

2019

Annual Report



ehu group 

Achucarro
BASQUE CENTER FOR NEUROSCIENCE

scientia ad remedium

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FOREWORD

Dear reader,

Welcome to the new Annual Report of the **Achucarro Basque Center for Neuroscience**.

The year 2019 culminates a period of consolidation and growth of our centre. Our ties with academia and the student community are stronger than ever as ACHUCARRO has become more visible and interactive, as well as an international hallmark for neuroscience research.

Three new senior researchers have joined ACHUCARRO this year, two as Ikerbasque Research Fellow and one as Professor. We welcome Amaia Arranz, Eva Benito and Maria Kukley, and wish them a successful career take off with us. Dr. Benito has brought new expertise on epigenetics and transcriptomics, while Dr. Arranz and Dr. Kukley started their independent laboratories on humanized models of disease, and on neuron and glial physiology, respectively. Their incorporation to our centre contributes to substantially advance in our Equality Plan to balance gender at the senior and group leader level.

The end of 2019 marks also the equator of the BERC Programme for the 2018-2021 period. The midterm report to our funders indicates that we have reached all the indicators set for the first two years.

In particular, the performance of our research groups in 2019 was excellent with 50 publications (80% in the first quartile), seven completed international PhDs, in both instances well above from the objectives set by our funders. Of note, we continue strengthening our contribution to training undergraduate and master students by increasing the number of completed Graduate and Master Dissertations. In addition, the dynamic Mentoring Programme along with weekly seminars, by highly qualified visiting neuroscientists, boost our training capacity of researchers in all their career stages.

We succeeded in attracting external funding to support our infrastructures and **acquire a SIMOA platform for highly sensitive detection of biomarkers of neurodegeneration and inflammation in animal and human blood** and other body fluid samples. This new and singular equipment is the only one available in the Basque Country and among the very few in Spain.

The results and accomplishments in the 2019 report illustrate how **ACHUCARRO is paving its way to excellence in research and creating a unique international trademark in neurosciences**.

We thank the continuous support of Ikerbasque - the Basque Foundation for Science and the University of the Basque Country (UPV/EHU), our main allies in this challenging effort.

Carlos Matute
**Scientific
Director**

ACHUCARRO deploys a management model based in processes, designed according to the guidelines and recommendations of the European Foundation for Quality Management (EFQM) and the Basque Foundation for Quality (Euskalit). In coherence with this approach, the structure of this document follows that process-driven operational deployment.

1. Strategy and Management

The Basque Government fostered the creation of the Basque Research Centre in the field of neuroscience within the network of Basque Excellence Research Centres (BERC) in 2012.

The founding partners of this new centre were Ikerbasque - the Basque Foundation for Science, the University of the Basque Country (UPV/EHU), and BIOEF – the Basque Foundation for Health Innovation and Research, which currently compose the Board of Trustees of the legal entity behind the centre, a non-profit foundation, under the Basque and Spanish laws.

In the year 2018, we launched the deployment of our second strategic plan for the period 2018-2021. In this period, our main strategic objective is to consolidate the structure and the path established in the past, looking forward and adapting to the changing environment in scientific research within a global momentum of tremendous changes.

Scientific Plan 2018–2021

The Mission of ACHUCARRO is to contribute to the development of a socially and economically sustainable society. We attain this shared challenge by performing high quality research in the field of neuron-glia biology and interactions, in the normal and pathological brain.

The foundations that support our endeavour are:

- ▶ Recruit, Reintegrate and Retain **talented research personnel**, to perform excellent research and contribute to the **advanced post-graduate training**.
- ▶ Develop **modern infrastructures** within the Science Park of the UPV/EHU, within the University campus in Leioa.
- ▶ Assess and incorporate the latest **technologies and equipment** to let the centre operate in the frontier of knowledge.
- ▶ To perform **research projects** centred in the study of glial cells in order to contribute to the discovery of **new therapies** for neurological diseases for the benefit and **well-being of the Society**.

To meet these goals, we designed a Strategic Plan for the period 2018–2021, supervised by our International Scientific Advisory Board and approved by our Board of Trustees that contains **three high-level research programmes**:

► **Characterization of the role of glial cells in the physiology of the nervous system**

- roles of astrocytes in synaptic communication
- neurotransmitter signalling during neurogenesis and gliogenesis
- mechanisms of microglia phagocytosis during neurogenesis

► **Characterization of structural and functional changes of neuronal-glial networking in the aged brain**

- age-dependent remodelling of neuronal-glial signalling
- regulation of the intrinsic properties of neural stem cells in the adult hippocampus

► **The role of neuroglia in neurodegenerative diseases and other neurological disorders**

- research on general mechanisms of neuron and glial cell death
- understanding the pathophysiology of Alzheimer's disease and epilepsy
- autoimmune pathogenesis of multiple sclerosis (MS) and neuroinflammation

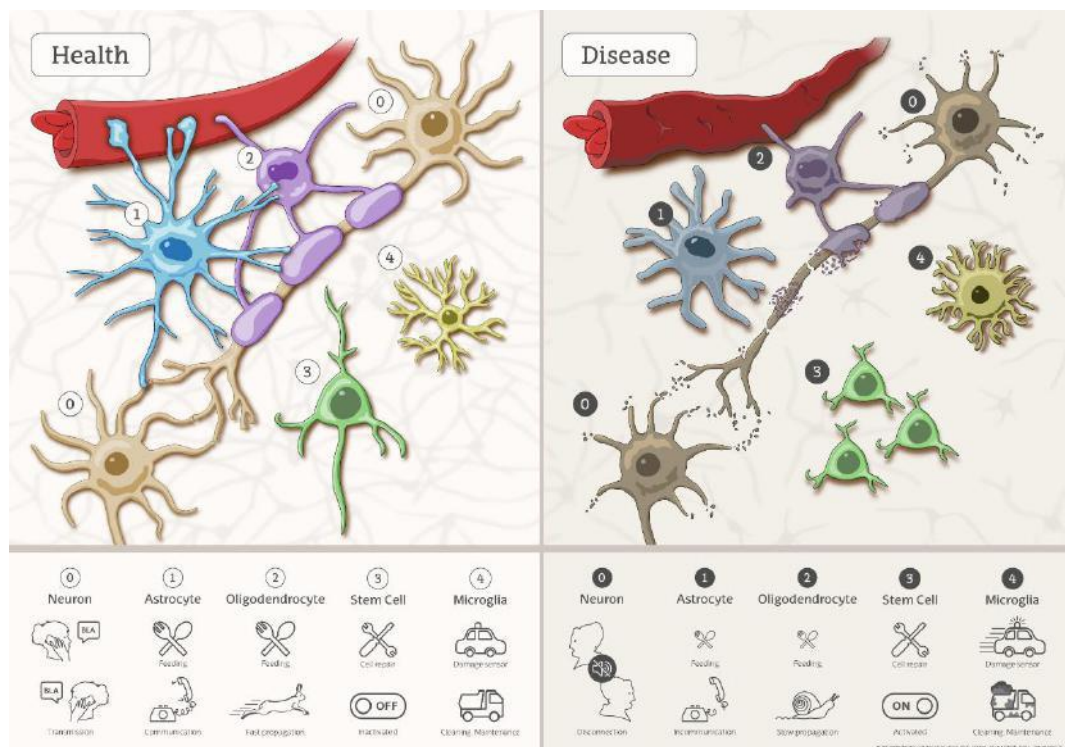


Figure 1. Schematics of our research focus

Management Plan 2019

The political instability in Spain during this year had an influence in the management and funding of the Science system, and therefore, an impact in our operations. The delays in the resolution of the basic funding schemes and the reductions in their budgets drove to an scenario where excellence parameters maintain, but the economic resources to develop the process continue reducing, while the costs for developing novel techniques and perform experimental research increases, due to the global inflation rate, and the need of more investment to cope with all the requirements of the referees of the top journals.

ACHUCARRO is in the path of stability and consolidation, but the effect of the environmental variables and boundary conditions affect the capacities of our smaller groups, with brave young Group Leader that are trying hard to establish and develop their raising research groups. Part of our management effort this year went to this axis of activity.

The assessment and incorporation of strategic equipment and technologies has been another important axis. In 2019 we launched the SIMOA platform within the Proteomics Facility. This technology will allow us to advance in our capacity of research and interaction with clinicians, and to develop state of the art translational work.

We estimate that according to the overall structural condition in our socio-economic environment, the performance of our centre has been excellent (see section **7. Main performance indicators**), and we managed to complete successfully our Management Plan for 2019.

Equality Plan 2018-2021

In 2017, we underwent an internal analysis and reflection process to improve the policies and our organisational culture towards the Equality, with the support of *Emakunde*, the Basque Institute for Women. The result of this process was the first **Achucarro Equality Plan, for the period 2018-2021**.

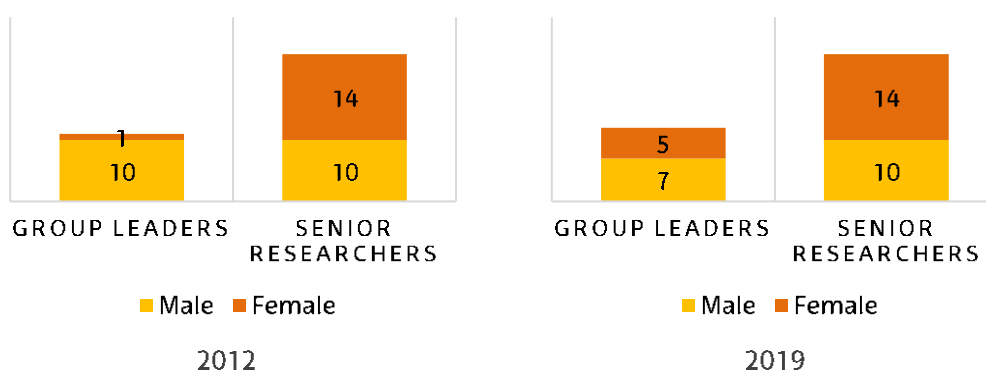
This first plan identifies four main areas of work to improve our commitment with equal opportunities:

1. Promoting equal opportunities in positions of responsibility
2. Generate working environments and conditions that facilitate the co-responsible conciliation of personal, family and professional life
3. Incorporate the gender perspective in the policies, products and operating dynamics
4. Promote inclusive leadership styles

The Plan launched in January 2018, being one of the first activities to appoint an **Equality Committee**, composed by representatives of personnel on different functions or career stages, from each gender.

