Scotland's Healthy Ageing Innovation Cluster

Wednesday 01 December 2021, 1000-1200

Part of

2021 Digital Health & Care Fest

Digital Health & Care Innovation Centre

ECHAlliance

enterprise europe network

DIGITAL OFFICE
Scottish Local Government

HIE
Highlands and Islands Enterprise
Iomairt na Gàidhealtachd 's nan Eilean

Scottish Enterprise

TEC Technology Enabled Care

Attendees please note

1. We are recording this event and it will be hosted on our HAIC webpage resources so it can be watched on demand
2. If you do not wish to appear on the recording, you should keep your camera and microphone turned off for the duration of the event
3. As a courtesy to our speakers and guests, we ask all attendees to turn their microphones and cameras off during presentations
4. If you have questions for our speakers, please add them into the chat field or wait until the Q and A session, where they will be answered

Today’s event

Joanne Boyle, Digital Health & Care Innovation Centre

Agenda

- 1000 - Spain Landscape and Introduction - **Sergio Muñoz and Joanne Boyle**
- 1010 - Funding opportunities in Spain - **Óscar González**
- 1025 - ITEMAS Clinical Ecosystem - **Mabel Sampedro**
- 1040 - SEIB R+D Ecosystem - **Enrique J. Gómez**
- 1055 - Gipuzkoa Ecosystem for Digital Health entrepreneurs - **Esther Paguey & Eduardo Jauregui**
- 1110 - Innovation in Digital Health and Healthy Aging in Madrid - **Ana Miquel**
- 1125 - Introduction to Information Processing and Telecommunications Center - **Rubén San Segundo**
- 1140 - Q&A and discussion
- 1200 - Event concludes

An Introduction to Scotland's Healthy Ageing Innovation Cluster

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TEC

Spain Landscape and Introduction

Sergio Muñoz, Head of Innovation, Digital Health and Emerging Technologies (Fenin)

Digital Health & Care Innovation Centre

Funding opportunities in Spain

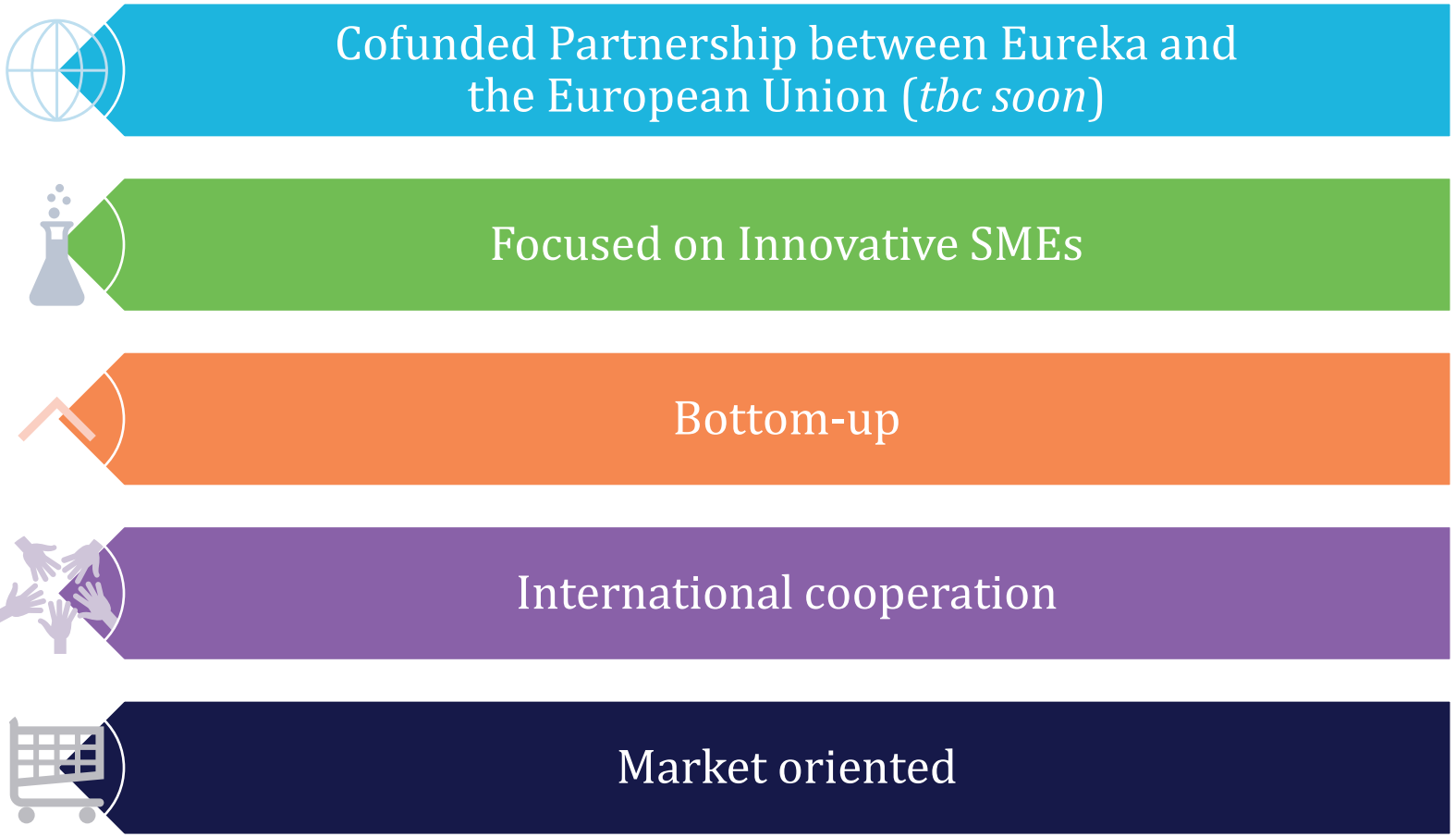
Óscar González – Eurostars National Project Coordinator (CDTI)

