a future without Alzheimer's that raised more than €29,000. Through a donation to the Foundation, a celebration or family gathering, such as a wedding or birthday, any celebration can become an even more unforgettable event.

4.03 Solidarity Wills:

"It will be a future without Alzheimer's. It will be thanks to your legacy"

Marimar has included the Pasqual Maragall Foundation in her will: *"I hope that my legacy will serve to continue advancing in research, so that no one has to live what we live."*

Jordi has decided that the Pasqual Maragall Foundation forms part of his will: *"The legacy is assets that I inherited from my father, a transmission belt of his assets to the Foundation. I think I owe this to my father and he would agree. He helped everyone and this is a continuation of what he did. I do it in his name."*

In 2021, 70 people were interested in bequeathing to the next generations a future where Alzheimer's disease has disappeared and they can age with dignity and enjoy life to the full. A future without Alzheimer's where no family has to suffer the consequences of this disease.

Through the campaign 'It will be a future without Alzheimer's. It will be thanks to your legacy', at the Pasqual Maragall Foundation we have received more than €135,000 in 2021 thanks to solidarity wills.

More and more people are encouraged to collaborate with a charitable cause through solidarity wills. In 2020, the Spanish donated 217 million euros to NGOs through solidarity wills, of which 16%, that is, more than 43 million, were channeled through solidarity legacies in Catalonia.

To donate through a will, it is not necessary to have a large fortune or numerous properties. The contribution, whatever the amount, is decisive for further research.

» **For more information on how to make legacies, donations, be a member or organise solidarity actions, call 900 545 545 or send your query or proposal to socios@fpmaragall.org**

Source: College of Notaries of Catalonia.

How can you include Fundación Pasqual Maragall in the last will and testament?

You can donate a part of your estate to the Foundation through a legacy gift. It could be a specific amount of money, a percentage of the value of your estate, property, jewellery, work of art, stock, etc.

If you have no heirs, you can designate Fundación Pasqual Maragall as universal heir, bequeathing all of your estate, rights and/or stock to the Foundation.

If you wish to donate to more than one person and/or institution, you can designate Fundación Pasqual Maragall as coheir, indicating the percentage assigned to each party.

Joint liability carries tax benefits, since the part of the inheritance granted to the Foundation is not taxed with the inheritance tax.

trust.

We build projects and long-term relationships based on trust.

We work with a policy of transparency, good practices and accountability.

05.

5.01 Who are we?

Transparency and good practices:

At the Pasqual Maragall Foundation and the Barcelonaβeta Brain Research Center we have a policy and a code of good practices in transparency and accountability, and we adhere to the code of good scientific practices of the Biomedical Research Park of Barcelona (PRBB).

The Pasqual Maragall Foundation

The **Pasqual Maragall Foundation** is a private non-profit entity that was created in April 2008, in response to the commitment made by Pasqual Maragall (former mayor of Barcelona and former president of the Generalitat of Catalonia) by announcing publicly that he had been diagnosed with Alzheimer's.

The purpose of the Foundation is **to achieve a future without Alzheimer's** and, therefore, its mission is to face the challenges posed by this and other neurodegenerative diseases through scientific solutions, promoting and structuring the support of society to achieve it.

Likewise, it has been working since its inception to change the social consideration of the disease and **raise awareness of its effects through dissemination.**

The Barcelonaβeta Brain Research Center

The **Barcelonaßeta Brain Research Center** is the research center of the Pasqual Maragall Foundation. It was launched in 2012 linked to the Pompeu Fabra University, and with the participation of the "la Caixa" Foundation, and today it is an **international reference center** in the prevention of Alzheimer's.

Its mission is to provide innovative solutions to **decipher and prevent biological changes and cognitive dysfunction associated with neurodegenerative diseases**. Its research team develops neuroimaging projects and primary and secondary prevention of Alzheimer's, and actively participates in international studies and working groups focused on the prevention of the disease.