During 2019 we have advanced in the implementation of the actions of the Plan and confirmed that they are being fruitful. For example, the number of women leading groups and being the Principal Investigators in projects is increasing:

Figure 3. Evolution of number of Group Leader and Senior researchers by gender



<https://www.achucarro.org/equality>

The importance that we confer to institutional relationships required a process to properly manage and maintain mutually beneficial partnerships. This process classifies the different types of collaborations, attending to the framework environment or the impact of each partnership in the development and achievement of our strategic objectives.

2. Partnerships and Collaborations

According to the objectives and fields of activity, we classify the collaboration and partnership relationships we create and maintain in three different types: Institutional, Strategic or Operational.

Institutional Alliances

We formalise institutional partnerships with specific written long-term agreements, which cover the terms of the collaboration. To some extent, such alliances are also strategic in nature, as indicated by the agreements signed with Ikerbasque and the UPV/EHU for the appointment of personnel.

These are our current institutional agreements by partner:

BASQUE GOVERNMENT

- ▶ Agreement to support the activities of the centre in the period 2018–2021
- ▶ Agreement to support the development of the Euro-Biolmaging node candidate in Bilbao

IKERBASQUE

- ▶ Framework Agreement for the appointment of research staff: Ikerbasque Research Professors, Associates and Fellows
- ▶ Specific agreements and annual protocols for the co-funding of Ikerbasque research staff

UNIVERSITY OF THE BASQUE COUNTRY (UPV/EHU)

- ▶ Framework Collaboration Agreement
- ▶ Specific agreement for the appointment of the Scientific Director
- ▶ Specific agreement for the appointment of teaching and research and personnel

BASQUE SCIENCE, TECHNOLOGY AND INNOVATION NETWORK

- ▶ Attachment to this network and recognition in the “BERC - Basque Excellence Research Centre” category

Our strategic alliances are those organisations or individuals that allow us to extend our capabilities or complement our services.

Strategic Alliances



Bizkaia Talent

Established in 2005 with the support of the Provincial Council of Bizkaia, Bizkaia Talent is a non-profit organization that fosters and facilitates the attraction, connection, and retention of highly qualified professionals to the Basque Historic Territory of Bizkaia. Bizkaia Talent is a strategic partner and an ally of ACHUCARRO, which takes our name and objectives to the many international scientific events they attend, supporting our talent attraction process.



European Commission – HRS4R Community

Following our endorsement of the European Charter for Researchers fostered by the European Commission, we underwent the process of recognition of our internal policies for managing research personnel, according to HRS4R and OTM-R initiatives of the European Commission.



In 2019 we received a delegation from the National Institute of Mental Health of the Czech Republic, for a mutual learning workshop between them and some Basque institutions developing strategies on HRS4R. The outcome of this meeting was excellent and allowed interesting interactions among all parties.



Participants in the NIMH – Basque institutions HRS4R workshop

The International Scientific Advisory Committee is the main strategic advisory body of ACHUCARRO. Its primary role is to advise, supervise, and assess the objectives and performance of the different groups and professionals of the centre.

International Scientific Advisory Committee (ISAC)

The BERC centres, as many other organisations, in different sectors of activity, are required to have an advisory committee.

In our case, the International Scientific Advisory Committee is a panel of distinguished researchers in different areas of neuroscience that provide us with their view and opinion on the strategic and operational subjects for the better development of ACHUCARRO.



Figure 4. Members of the ISAC at the end of 2019

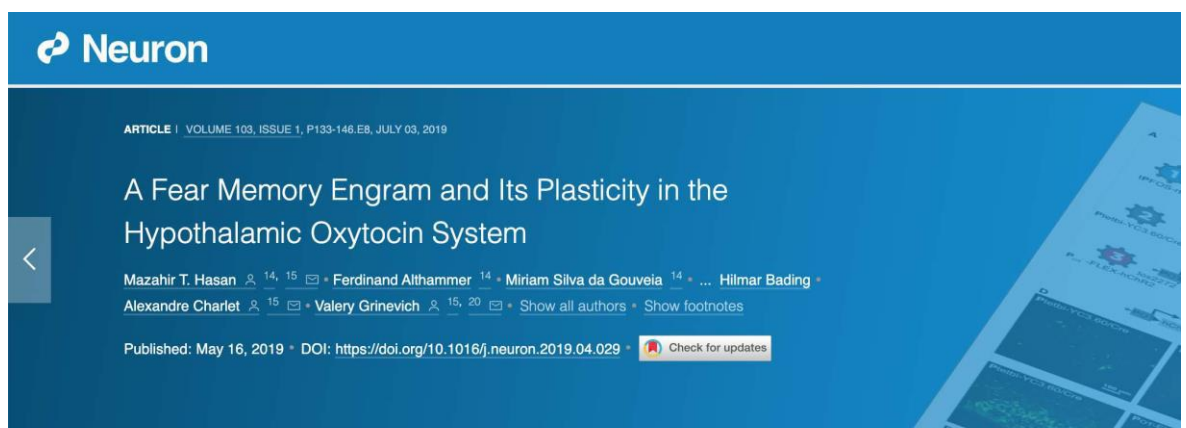
In July 2019 we lost a beloved friend and colleague, Christian Giaume (Nice, 1951 - Paris, 2019), who was a Research Director of CNRS at the Collège de France.

Highlights in research outcomes

The quest to reveal where memories are organized in the brain is central in “unlocking” the molecular and cellular mechanisms for encoding and preserving memories.

Memory engrams discovered in the hypothalamus

The essential role for memories is pivotal for survival, so it goes without saying that the constellation of interacting cells that form memory engrams must go well back along the evolutionary time scale. However, the prevailing dogma today is that memories are formed in the hippocampus and later stored in the cortex. This limited view does not take into consideration the other brain structures, especially the evolutionarily older brain structures, performing dynamic re-organization of anatomical and functional circuits for forming and storing context-specific memories.



Highlights

- A novel method, vGATE, selectively tagged fear-activated oxytocin (OT) neurons
- A subset of tagged OT neurons encodes for context-specific memory engram
- Fear learning induces long-term plasticity in OT neurons
- vGATE-tagged OT neurons predominantly operate by glutamate

“A Fear Memory Engram and Its Plasticity in the Hypothalamic Oxytocin System”

Hasan, Mazahir T. [...] Grinevich, Valery

Neuron (Jul-03) DOI: [10.1016/j.neuron.2019.04.029](https://doi.org/10.1016/j.neuron.2019.04.029)



People are the cornerstone of ACHUCARRO. Their knowledge, competences, capabilities and involvement constitute a differential competitive factor for any organisation.

3. People

At the end of 2019, ACHUCARRO was an organisation of 89 people.

ACHUCARRO attracted the 45% of the Senior research staff since 2012. Professional of 12 different nationalities that came from 20 different countries from all the continents.

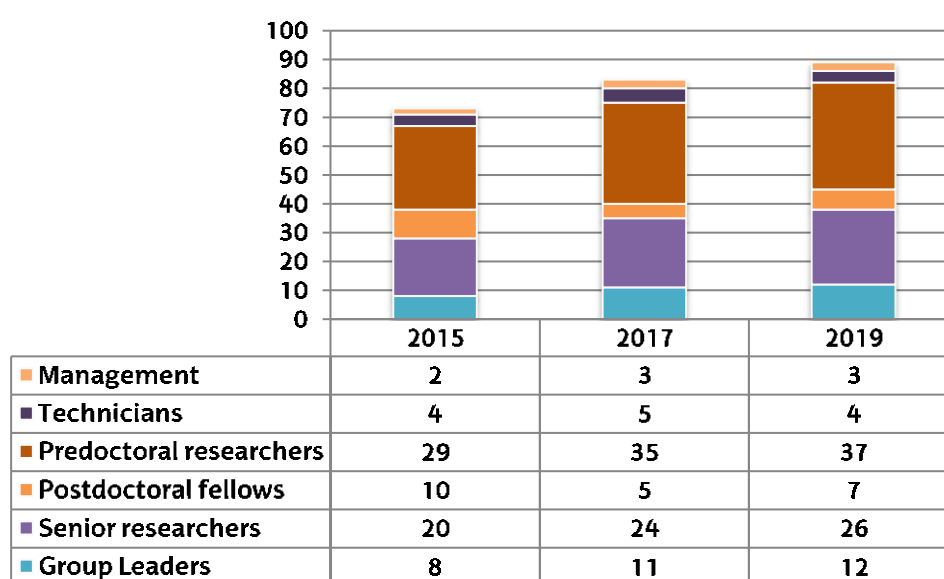


Figure 5. Evolution of personnel 2015-2019

Some of our colleagues (11) finished their projects, stays or appointments during 2019, but we welcomed (13) more new talented professionals to continue developing our organisation.