Introduction and novelties of Eurostars-3

Oscar Gonzalez
Eurostars National Project Coordinator – CDTI - Spain
1/12/2021

https://www.eurekanetwork.org/countries/spain/eurostars/

Eurostars is



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Some highlights of Eurostars-3

37 participating countries in Europe and beyond

2021-2027

2 calls for proposals per year (March & September)

Centralized evaluation, decentralized funding with GRANTS (about 50% of project costs)

Around 25% success rate

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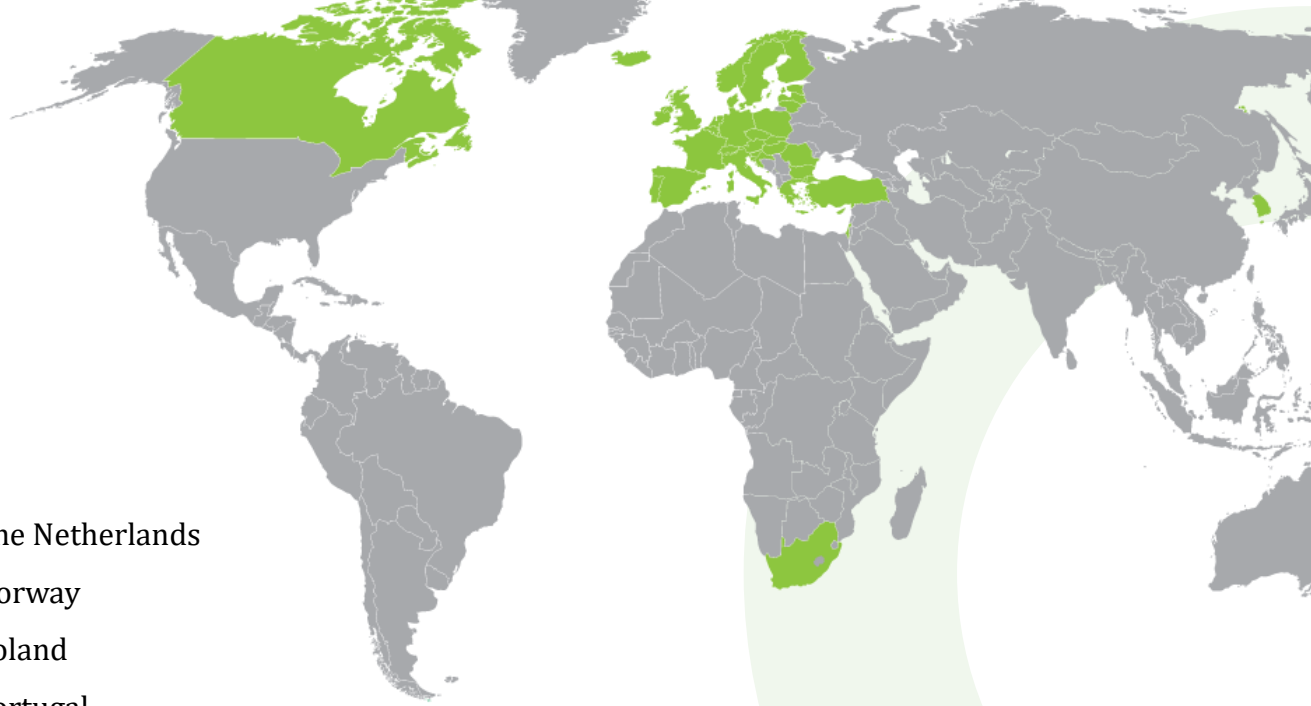
37 Eurostars countries