In the last 5 years, its researchers have published more than **250 articles** in prestigious international journals.

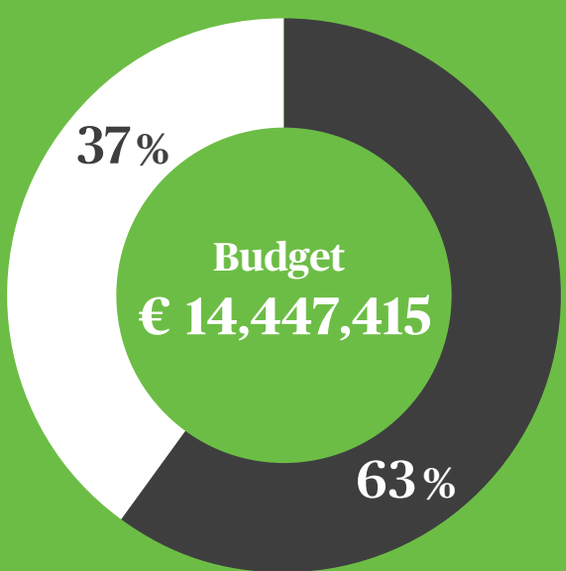
5.02 Origin and destination of resources

At the Pasqual Maragall Foundation we work to achieve a future without Alzheimer's through biomedical research.

To achieve this, we invest most of the resources obtained in research programs, communication and outreach actions to increase social support for our cause.

We also allocate part of the resources to attracting new funds to guarantee the long-term sustainability of ongoing scientific programs.

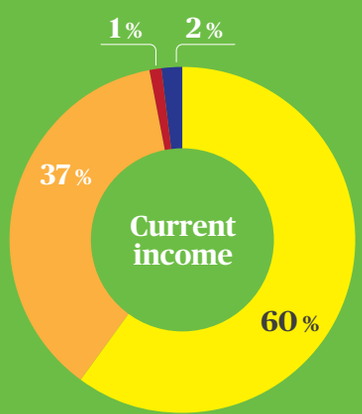
- Pasqual Maragall Foundation **€9,116,996**
- BBRC Research Center **€5,330,419**



5.02

Total revenues € 14,447,415

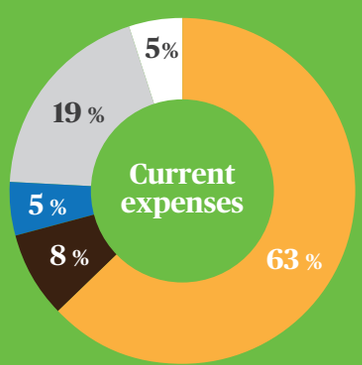
Current income	**€ 14,336,381**
Patrons, partners and donors **(60 %)**	€ 8,530,781
Research projects **(37 %)**	€ 5,343,681
Clinical trial revenue **(1 %)**	€ 202,525
Public incidence and institutional relations, social area and dissemination **(2 %)**	€ 259,394
Income from capital grants *(Not included in the graphic)*	**€ 106,507**
Financial income *(Not included in the graphic)*	**€ 4,527**



Total expenses € 14,225,126

Current expenses	**€ 14,168,620**
Research programs **(63 %)**	€ 8,921,57
Communication and awareness **(8 %)**	€ 1,163,377
Public incidence and institutional relations, social area and dissemination **(5 %)**	€ 662,082
Investment in the network of partners and donors **(19 %)**	€ 2,718,521
Administration **(5 %)**	€ 703,064
Financial expenses *(Not included in the graphic)*	**€ 56,507**

76%



During the year 2021, 76% of the budget has been dedicated directly to our mission, and the remaining 19% has been invested in guaranteeing the future sustainability of this same mission: to achieve a future without Alzheimer's and without any other neurodegenerative disease.

Added data of the **Pasqual Maragall Foundation** and its research center, the **Barcelonaβeta Brain Research Center**.
Data submitted to an annual audit of accounts.