Colleagues finishing their appointment this year

Iraide **Alloza** (Senior Researcher) Xabier **Cáceres** (Management Assistant) Sergio **Castaño** (Postdoctoral Fellow) Andrea **Manterola** (PhD Student) Jorge **Mena** (PhD Student) Carolina **Ortiz** (PhD Student) Tania **Quintela** (Postdoctoral Fellow) Victor **Rodríguez** (PhD Student) Naiara **Royo** (PhD Student) Koen **Vandenbroeck** (Group Leader) Alazne **Zabala** (PhD Student)

Appointed Staff (2019/12)

Oihane **Abiega** (Postdoctoral Fellow) Svein **Achicallende** (Predoctoral researcher) Elena **Alberdi** (Senior Researcher) María **Ardaya** (Predoctoral researcher) Amaia **Arranz** (Group Leader) Alazne **Arrazola** (Predoctoral researcher) Elsa **Astorga** (Predoctoral researcher) Jimena **Baleriola** (Group Leader) Laura **Bayón** (Predoctoral researcher) Sol **Beccari** (Predoctoral researcher) Eva **Benito** (Senior Researcher) Maite **Blanco** (Predoctoral researcher) Itziar **Bonilla** (Predoctoral researcher) Ianire **Buceta** (Senior Researcher) Estibaliz **Capetillo** (Senior Researcher) Alejandro **Carretero** (Postdoctoral Fellow) Fabio **Cavaliere** (Senior Researcher) Juan Carlos **Chara** (Technician) Joanna **Danielewicz** (Postdoctoral Fellow) María **Domercq** (Senior Researcher) Irene **Durá** (Predoctoral researcher) Jon **Egaña** (Predoctoral researcher) Izaskun **Elezgarai** (Senior Researcher) Juan Manuel **Encinas** (Group Leader) Laura **Escobar** (Technician) Marian **Fernández** (Management Assistant) María **Gamarra** (Predoctoral researcher) Adhara **Gaminde** (Predoctoral researcher) Laura **García** (Project Manager) Fernando **García-Moreno** (Senior Researcher) Inmaculada **Gerrikagoitia** (Senior Researcher) Paula **Gimenez** (Predoctoral researcher) Sonia **Gómez** (Senior Researcher) Pedro **Grandes** (Group Leader) Mazahir T. **Hasan** (Group Leader) Leire **Izagirre** (Predoctoral researcher) Ana **Joya** (Predoctoral researcher) Maria **Kukley** (Group Leader) Rizky **Lasabuda** (Predoctoral researcher) Leire **Lekunberri** (Predoctoral researcher) Francisco **Llaveró** (Postdoctoral Fellow) Celia **Luchena** (Predoctoral researcher) Miriam **Luque** (Predoctoral researcher) Saioa **Marcos** (Technician) Mar **Márquez** (Predoctoral researcher) Soraya **Martín** (Postdoctoral Fellow) Abraham **Martín** (Group Leader) Susana **Mato** (Senior Researcher) Carlos **Matute** (Scientific Director) Aitor **Medrano** (Predoctoral researcher) Juan **Mendizabal** (Senior Researcher) Amaia **Mimenza** (Predoctoral researcher) Alejandro **Montilla** (Predoctoral researcher) Alvaro **Moreno** (Predoctoral researcher) Teresa **Muro** (Predoctoral researcher) Ana **Palma** (Predoctoral researcher) Aitor **Palomino** (Facility Manager) Olatz **Pampliega** (Group Leader) Iñaki **Paris** (Predoctoral researcher) Oier **Pastor** (Predoctoral researcher) Fernando **Pérez-Cerdá** (Senior Researcher) Alberto **Pérez-Samartín** (Senior Researcher) José Ramón **Pineda** (Senior Researcher) Ainhoa **Plaza** (Postdoctoral Fellow) Nagore **Puente** (Senior Researcher) Almudena **Ramos** (Senior Researcher) Paula **Ramos** (Predoctoral researcher) Leire **Reguero** (Senior Researcher) Irantzu **Rico** (Senior Researcher) Noelia **Rodríguez** (Predoctoral researcher) Ane **Rodríguez** (Predoctoral researcher) Eneritz **Rueda** (Predoctoral researcher) Asier **Ruiz** (Senior Researcher) Jaime **Sagarduy** (General Manager) María Victoria **Sánchez-Gómez** (Senior Researcher) Rafael **Sarria** (Senior Researcher) Maitane **Serrano** (Predoctoral researcher) Mari Paz **Serrano** (Postdoctoral Fellow) Virginia **Sierra** (Predoctoral researcher) Amanda **Sierra** (Group Leader) Edgar **Soria** (Senior Researcher) Federico N. **Soria** (Senior Researcher) Vanja **Tepavcevic** (Senior Researcher) Itziar **Terradillos** (Predoctoral researcher) Jan **Tønnesen** (Group Leader) Jorge **Valero** (Senior Researcher) Maria **Vella** (Predoctoral researcher) Alexei **Verkhatsky** (Group Leader) Jone **Zuazo** (Predoctoral researcher) José Luis **Zugaza** (Group Leader)

Career Development

Together with the Mentoring Programme launched in 2018, during 2019 we have advanced in the definition and deployment of other activities to support career development, training and internal dynamics to strengthen our collective and mutual learning capabilities.

March 8th – International Women's Day



Following our commitment with Equality, we organised an internal workshop to raise awareness about the situation of women in science, and about the inequalities that exist in the scientific world, worldwide. The speakers were our colleagues Amanda Sierra and Jose Luis Zugaza.

Internal training



The Mentoring groups helped identifying different subjects of interest for our staff.

In 2019 we hosted two internal training events, one about Scientific Writing and another about career alternatives, out of academia.

Open, Transparent, Merit-based Recruitment

The Board of Trustees and the Direction of ACHUCARRO endorsed the **European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers** fostered by the European Commission as the first decision of the first meeting of Trustees in 2012.

This decision led to a mandate to start an internal assessment process to define and improve the policies to attract, retain and support the development of careers of the research personnel of the centre.

In September 2013, the European Commission awarded us with the **HR Excellence in Research** recognition to our commitment with the *European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers*, and the rest of the recommendations (OTM-R) set by the Human Resources Strategy for Research (HRS4R) working group.



In the last quarter of 2019, we underwent a new self-assessment process and concluded in a report submitted to the European Commission, and the consequent site visit by a panel of three external experts in the HRS4R strategy.

The outcome of this process was excellent, as it helped identifying interesting improvement areas and ideas that we added to our Action Plan from the next period.

More information about this strategy and actions are available at the website:

<https://www.achucarro.org/hrs4r>

ACHUCARRO contributed with 50 new publications in 2019, 80% of them in the first quartile and 36% in the first decile journals.

4. Research

Our research groups develop their research lines within the framework of our Strategic Research Programme for the period 2018-2021.

These are the laboratories and their group leaders at the end of 2019:

Research Groups

*Laboratory of
Humanized Models
of Disease*



Amaia Arranz
Group Leader
Ikerbasque Research Fellow

*Laboratory of
Local Translation in
Neurons and Glia*



Jimena Baleriola
Group Leader
Ramón y Cajal Fellow

*Laboratory of
Neural Stem Cells and
Neurogenesis*



Juan Manuel Encinas
Group Leader
Ikerbasque Research Professor

*Laboratory of
Ultrastructural and
Functional
Neuroanatomy of the
Synapse*



Pedro Grandes
Group Leader
Full Professor at the Department
of Neurosciences (UPV/EHU)

*Laboratory of
Memory Circuits*



Mazahir T. Hasan
Group Leader
Ikerbasque Research Professor

*Laboratory of
Neuronal and Glial
Physiology*



Maria Kukley
Group Leader
Ikerbasque Research Professor

*Laboratory of
Neurobiology*



Carlos Matute
**Scientific Director and Group
Leader**
Full Professor at the Department
of Neurosciences (UPV/EHU)

*Laboratory of
Neuroimaging and
biomarkers of
inflammation*



Abraham Martín
Group Leader
Ramón y Cajal Fellow

*Laboratory of
Glial and Neuronal
Autophagy*



Olatz Pampliega
Group Leader
Ramón y Cajal Fellow

*Laboratory of
Glial Cell Biology*



Amanda Sierra
Group Leader
Ramón y Cajal Fellow

*Laboratory of Neuronal
Excitability*



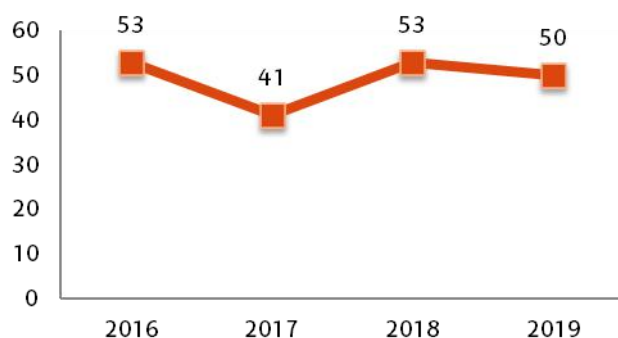
Jan Tønnesen
Group Leader
Ramón y Cajal Fellow

*Laboratory of
GTPases and
Neurosignalling*



Jose Luis Zugaza
Group Leader
Ikerbasque Research Professor

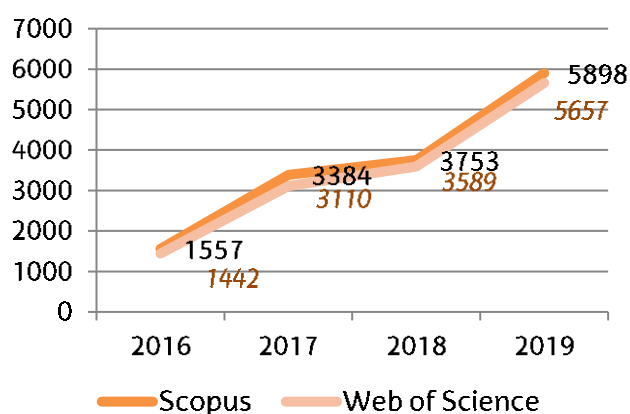
Some output indicators



Publications

In the year 2019, we published a total of 50 research articles.