- Austria
- Bulgaria
- Belgium
- Canada
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Israel
- Italy
- Latvia
- Lithuania
- Luxembourg
- Malta
- The Netherlands
- Norway
- Poland
- Portugal
- Romania
- Slovak Republic
- Slovenia
- South Africa
- South Korea
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom
- **Singapore**

New country in Eurostars-3!

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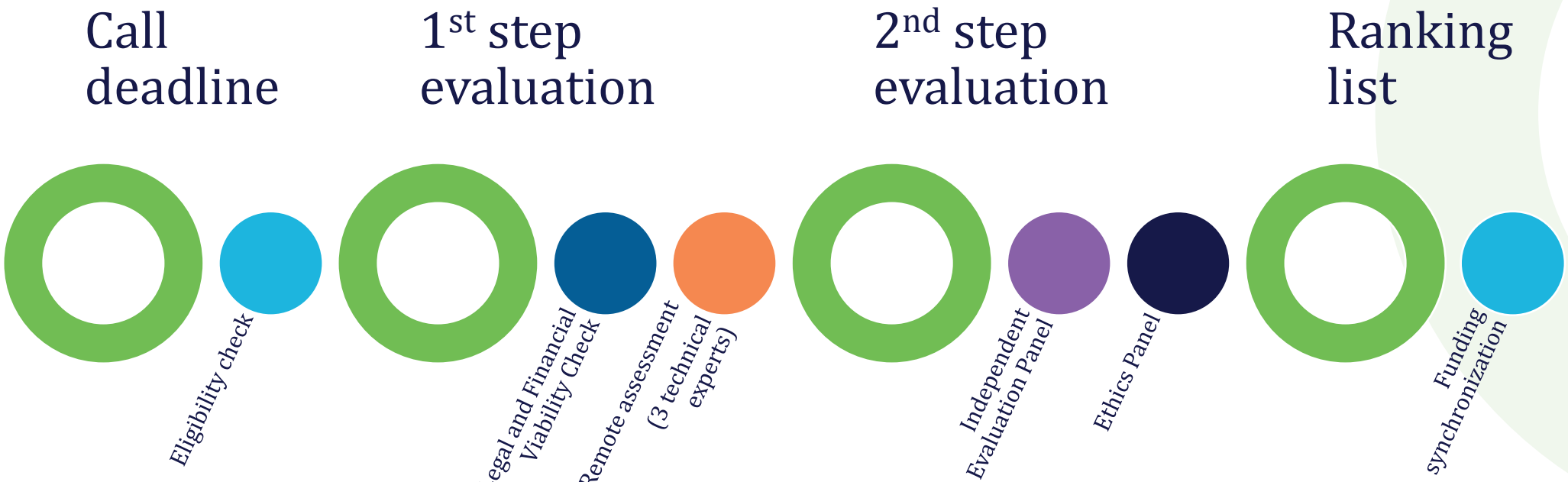
Eurostars-3 evaluation process