5.03 Collaborators

Our most sincere thanks to the network of partners and donors, and to the entities, companies and professionals who have supported our research through their contributions and collaborations.

Our recognition also to all the volunteers who dedicate their time to us and help us in the organization of actions and events.

Check the complete list of collaborators here:

http://fpmaragall.org/memoria2021

Patronage council

Strategic patron

Fundación "la Caixa"

Great patrons

FUNDACIÓN ACS

Ajuntament de Barcelona

Allianz

Diputació Barcelona

FUNDACIÓN RAMÓN ARECES

Patrons

moventia

Sabadell Fundació

Grupo Cementos Molins

Aigües de Barcelona

Affiliates

enagas

eurofragance

vopi4

Institutional support

Generalitat de Catalunya

Unió Europea
Fons Europeu de Desenvolupament Regional

Associates

- Fundación Adey

Fundación ADEY

- Santalucía Seguros

santalucía SEGUROS

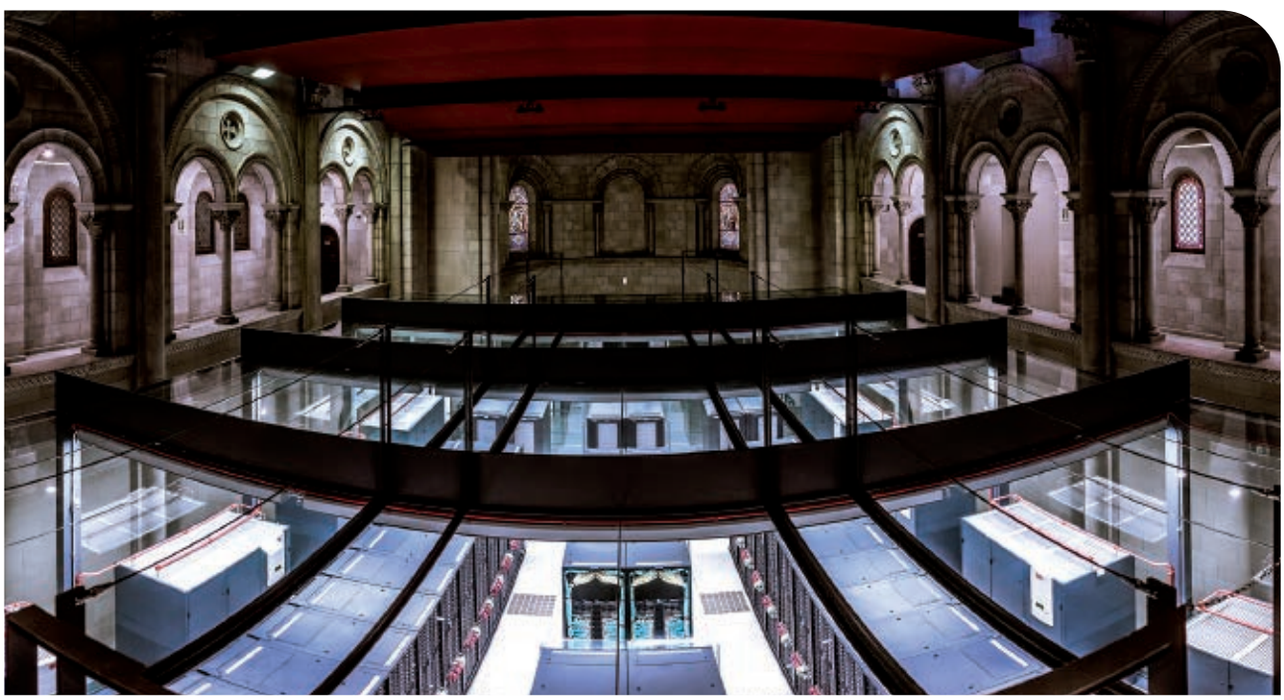
- Ametller Origen
- Caprabo
- Carglass
- EDM
- Fundación Privada Rafael Cusí
- Fundación Susana Monsma
- Hamsa
- Llúria Lighting System
- New Reels, S.L
- Optica Universitaria
- Ricoh