86% of them were published in journals of the first quartile of their areas, and 42% of the papers in the first decile.



Citations

Our publications have received nearly 6.000 cites (excluding self-cites), which represents **a mean of 20 cites per paper, in the period 2013-2019.**

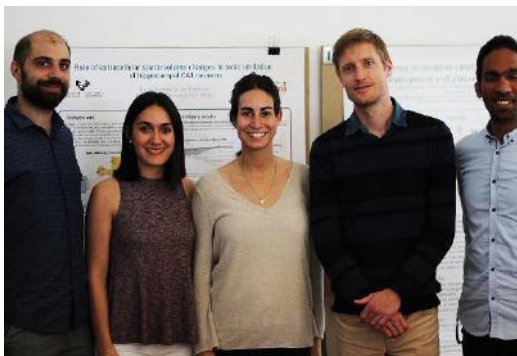
For more results check the section **7. Main performance indicators.**

Nicolás Achúcarro y Lund, the neuroscientist of Basque origin that gives the name to our centre was born on June 14th (1880). Therefore, June each year is the perfect time to take this moment of reflection, networking, discussion and mutual learning.

ACHUCARRO DAY 2019

After completing the first Strategic Plan period in 2014 – 2017, and the corresponding assessment plenary visit of our International Scientific Advisory Committee (ISAC) in June 2017, we decided to create an internal forum to gather and discuss the challenges of our research topics.

In 2019 we organised the second edition and moved to Bilbao to host with gathering.



Two ISAC members are always invited and present on Achucarro Day events, in 2019 Isabel Fariñas and Erik Boddeke shared the day with all of us.

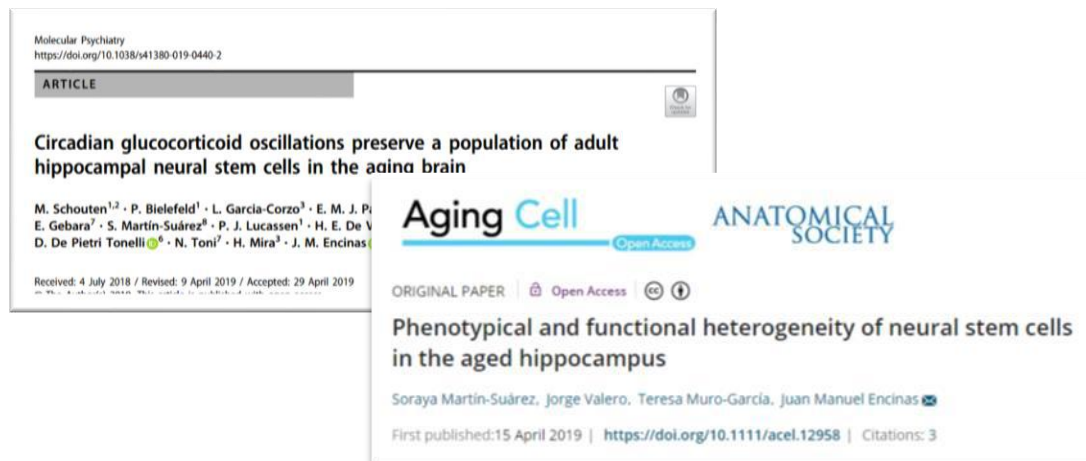
Highlights in research outcomes

A population of neural stem cells residing in the hippocampus keeps generating new neurons in the brain of most mammals through a process called adult hippocampal neurogenesis. With age however, the generation of new neurons decline sharply because the population of neural stem cells that generate them disappear progressively. This mechanism however does not explain the decline fully or why even in very old brains there is still neurogenesis.

Reducing neurogenesis to preserve neurogenesis, brain aging makes use of a neural stem cell paradox

In this research work we have shown that most of those neural stem cells that remain in the aged brain -termed "omega"- present alterations in their properties. They enter a senescent-like state in which they are less likely to divide to generate neurons. Mimicking the progressive neuroinflammatory state of the aging brain promotes the conversion of normal into omega neural stem cells. The results have been published in *Aging Cell*, one of the most prestigious journals in the field of aging. However, reducing the activation of neural stem cells to generate neurons might preserve the neural stem cell population into aging. Authors S Martín-Suárez and JM Encinas have collaborated with C. Fitzsimon's group in the University of Amsterdam to test this hypothesis.

In an article published in *Molecular Psychiatry*, a top journal in biomedicine, the researchers show how neural stem cells express more receptors for corticoid hormones during aging. Corticoids, similarly to neuroinflammation, also reduce neural stem cell activation and thus act as a parking brake on their division so that the population is preserved over time and neurogenesis, although at a low level, remains in the aged hippocampus.



"Phenotypical and functional heterogeneity of neural stem cells in the aged hippocampus"

Martín Suárez, Soraya; Valero, Jorge; Muro García, Teresa; Encinas, Juan Manuel
Aging Cell (Aug-01) DOI: 10.1111/accel.12958

Publications

1. **Loss of Dmrt5 Affects the Formation of the Subplate and Early Corticogenesis**
Ratié, Leslie; Desmaris, Elodie; García-Moreno, Fernando; Hoerder-Suabedissen, Anna; Kelman, Alexandra; Theil, Thomas; Bellefroid, Eric J.; Molnár, Zoltán
Cerebral Cortex (Dec-16) DOI: 10.1093/cercor/bhz310
2. **RAG-2 deficiency results in fewer phosphorylated histone H2AX foci, but increased retinal ganglion cell death and altered axonal growth**
Álvarez-Lindo, Noemí; Baleriola, Jimena; Ríos, Vivian de los; Suárez, Teresa; Rosa, Enrique J. de la
Scientific Reports (Dec-06) DOI: 10.1038/s41598-019-54873-w
3. **Mcardle disease: New insights into its underlying molecular mechanisms**
Llavero, F.; Sastre, A.A.; Montoro, M.L.; Gálvez, P.; Lacerda, H.M.; Parada, L.A.; Zugaza, J.L.
International Journal of Molecular Sciences (Nov-25) DOI: 10.3390/ijms20235919
4. **Principal criteria for evaluating the quality, safety and efficacy of hMSC-based products in clinical practice: Current approaches and challenges**
Guadix, J.A.; López-Beas, J.; Clares, B.; Soriano-Ruiz, J.L.; Zugaza, J.L.; Gálvez-Martín, P.
Pharmaceutics (Oct-24) DOI: 10.3390/pharmaceutics11110552
5. **Cien Años de Microglía: Milestones in a Century of Microglial Research**
Sierra, Amanda; Paolicelli, Rosa C.; Kettenmann, Helmut
Trends in Neurosciences (Oct-18) DOI: 10.1016/j.tins.2019.09.004
6. **Insult-induced aberrant hippocampal neurogenesis: Functional consequences and possible therapeutic strategies**
Bielefeld, P.; Durá, I.; Danielewicz, J.; Lucassen, P. J.; Baekelandt, V.; Abrous, D. N.; Encinas, J. M.; Fitzsimons, C. P.
Behavioural Brain Research (Oct-17) DOI: 10.1016/j.bbr.2019.112032
7. **Radiochemical examination of transthyretin (TTR) brain penetration assisted by iododiflunisal, a TTR tetramer stabilizer and a new candidate drug for AD**
Rios, Xabier; Gómez-Vallejo, Vanessa; Martín, Abraham; Cossío, Unai; Morcillo, Miguel Ángel; Alemi, Mobina; Cardoso, Isabel; Quintana, Jordi; Jiménez-Barbero, Jesús; Cotrina, Ellen Y.; Valencia, Gregorio; Arsequell, Gemma; Llop, Jordi
Scientific Reports (Sep-20) DOI: 10.1038/s41598-019-50071-w
8. **Interactome of the Autoimmune Risk Protein ANKRD55**
Ugidos, N.; Mena, J.; Baquero, S.; Alloza, I.; Azkargorta, M.; Elortza, F.; Vandenbroeck, K.
Frontiers in Immunology (Sep-18) DOI: 10.3389/fimmu.2019.02067
9. **tDCS recovers depth perception in adult amblyopic rats and reorganizes visual cortex activity**
Castaño-Castaño, S.; Feijoo-Cuaresma, M.; Paredes-Pacheco, J.; Morales-Navas, M.; Ruiz-Guijarro, J. A.; Sanchez-Santed, F.; Nieto-Escámez, F.
Behavioural Brain Research (Sep-16) DOI: 10.1016/j.bbr.2019.111941
10. **(Review) Astroglial atrophy in Alzheimer's disease**
Verkhatsky, Alexei; Rodrigues, Jose Julio; Pivoriunas, Augustas; Zorec, Robert; Semyanov, Alexey
Pflügers Archiv - European Journal of Physiology (Sep-13) DOI: 10.1007/s00424-019-02310-2
11. **(Review) Small GTPases of the Ras superfamily and glycogen phosphorylase regulation in T cells**
Llavero, Francisco; Sastre, Alazne Arrazola; Montoro, Miriam Luque; Martín, Miguel A.; Arenas, Joaquín; Lucia, Alejandro; Zugaza, José L.
Small GTPases (Sep-12) DOI: 10.1080/21541248.2019.1665968
12. **Cognitive and neurobehavioral benefits of an enriched environment on young adult mice after chronic ethanol consumption during adolescence**