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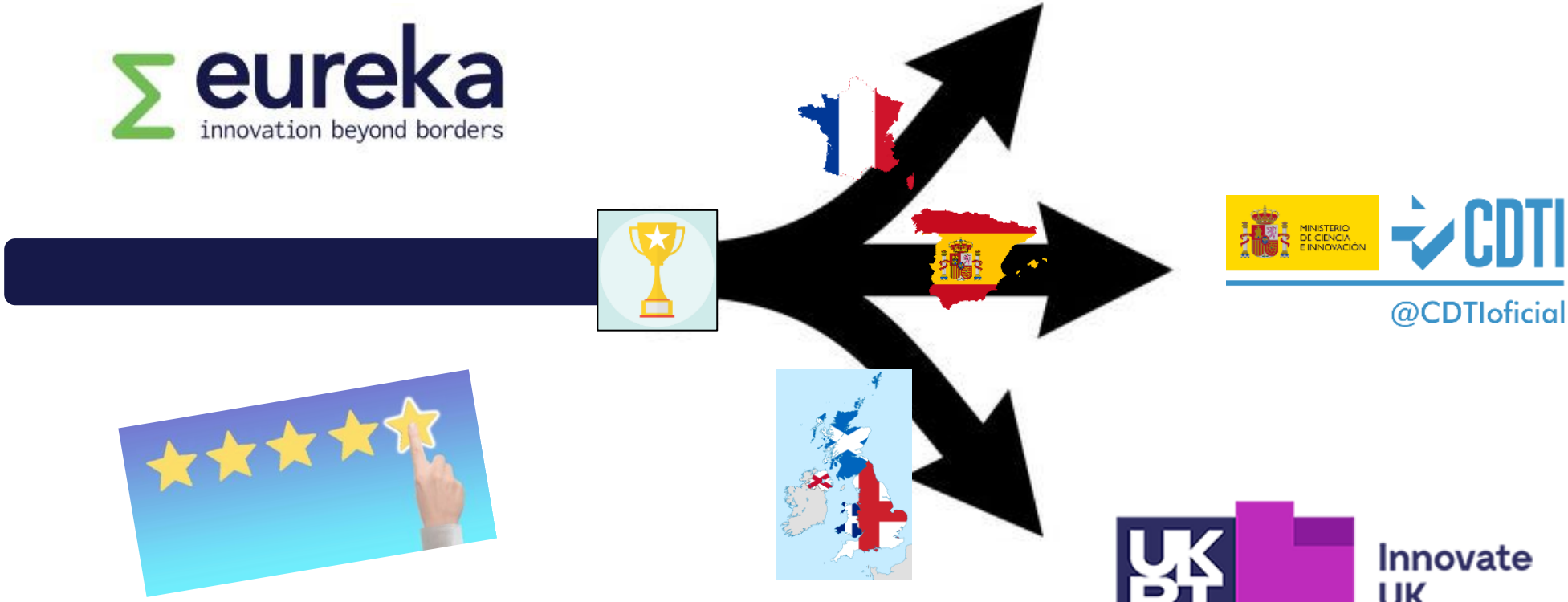
Centralized evaluation – Decentralized funding



Eligibility criteria

The project is led by an **innovative SME*** from a Eurostars country.

≥50%

The budget of the **SMEs** from Eurostars countries (excluding subcontracting) must be at least 50% of the total project budget.

The consortium includes at least two entities that are independent of one another.

≤70%

No single participant or country is responsible for more than **70%** of the total project budget.

The project involves at least two Eurostars countries, with at least one being an EU or Horizon Europe Associated country.**

**All except for Canada, Republic of Korea, Singapore, South Africa, and Switzerland.

The project duration is 36 months or less.

The project has an exclusively civilian purpose.

Target group of Eurostars-3:
From R&D Performing SMEs to **innovative SMEs**:

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Evaluation criteria

Quality and efficiency if the implementation

- Quality of the consortium
- Added value through cooperation
- Realistic and clearly defined project management and planning
- Reasonable cost structure

Excellence in innovation

- Degree of innovation
- New applied knowledge
- Level of technical challenge
- Technical achievability and risk

Market and Impact

- Market size
- Market access and risk
- Competitive advantage
- Clear and realistic commercialisation plans
- Economic, environmental and societal impact

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Application form

5 sections:

PROJECT DETAILS	APPLICATION	YOUR ORGANISATION	DECLARATIONS	WORK PACKAGES
Provide a summary of your project (participants, purpose, revenue generated). Indicate any individuals or entities you want to exclude from evaluating your application.	**Impact:** results, business case, commercialisation, market analysis, SDG-related impact.* **Excellence:** scientific method (including gender dimension**) and degree of innovation, technical state of the art, technical risks. **Quality and efficiency of the implementation:** main partner's management experience, benefits of collaboration, IPR. **Ethics** self-assessment.	**Partner-specific section**: project costs, financial information, funding requested, core business and expertise, contribution to the project, benefits of the participation, financial situation and how you intend to finance your participation.	• **SME declaration** (only SMEs) • **Commitment and signature form** (each partner)	**Describe each work package in detail** (milestones and outcomes, go/no-go decision points, tasks, costs, etc.). Upload Gantt chart and/or technical annex, if relevant.