5.03

Academic collaborations

- Amsterdam University Medical Centers
- Barcelona Supercomputing Center
- Centro de Regulación Genómica
- Centro Nacional de Investigaciones Cardiovasculares
- CIBER-BBN
- CIBERFES
- Consorcio AMYPAD
- Consorcio EPAD
- Consorcio EUFINGERS
- Erasmus MC University Medical Center Rotterdam
- F. Hoffmann-La Roche Ltd
- GE Healthcare
- Hospital Clínic de Barcelona
- Hospital Universitari Vall d'Hebron
- Institut d'Investigacions Biomèdiques August Pi i Sunyer
- Institut Hospital del Mar d'Investigacions Mèdiques
- ISGlobal
- Karolinska Institute
- Leiden University Medical Center
- Lund University
- Philips
- Roche Diagnostics
- Universitat Autònoma de Barcelona
- Universitat Politècnica de Catalunya
- Universitat Pompeu Fabra
- University College London
- University of Edinburg
- University of Gothenburg
- University of Wisconsin-Madison

▸ Barcelona Supercomputing Center.



5.04 Board

pasqual maragall foundation

Configuration from February 2021

Honorary President
Pasqual Maragall Mira

President
Cristina Maragall Garrigosa
Lifetime chairperson

1st Vice President
Santiago de Torres Sanahuja
Lifetime chairperson

2nd Vice President
Montserrat Vendrell Rius

3rd Vice President
Jordi Camí Morell
Patró vitalici

Other lifetime chairpersons
Guillem Maragall Garrigosa
Narcís Serra Serra
Airy Maragall Garrigosa

Board members
Nuria Basi Moré
Joaquim Coello Brufau
Joaquim Boixareu Antolí
María Carmen Garmendia Lasa
Marta Grabulosa Areny
Arcadi Navarro Cuartiellas
Bancària Caixa d'Estalvis i Pensions de Barcelona Foundation, "la Caixa"
(representing Antonio Vila Bertrán, substitute: Àngel Font Vidal)
Jordi Mercader Miró
Pura Muñoz-Cánoves
Marcel Prunera Colomer
David Vegara Figueras

On behalf of the Patronage Council
Fundació ACS
(representing Antonio García Ferrer)
Fundación Privada Banco Sabadell
(representing Miquel Molins Nubiola)

Secretary and Deputy Secretary (not trustees)
Ignasi Costas Ruiz del Portal
Alberto Ouro Fuente

Executive Committee

President
Montserrat Vendrell Rius

Board Members
Jordi Camí Morell
Joaquim Coello Brufau
Marcel Prunera Colomer
Arcadi Navarro Cuartiellas

Secretary and Deputy Secretary (not trustees)
Ignasi Costas Ruiz del Portal (DWF-RCD)
Alberto Ouro Fuente (DWF-RCD)

5.04 Board

barcelonaβeta
BRAIN RESEARCH CENTER

Configuration from February 2021

President
Montserrat Vendrell Rius

Director
Arcadi Navarro Cuartiellas

Members
Arcadi Navarro Cuartiellas
Jordi Camí Morell
Joaquim Coello Brufau
Universitat Pompeu Fabra
(José Garcia Montalbo)
Josep Martorell Rodon
Francesc Posas Garriga
Marcel Prunera i Colomer
"la Caixa" Foundation
(representing Antonio Vila Bertrán, substitute: Àngel Font Vidal)

Secretary and Deputy Secretary (not trustees)
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"la Caixa" Foundation
(representing Antonio Vila Bertrán, substitute: Àngel Font Vidal)

2021 Annual report

“Nowhere is it written that Alzheimer’s is invincible”

Pasqual Maragall
October 2007

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pasqual maragall foundation

barcelonaβeta
BRAIN RESEARCH CENTER