- Rico-Barrio, Irantzu; Peñasco, Sara; Puente, Nagore; Ramos, Almudena; Fontaine, Christine J.; Reguero, Leire; Giordano, Maria Elvira; Buceta, Ianire; Terradillos, Itziar; Lekunberri, Leire; Mendizabal-Zubiaga, Juan; Fonseca, Fernando Rodríguez de; Gerrikagoitia, Inmaculada; Elezgarai, Izaskun; Grandes, Pedro
Addiction Biology (Sep-01) DOI: 10.1111/adb.12667
13. **Purinergic receptors in multiple sclerosis pathogenesis**
 Domercq, M.; Zabala, A.; Matute, C.
Brain Research Bulletin (Sep-01) DOI: 10.1016/j.brainresbull.2018.11.018
14. **Astroglial Ca²⁺ signals trigger pathological behaviour in optogenetic mouse**
 Verkhatsky, A.; Semyanov, A.
Cell Calcium (Sep-01) DOI: 10.1016/j.ceca.2019.102062
15. **Acute slice preparation for electrophysiology increases spine numbers equivalently in the male and female juvenile hippocampus: a Dil labeling study**
 Trivino-Paredes, J.S.; Nahirney, P.C.; Pinar, C.; Grandes, P.; Christie, B.R.
Journal of neurophysiology (Sep-01) DOI: 10.1152/jn.00332.2019
16. **Perspective: Of Mice and Men – How Widespread Is Adult Neurogenesis?**
 Petrik, David; Encinas, Juan M.
Frontiers in Neuroscience (Aug-29) DOI: 10.3389/fnins.2019.00923
17. **Reactive Disruption of the Hippocampal Neurogenic Niche After Induction of Seizures by Injection of Kainic Acid in the Amygdala**
 Muro-García, Teresa; Martín-Suárez, Soraya; Espinosa, Nelson; Valcárcel-Martín, Roberto; Marinas, Ainhoa; Zaldumbide, Laura; Galbarriatu, Lara; Sierra, Amanda; Fuentealba, Pablo; Encinas, Juan Manuel
Frontiers in Cell and Developmental Biology (Aug-20) DOI: 10.3389/fcell.2019.00158
18. **CB1 Receptors in the Anterior Piriform Cortex Control Odor Preference Memory**
 Terral, G.; Busquets-García, A.; Varilh, M.; Achicallende, S.; Cannich, A.; Bellocchio, L.; Bonilla-Del Río, I.; Massa, F.; Puente, N.; Soria-Gomez, E.; Grandes, P.; Ferreira, G.; Marsicano, G.
Current Biology (Aug-05) DOI: 10.1016/j.cub.2019.06.041
19. **Targeting P2X₄ and P2X₇ receptors in multiple sclerosis**
 Domercq, Maria; Matute, C
Current Opinion in Pharmacology (Aug-01) DOI: 10.1016/j.coph.2019.03.010
20. **Phenotypical and functional heterogeneity of neural stem cells in the aged hippocampus**
 Martín-Suárez, Soraya; Valero, Jorge; Muro-García, Teresa; Encinas, Juan Manuel
Aging Cell (Aug-01) DOI: 10.1111/accel.12958
21. **Astrocyte Specific Remodeling of Plasmalemmal Cholesterol Composition by Ketamine Indicates a New Mechanism of Antidepressant Action**
 Lasi, Eva; Lisjak, Marjeta; Horvat, Anemari; Bojic, Milica; Jakanovic, Aleksandra; Anderluh, Gregor; Verkhatsky, Alexei; Vardjan, Nina; Jorgajevski, Jernej; Stenovec, Matja; Zorec, Robert
Scientific Reports (Jul-29) DOI: 10.1038/s41598-019-47459-z
22. **Sleep Disturbance in Bipolar Disorder: Neuroglia and Circadian Rhythms**
 Steardo, Luca Jr; de Filippis, Renato; Carbone, Elvira Anna; Segura-Garcia, Cristina; Verkhatsky, Alexei; De Fazio, Pasquale
Frontiers in Psychiatry (Jul-18) DOI: 10.3389/fpsyt.2019.00501
23. **Endocannabinoid Long-Term Depression Revealed at Medial Perforant Path Excitatory Synapses in the Dentate Gyrus**
 Peñasco, Sara; Rico-Barrio, Irantzu; Puente, Nagore; Gómez-Urquijo, Sonia María; Fontaine, Christine J.; Egaña-Huguet, Jon; Achicallende, Svein; Ramos, Almudena; Reguero, Leire; Elezgarai, Izaskun; Nahirney, Patrick C.; Christie, Brian R.; Grandes, Pedro
Neuropharmacology (Jul-15) DOI: 10.1016/j.neuropharm.2019.04.020
24. **Astrocytic p38 MAPK drives NMDA receptor-dependent long-term depression and modulates long-term memory**

- Navarrete, Marta; Cuartero, María I.; Palenzuela, Rocío; Draffin, Jonathan E.; Konomi, Ainoa; Serra, Irene; Colié, Sandra; Castaño-Castaño, Sergio; Hasan, Mazahir T.; Nebreda, Ángel R.; Esteban, José A.
Nature Communications (Jul-04) DOI: 10.1038/s41467-019-10830-9
25. **A Fear Memory Engram and Its Plasticity in the Hypothalamic Oxytocin System**
 Hasan, Mazahir T.; Althammer, Ferdinand; Gouveia, Miriam Silva da; Goyon, Stephanie; Eliava, Marina; Lefevre, Arthur; Kerspern, Damien; Schimmer, Jonas; Raftogianni, Androniki; Wahis, Jerome; Knobloch-Bollmann, H. Sophie; Tang, Yan; Liu, Xinying; Jain, Apar; Chavant, Virginie; Goumon, Yannick; Weislogel, Jan-Marek; Hurlemann, René; Herpertz, Sabine C.; Pitzer, Claudia; Darbon, Pascal; Dogbevia, Godwin K.; Bertocchi, Ilaria; Larkum, Matthew E.; Sprengel, Rolf; Bading, Hilmar; Charlet, Alexandre; Grinevich, Valery
Neuron (Jul-03) DOI: 10.1016/j.neuron.2019.04.029
26. **(Review) Astroglial Calcium Signaling in Aging and Alzheimer's Disease**
 Verkhratsky, A.
Cold Spring Harbor perspectives in biology (Jul-01) DOI: 10.1101/cshperspect.a035188
27. **Circadian glucocorticoid oscillations preserve a population of adult hippocampal neural stem cells in the aging brain**
 Schouten, M.; Bielefeld, P.; Garcia-Corzo, L.; Passchier, E. M. J.; Gradari, S.; Jungenitz, T.; Pons-Espinal, M.; Gebara, E.; Martín-Suárez, S.; Lucassen, P. J.; Vries, H. E. De; Trejo, J. L.; Schwarzacher, S. W.; Tonelli, D. De Pietri; Toni, N.; Mira, H.; Encinas, J. M.; Fitzsimons, C. P.
Molecular Psychiatry (Jun-20) DOI: 10.1038/s41380-019-0440-2
28. **Exercise Benefits in Pulmonary Hypertension**
 Santos-Lozano, A.; Fiuza-Luces, C.; Fernández-Moreno, D.; Llaverro, F.; Arenas, J.; López, J.A.; Vázquez, J.; Escribano-Subías, P.; Zugaza, J.L.; Lucia, A.
Journal of the American College of Cardiology (Jun-11) DOI: 10.1016/j.jacc.2019.03.489
29. **Exome sequencing in multiple sclerosis families identifies 12 candidate genes and nominates biological pathways for the genesis of disease**
 Vilariño-Güell, Carles; Zimprich, Alexander; Martinelli-Boneschi, Filippo; Herculano, Bruno; Wang, Zhe; Matesanz, Fuencisla; Urcelay, Elena; Vandenbroeck, Koen; Leyva, Laura; Gris, Denis; Massaad, Charbel; Quandt, Jacqueline A.; Traboulsee, Anthony L.; Encarnacion, Mary; Bernal, Cecily Q.; Follett, Jordan; Yee, Irene M.; Criscuoli, Maria G.; Deutschländer, Angela; Reinthaler, Eva M.; Zrzavy, Tobias; Mascia, Elisabetta; Zauli, Andrea; Esposito, Federica; Alcina, Antonio; Izquierdo, Guillermo; Espino-Paisán, Laura; Mena, Jorge; Antigüedad, Alfredo; Urbaneja-Romero, Patricia; Ortega-Pinazo, Jesús; Song, Weihong; Sadovnick, A. Dessa
PLOS Genetics (Jun-06) DOI: 10.1371/journal.pgen.1008180
30. **A oligomers promote oligodendrocyte differentiation and maturation via integrin 1 and Fyn kinase signaling**
 Quintela-López, Tania; Ortiz-Sanz, Carolina; Serrano-Regal, Mari Paz; Gaminde-Blasco, Adhara; Valero, Jorge; Baleriola, Jimena; Sánchez-Gómez, Maria Victoria; Matute, Carlos; Alberdi, Elena
Cell Death & Disease (Jun-06) DOI: 10.1038/s41419-019-1636-8
31. **BDNF and NT3 Reprogram Human Ectomesenchymal Dental Pulp Stem Cells to Neurogenic and Gliogenic Neural Crest Progenitors Cultured in Serum-Free Medium | Cell Physiol Biochem**
 Luzuriaga, Jon; Pineda, Jose Ramon; Irastorza, Igor; Uribe-Etxebarria, Veronica; García-Gallastegui, Patricia; Encinas, Juan Manuel; Chamero, Pablo; Unda, Fernando; Ibarretxe, Gaskon
Cellular Physiology & Biochemistry (May-11) DOI: 10.33594/0000000096
32. **Calcium Microdomain Formation at the Perisynaptic Cradle Due to NCX Reversal: A Computational Study**
 Wade, John Joseph; Breslin, Kevin; Wong-Lin, KongFatt; Harkin, Jim; Flanagan,