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Sustainable development goals

- Does the resulting product, process or service address a specific set of SDGs and targets?
- What problem(s) will your project results help tackle? How could they be a solution to the problem(s)? Who will benefit from them?
- What might the short-term and long-term outcomes of the new product, process or service be?
- Use existing evidence and indicators to substantiate your statements.

State if your project or project results will have any negative social and/or environmental effects. Describe what risks you have identified and how you plan to mitigate them. If your project has no risks, state this in the text box.

Resources:

- **Goals, targets and indicators: https://sdgs.un.org/goals**
- **2019 UN Global Compact "Framework for Breakthrough Impact on the SDGs through Innovation"**
- **Project Breakthrough https://breakthrough.unglobalcompact.org/ (how technologies can impact the SDGs, field-specific examples)**

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Gender dimension

Explain how you have integrated a gender dimension into your scientific methodology. If you consider gender dimension as non-relevant for the R&D content of your application, explain why.

Gender dimension

The integration of sex, gender and intersectional analysis into research and innovation

Resources:

- **Report "Gendered Innovations 2" - General methods and field-specific methods + series of case studies on how to integrate gender dimension.**
- **Website Gendered innovation**

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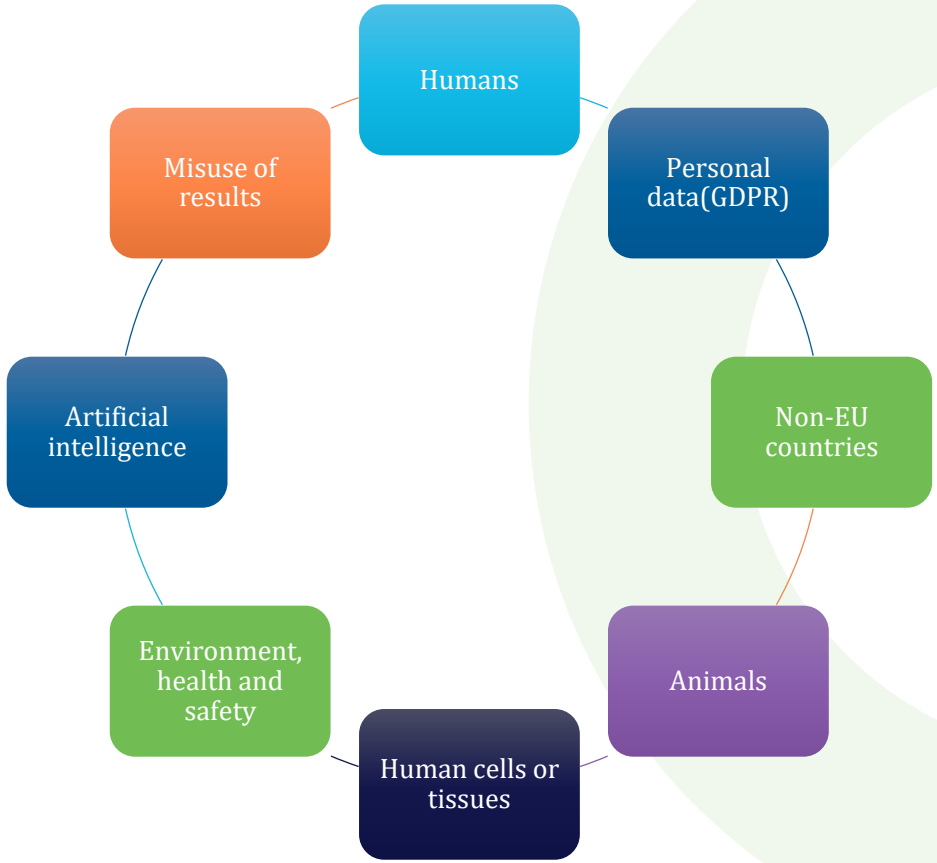
Ethics Appraisal

- The Ethics Appraisal runs in parallel to the IEP, and it is performed for all projects progressing to the 2nd step of the evaluation.
- A group of experts meet to discuss to possible **ethical implications** of the applications and decide on whether these are **sufficiently mitigated in the project proposal**.
- Outcome: a list of recommendations to tackle potential ethics issues, and a possible Ethics Check date during the implementation of the project.
- Suggestions: Use the **Ethics Self-assessment** in the application form to get ahead of the evaluators.