- Bronac; Van Zalinge, Harm; Hall, Steve; Dallas, Mark; Bithell, Angela; Verkhatsky, Alexei; McDaid, Liam
Frontiers in Cellular Neuroscience (May-07) DOI: 10.3389/fncel.2019.00185
33. **Persistent Na⁺ influx drives L-type channel resting Ca²⁺ entry in rat melanotrophs**
 Kayano, Tomohiko; Sasaki, Yuto; Kitamura, Naoki; Harayama, Nobuya; Moriya, Taiki; Dayanithi, Govindan; Verkhatsky, Alexei; Shibuya, Izumi
Cell Calcium (May-01) DOI: 10.1016/j.ceca.2019.02.001
34. **Human Dental Pulp Stem Cells Grown in Neurogenic Media Differentiate Into Endothelial Cells and Promote Neovasclogenesis in the Mouse Brain**
 Luzuriaga, Jon; Pastor-Alonso, Oier; Encinas, Juan Manuel; Unda, Fernando; Ibarretxe, Gaskon; Pineda, Jose Ramon
Frontiers in Physiology (Mar-28) DOI: 10.3389/fphys.2019.00347
35. **The motivation for exercise over palatable food is dictated by cannabinoid type-1 receptors**
 Muguruza, Carolina; Redon, Bastien; Fois, Giulia R.; Hurel, Imane; Scocard, Amandine; Nguyen, Claire; Stevens, Christopher; Soria-Gomez, Edgar; Varilh, Marjorie; Cannich, Astrid; Daniault, Justine; Busquets-Garcia, Arnau; Pelliccia, Teresa; Caillé, Stéphanie; Georges, François; Marsicano, Giovanni; Chaouloff, Francis
JCI Insight (Mar-28) DOI: 10.1172/jci.insight.126190
36. **Epidermal growth factor receptor controls glycogen phosphorylase in T cells through small GTPases of the RAS family.**
 Llaveró, Francisco; Montoro, Miriam Luque; Sastre, Alazne Arrazola; Fernández-Moreno, David; Lacerda, Hadriano M.; Parada, Luis A.; Lucia, Alejandro; Zugaza, José L.
Journal of Biological Chemistry (Mar-22) DOI: 10.1074/jbc.RA118.005997
37. **(Editorial) Glia in Health and Disease**
 Ho, Margaret Su-chun; Verkhatsky, Alexei; Duan, Shumin; Parpura, Vladimir
Frontiers in Molecular Neuroscience (Mar-19) DOI: 10.3389/fnmol.2019.00063
38. **Aging | GABAergic astrocytes in Alzheimer's disease**
 Garaschuk, O.; Verkhatsky, A.
Aging (Mar-15) DOI: 10.18632/aging.101870
39. **Transcranial direct-current stimulation (tDCS) improves detection of simple bright stimuli by amblyopic Long Evans rats in the SLAG task and produces an increase of parvalbumin labelled cells in visual cortices**
 Castaño-Castaño, S.; Martínez-Navarrete, G.; Morales-Navas, M.; Fernández-Jover, E.; Sanchez-Santed, F.; Nieto-Escámez, F.
Brain Research (Mar-07) DOI: 10.1016/j.brainres.2018.09.039
40. **Rewiring of memory circuits: connecting adult newborn neurons with the help of microglia**
 Rodríguez-Iglesias, Noelia; Sierra, Amanda; Valero, Jorge
Frontiers in Cell and Developmental Biology (Mar-05) DOI: 10.3389/fcell.2019.00024
41. **Adolescent ethanol intake alters cannabinoid type-1 receptor localization in astrocytes of the adult mouse hippocampus**
 Bonilla-Del R o, Itziar; Puente, Nagore; Peñasco, Sara; Rico, Irantzu; Gutiérrez-Rodríguez, Ana; Elezgarai, Izaskun; Ramos, Almudena; Reguero, Leire; Gerrikagoitia, Inmaculada; Christie, Brian R.; Nahirney, Patrick; Grandes, Pedro
Addiction Biology (Mar-01) DOI: 10.1111/adb.12585
42. **APP depletion alters selective pre- and post-synaptic proteins**
 Martinsson, Isak; Capetillo-Zarate, Estibaliz; Faideau, Mathilde; Willén, Katarina; Esteras, Noemi; Frykman, Susanne; Tjernberg, Lars O.; Gouras, Gunnar R.
Molecular and Cellular Neuroscience (Mar-01) DOI: 10.1016/j.mcn.2019.02.003
43. **Co-administration of Anti microRNA-124 and -137 Oligonucleotides Prevents Hippocampal Neural Stem Cell Loss Upon Non-convulsive Seizures.**
 Bielefeld, Pascal; Schouten, Marijn; Meijer, Guido Thomas; Breuk, Marit Johanna; Geijtenbeek, Karlijne W.; Karayel, Sedef; Tiaglik, Alisa; Vuuregge, Anneke; Willems, Ruth Anne Laura; Witkamp, Diede; Lucassen, Paul; Encinas, Juan Manuel; Fitzsimons,

- Carlos P.
Frontiers in Molecular Neuroscience (Feb-19) DOI: 10.3389/fnmol.2019.00031
44. **Glutamate receptors and white matter stroke**
 Fern, Robert; Matute, Carlos
Neuroscience Letters (Feb-16) DOI: 10.1016/j.neulet.2018.11.031
45. (Review) **Ionic signalling in astroglia beyond calcium**
 Verkhatsky, A.; Untiet, V.; Rose, C.R.
Journal of Physiology (Feb-07) DOI: 10.1113/JP277478
46. **Role of astrocytes, microglia, and tanocytes in brain control of systemic metabolism**
 García-Cáceres, Cristina; Balland, Eglantine; Prevot, Vincent; Luquet, Serge; Woods, Stephen C.; Koch, Marco; Horvath, Tamas L.; Yi, Chun-Xia; Chowen, Julia A.; Verkhatsky, Alexei; Araque, Alfonso; Bechmann, Ingo; Tschöp, Matthias H.
Nature Neuroscience (Jan-22) DOI: 10.1038/s41593-018-0286-y
47. **Excitotoxicity therapy for stroke patients still alive**
 Domercq, Maria; Matute, Carlos
EBioMedicine (Jan-15) DOI: 10.1016/j.ebiom.2018.12.027
48. **Astroglial signalling in health and disease**
 Verkhatsky, A.; Zorec, R.
Neuroscience Letters (Jan-15) DOI: 10.1016/j.neulet.2018.07.026
49. **Astroglipathology in the infectious insults of the brain**
 Zorec, R.; upanc, T.A.; Verkhatsky, A.
Neuroscience Letters (Jan-15) DOI: 10.1016/j.neulet.2018.08.003
50. **Leptin increases expression of 5-HT2B receptors in astrocytes thus enhancing action of fluoxetine on the depressive behavior induced by sleep deprivation**
 Li, Xiaowei; Liang, Shanshan; Li, Zexiong; Li, Shuai; Xia, Maosheng; Verkhatsky, Alexei; Li, Baoman
Frontiers in Psychiatry (Jan-07) DOI: 10.3389/fpsyt.2018.00734

One of the establishment objectives defined by the Board of Trustees when launched ACHUCARRO was that the centre had to contribute to disseminate and transfer human knowledge, and to spread the scientific culture and literacy. We implement this strategic activity in many ways, to adapt to the needs and requirements of the different audiences.

5. Knowledge Transfer

Postgraduate education

ACHUCARRO collaborates with three Masters' programmes organized and coordinated by the University of the Basque Country (UPV/EHU):

- Neuroscience
- Molecular Biology and Biomedicine
- Pharmacology, Development, Assessment, and Rational Use of Medicines

Our personnel also coordinate the Doctorate Programme on Neurosciences, organized together with the Universities of Coruña (Galicia), Castilla – La Mancha, Pablo de Olavide (Seville), and Rovira I Virgili (Catalonia).



PhD theses

In 2019 has been a fruitful year for defending PhD projects.

Seven of our younger colleagues successfully completed their doctoral training; all of them in the *International mention*, as they completed research stays abroad during their doctorate period.

Other 37 are in different stages of that process.

- ▶ **Andrea Manterola Juaristi** | Laboratory of Neurobiology
"Therapeutic potential of the endocannabinoid system in multiple sclerosis: novel clues from oligodendrocyte CB1 receptors and ABHD6"
- ▶ **Carolina Ortiz Sanz** | Laboratory of GTPases and Neurosignaling & Laboratory of Neurobiology
"Characterizing the role of integrin $\beta 1$ in early synaptic changes and gliosis triggered by amyloid β oligomers: Implications for Alzheimer's disease progression"
- ▶ **Naiara Royo Zubillaga** | Laboratory of Ultrastructural and Functional Neuroanatomy of the Synapse
"Effects of acute and chronic restraint stress during adolescence on endocannabinoid-mediated synaptic plasticity in the mouse hippocampal dentate gyrus"
- ▶ **Víctor Sánchez Zafra** | Laboratory of Glial Cell Biology
"Microglial phagocytosis: unraveling the role of GPR34-lysoPS signaling and phagocytic microglia on metabolism and neurogenesis"
- ▶ **Maria Paz Serrano Regal** | Laboratory of Neurobiology
"Role of GABAergic signaling in oligodendroglial differentiation, myelination and remyelination after demyelinating lesions"
- ▶ **Nerea Ugidos Damboriena** | Laboratory of Neurogenomiks
"Functional analysis of ANKRD55, a multiple sclerosis risk gene with unknown function"
- ▶ **Alazne Zabala Olaizola** | Laboratory of Neurobiology
"Purinergic P2X4 receptors modulate neuroinflammation and repair in experimental multiple sclerosis"

**Congratulations Andrea, Carolina, Naiara,
Víctor, Mari Paz, Nerea and Alazne!**

Highlights in research outcomes

Brain macrophages turn 100 years

Milestones in a century of Microglia research

In 1919, Valladolid-born researcher Pio del Río-Hortega confronted the great Ramón y Cajal, who had established that the brain had only three cell types: neurons, astrocytes, and a “third element”, amorphous, polar cells.

In spite of Cajal’s opposition, Río-Hortega demonstrated that the third element was in fact two very different cell types and was able to predict their function: oligodendrocytes, which associate to the neurons’ axons; and microglia, the brain macrophages. 100 years later, the discoveries on microglial function from development to disease, are on the rise.

New evidences are published daily showing that microglia is not only a brain macrophage involved in the inflammatory response to damage but in fact actively participate in the neuronal physiology. In the next decades, we will see novel strategies emerge to control the function of these powerful cells to heal the damaged brain.



"Cien Años de Microglía: Milestones in a Century of Microglial Research"

Sierra, Amanda; Paolicelli, Rosa C.; Kettenmann, Helmut

Trends in Neurosciences (Oct-18) DOI: 10.1016/j.tins.2019.09.004



Achucarro Seminars

January 7th

"Endothelial Dab1 Signaling Orchestrates Neuro-glia-vessel Communication in the Central Nervous System"

María Aburto

Goethe University of Frankfurt (Germany)

January 18th

"Astrocyte regulation of circadian behavior"

Olga Barca

Italian Institute of Technology (Italy)

January 25th

"Cell-penetrating peptides based on Connexin43 as potential therapies against malignant brain tumors"

Arantxa Tabernero

Institute of Neuroscience Castilla y Leon (Salamanca, Spain)

February 1st

"Post-transcriptional mechanisms in synaptic plasticity and memory consolidation: Role of mRNA stability"

Beat Lutz

German Resilience Center (Germany)

February 15th

"Modulation of Parkinson's disease LRRK2 activity and pathogenicity"

Iban Ubarretxena

Institute Biofisika [CSIC – UPV/EHU] (Leioa)

March 22nd

"Alzheimer's and Parkinson's diseases from a prion-like perspective"

José Martínez Hernández

UPV/EHU (Leioa)

March 29th

"Synaptotoxicity in Alzheimer's Disease Involved a Dysregulation of Actin Cytoskeleton Dynamics through Cofilin 1 Phosphorylation"

Alino Jose Martínez

School of Medicine at the Ciudad Real (Spain)

April 12th

"Immunometabolism and alzheimer's disease: alteration of microglial metabolic function with age and cerebral amyloidosis"

Ana Rubio Araiz

Trinity College (Ireland)

May 3rd

"Selective autophagy in the fight against neurodegeneration"

Ana Maria Cuervo

Albert Einstein College of Medicine (USA)

May 6th

"Astrocyte-Neuron Lactate Shuttle: from proof-of-concept to a major paradigm shift in neuroenergetics"

Luc Pellerin

University of Lausanne (Suisse)

May 17th

"Reading within and beyond the classical reading network: Contributions of the ventral occipitotemporal cortex and thalamic nuclei to reading processes"

Kepa Paz Alonso

BCBL (Donostia – San Sebastian)

May 24th

"Genetic evolution of cerebral cortex size determinants"

Victor Borrell

Institute of Neuroscience [CSIC-UMH] (Valencia, Spain)

May 27th

"A Single Cell-Based System To investigate Mechanisms of Neurodegeneration"

Montserrat Arrasate

CIMA - Center for Applied Medical Research (Iruña – Pamplona)

May 31st

"Super-resolution imaging of the non-canonical forms of cannabinoid signaling in the developing and adult forebrain"

Itsván Katona

Institute of Experimental Medicine - Hungarian Academy of Sciences (Hungary)

June 10th

"How experience contributes to circuit remodeling in the adult and aging hippocampus"

Alejandro Schinder

Leloir Institute [CONICET] (Argentina)

June 17th

"Neuronal circuits underlying novelty and familiarity signaling"

Susana Molas Casacuberta

University of Massachusetts Medical School (USA)

June 21st

"Molecular control of sense of touch"

Tansu Celikel

Radboud University (The Netherlands)

June 28th

"Blood brain barrier disruption in acute stroke: assessment with dynamic contrast-enhanced neuroimaging and clinical relevance"

Sergio Amaro

Clinic Hospital (Barcelona)

July 05th

"A role of Zn and Vesicular glutamate transporters in the communication between Axon and myelin"

Ileana Micu

Queen's University in Belfast (UK)

July 18th

"Optical interrogation of neurodegenerative pathologies in the live mammalian brain"

Jaime Grutzendler

Yale University (USA)

July 19th

"Niche factors compromise the metabolism of A β plaque-associated microglia"

Alberto Pascual

Institute of Biomedicine of Seville (IBIS) (Seville, Spain)

September 13th

"Role of Interleukin-37 in Neurological conditions"

Ruben Lopez Vales

Universitat Autònoma of Barcelona (Barcelona)

September 20th

"From Synchrotrons to Microwires – a broad view on sensory processing"

Andreas Schaefer

The Francis Crick Institute (UK)

October 25th

"From retinal development to drug development"

Enrique J. de la Rosa

CIB / CSIC (Madrid, Spain)

November 15th

"The role of the imbalance between aging-linked alterations and resilience mechanisms in Alzheimer's disease"

Francesc X. Guix Ràfols

CBMSO - Severo Ochoa Molecular Biology Center [CSIC] (Madrid, Spain)

November 22nd

"A Novel Oxidative Stress Detoxification Pathway that Confers Neuroprotection"

Teresa Iglesias

Autonomous University of Madrid [CSIC-UAM] (Madrid, Spain)

November 29th

"The emerging role of astrocytes in the control of metabolism"

Cristina García Cáceres

Institute for Diabetes and Obesity (Germany)

November 13th

"Advanced transgenic approaches to understand the neurobiological processes in reward-related brain diseases: a therapeutic perspective"

Ainhua Bilbao Leis

Central Institute of Mental Health (Germany)

November 19th

"Translational research in Parkinson's disease"

M^aCruz Rodríguez Oroz

Clinica Universitaria Navarra & CIMA (Iruña - Pamplona)

Congresses and Scientific Meetings

Our colleague Juan Manuel Encinas is the Scientific Coordinator of this scientific meeting

DRAVET SYNDROME AND EPILEPSY REFRACTORY MEETING

Together with ApoyoDravet, a regional association of Dravet Syndrome we organised the first edition of the “*International Congress on Dravet Syndrome and Refractory Epilepsy*”, held in Bilbao, on October 4 and 5.

Our main objective of this meeting, and specifically of this edition was to contribute to the dissemination and transfer of knowledge and technologies related to Dravet syndrome and refractory epilepsy diseases.



<http://www.apoyodravet.eu>

Achucarro Forum

The Achucarro Forum conference series is an initiative aimed at communicating, disseminating and fostering social awareness about the importance of research about the brain and its diseases.

These conferences are broadcasted via streaming by the Basque Public Television Corporation (EITB), thanks to our partnerships with the Chair of Scientific Culture of the UPV/EHU.

In 2019, we hosted these talks:



Ana María Cuervo
Albert Einstein College of Medicine
New York, USA

"Limpieza celular: esencial para prevenir las enfermedades cerebrales relacionadas con la edad"

May 2nd
Bizkaia Aretoa



Enrique J. de la Rosa Cano
Centro de Biología Molecular (CBM-CSIC)
Madrid, Spain

"Distrofias hereditarias de la retina: Conocerlas para curarlas"

October 24th
Bizkaia Aretoa

<https://www.achucarro.org/achucarro-forum/>

Highlights in dissemination and advocacy

Outreach and advocacy

ACHUCARRO has a strong commitment with sustainability and social responsibility.

Our main activity is directed to face social challenges, but strive to go beyond, and make the most of our capabilities and our collaboration networks for contributing to develop a more sustainable and advanced Society.

Therefore, we deploy our commitment with Equality, Talent development, Awareness about the importance of Science and advancing in an informed society, both with internal policies and external actions.

INTERNATIONAL DAY OF WOMEN AND GIRLS IN SCIENCE

The United Nations (UN) organisation declared (resolution A/RES/70/212; 2016) February 11 as the **International day of women and girls in science**. ACHUCARRO caught up the idea and pioneered organising the first awareness event in Bilbao in 2017.

ACHUCARRO changed the approaches over the time, about the activities to develop to celebrate this day, and among other in 2019 many of our researchers went to schools to explain their work, advocate scientific research and to try to increase the awareness about the research career.



Francisco Llaveró at "El Regato" school



Paula Ramos at "Colegio San Viator"



Sol Beccari, Virginia Sierra and Mar Marquez at "Koldo Mitxelena" high school

<http://www.un.org/en/events/women-and-girls-in-science-day>

The Science Park of the UPV/EHU in Leioa (metropolitan area of Bilbao), hosts the headquarters of ACHUCARRO, inaugurated in June 2017.

6. Infrastructure and Equipment

The proximity with Bilbao, and its airport, and the faculties of the University with the degrees (Biology, Biochemistry, Medicine...) that give access to research work in neurobiology is an asset that allowed us to expand our potential.

ACHUCARRO currently occupies the third floor of the Sede building, a space of 2000 m² in a privileged location within the campus of the UPV/EHU. Additionally, some of the research groups have laboratories and office spaces in the Faculty of Medicine and Nursing, at 400 metres from the main location.



With the advantage of this location in the campus, where the general facilities (microscopy, genomics, proteomics, etc.) for research support of the university are located, our strategy was to complement the existing resources with the specific ones of our field and those that provide an added value or competitive advantage, like the resources for performing:

- Cell cultures:
 - Primary and organotypic cultures, and human inducible pluripotent stem cells
- Flow Cytometry and Fluorescence-activated Cell Sorting
- Functional Genomics:
 - Reporter constructs, and Recombinant expression
- Genotyping
- qPCR and qRT-PCR
- Stereotaxic Surgery
- Immunofluorescence, Immunocytochemistry, and Immunohistochemistry
- Optical microscopy:
 - Epifluorescence, Confocal with STED super-resolution, Calcium Imaging and Two-photon microscopy, Slide scanning and High-content Screening (HCS) Platform
- Classical morphometry and stereology
- Advanced image analysis:
 - Deconvolution and HCS platforms, and In-house developed software
- Protein detection:
 - Western blotting, ELISA, and SIMOA - Single MOlecule Array technology
- Electrophysiology

<https://www.achucarro.org/facilities>

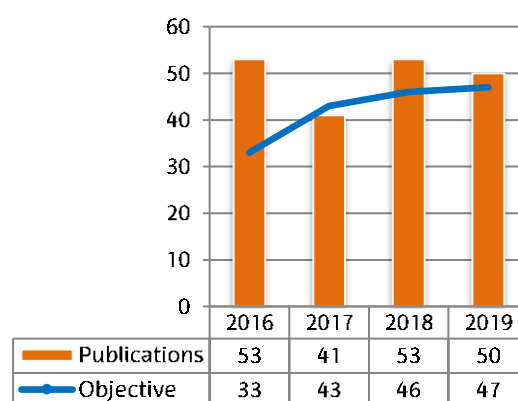
7. Main performance indicators

The Basque Government set challenging objectives to a set of performance indicators aligned the Basque Science strategy established by the Ikerbasque Foundation. The following indicators show the progression of ACHUCARRO in panel of objectives set by our Trustees, funders and by ourselves.

Indicator 1

Total number of indexed publications

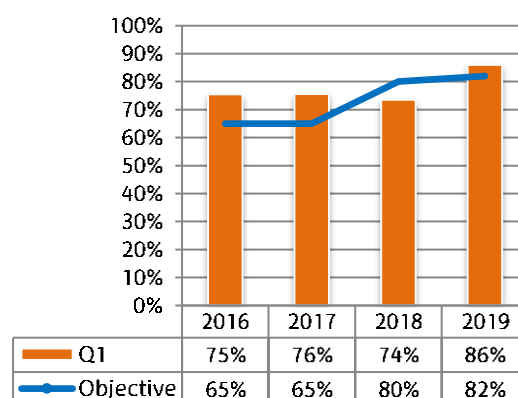
Sources:
Scopus and Web of Science



Indicator 2

% of publications in quartile 1 of their research areas

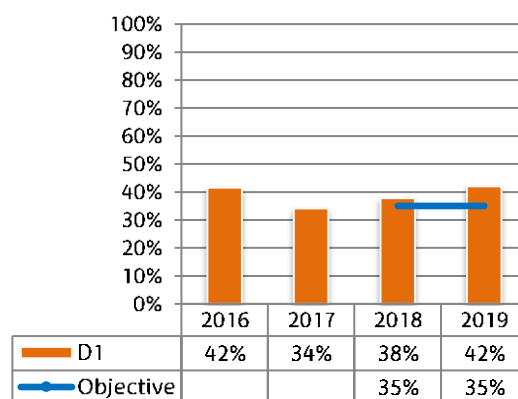
Source:
Scimago Journal Ranking



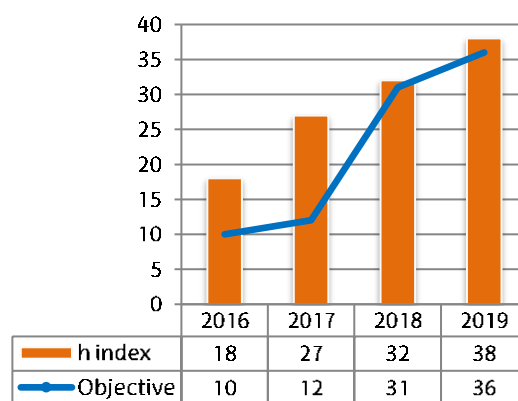
Indicator 3

% of publications in decile 1 of their research areas

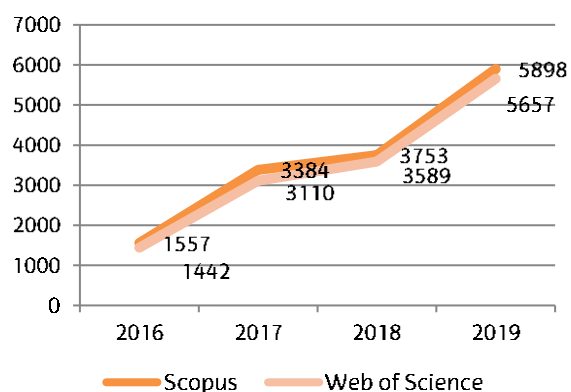
Source:
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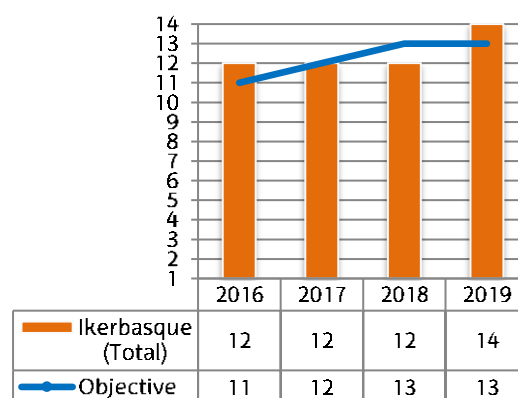
Indicator 4

*h-index for ACHUCARRO*Source:
Scopus and Web of Science

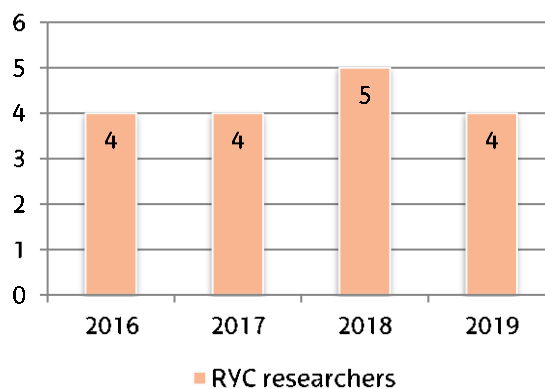
Indicator 5

*Total number cites, excluding self-citation*Source:
Scopus and Web of Science

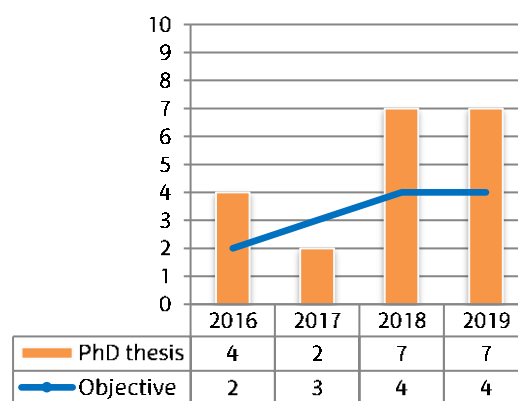
Indicator 6

*Total number of Ikerbasque Researchers (Professors, Associated and Fellows)*Source:
Internal

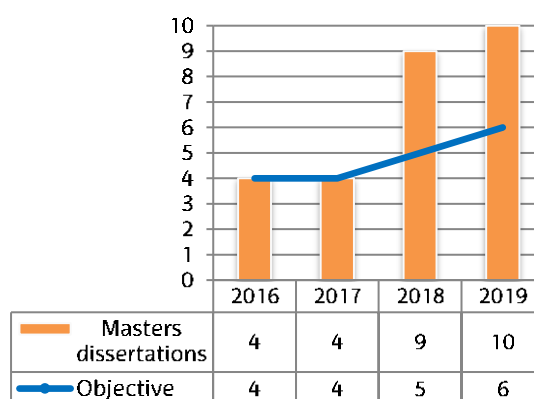
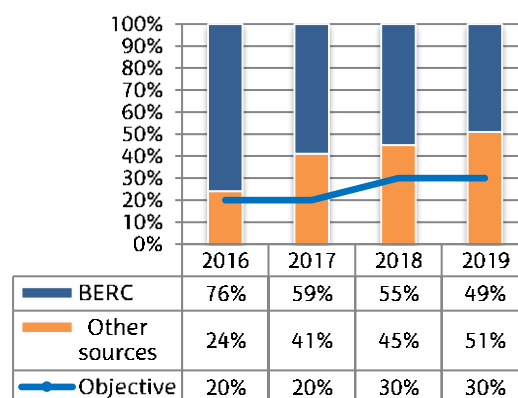
Indicator 7

*Total number of Ramón y Cajal Fellows*Source:
Internal

Indicator 8

*Completed
PhD Thesis*Source:
Internal

Indicator 9

*Completed
Masters' Dissertations*Source:
InternalIndicator 10
*% of funding
different from BERC*Source:
Internal



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