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Advice for a good Eurostars-3 application

To establish a good, complementary consortium

- Dedicate time to find the right partners, showing added value of the cooperation during and after the project.
- Do not take into account only the technical aspects, but also the financial situation and the capacity to bring products to the market.

To have an ambitious but realistic project

- Make sure that the methodology used in the project is aligned with the capacity of the partners, the budget and time dedicate to research and commercialization.
- Define clear objectives and KPIs from the technical, financial and commercial point of view.
- Experts evaluating the proposal should have a clear idea of what, how and why you are going to do

To not forget about the commercial aspect

- In many occasions, the commercial aspects is the weakest of all three in Eurostars-3 applications. Make sure you consider:
  - -Exploitation plan and commercialization strategy.
  - -Competitors' analysis and technologies currently in the market.
  - -Entry barriers.
  - -Competitive advantage of your product.
  - -Risk analysis and quantification

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Next calls of Eurostars-3

- 2022:
  - 24/03/2022
  - 15/09/2022
  - Two calls (March and September) until 2027

  https://www.eurekanetwork.org/countries/spain/eurostars/apply

- The Eureka Secretariat and the National Funding Bodies will organise information webinars for applicants.

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innovation beyond borders

Thank you for your attention

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ITEMAS Clinical Ecosystem

Mabel Sampedro, Officer of Transfer & Innovation (Fundación Instituto de Investigación Sanitaria de Santiago de Compostela)

ITEMAS – ISCIII
Platform for Dynamization and Innovation of the industrial capacities of the SNS and their effective transfer to the productive sector

October 2021

www.itemas.org

Life Sciencies 2013: Top US universities and institutes

Table 1 US universities[a] ranked by licenses executed, together with licensing revenue, life science startups and US National Institutes of Health (NIH) awards and funding.

University	Licenses and/or options executed	Gross licensing revenue received	Startups	NIH awards[b]	NIH funding[b]
University of California system	236	$97,218,208	55	4,239	$1,741,730,393
University of Washington/Washington Research Foundation	134	$47,428,701	9	932	$454,274,167
Columbia University	55	$137,000,000	6	860	$348,146,222
University of Minnesota	48	$34,400,000	9	608	$264,302,067
New York University	29	$213,137,273	5	612	$220,178,414
Wake Forest University	23	$2,206,625	4	242	$101,760,292
Northwestern University	22	$256,163,456	3	593	$233,095,315
University of Rochester	8	$27,139,128	0	382	$146,849,347
University of Massachusetts	7	$32,624,826	1	392	$158,659,306
Princeton University	4	$130,000,000	1	117	$39,609,228

[a]Massachusetts Institute of Technology, Stanford University, University of Wisconsin–Madison and the University of Texas system also ranked highly in gross licensing revenue but could not provide information specific to life sciences. [b]NIH data shown for fiscal year 2013. Source: Association of University Technology Managers, university technology transfer offices, NIH.

Table 2 US biomedical research institutes ranked by licenses executed, together with revenue, startups and US National Institutes of Health (NIH) awards and funding in 2013.

Research institute	Licenses and/or options executed	Gross licensing revenue received	Startups	NIH awards[a]	NIH funding[a]
Massachusetts General Hospital	111	$75,897,375	14	788	$339,490,480
Mayo Foundation for Medical Education and Research	86	$27,778,237	5	376	$192,248,756
Brigham & Women's Hospital	51	$8,015,833	5	576	$315,919,592
Memorial Sloan Kettering Cancer Center	43	$148,457,432	2	241	$111,289,141
Cleveland Clinic	38	$11,945,033	5	203	$82,188,005
Boston Children's Hospital	35	$9,577,933	2	303	$126,812,298
Fred Hutchinson Cancer Research Center	18	$10,684,882	0	269	$199,131,915
City of Hope and Beckman Research Institute	11	$249,371,883	2	85	$36,942,940
Wistar Institute	6	$19,285,000	0	55	$25,344,586
Cedars-Sinai Medical Center	6	$12,122,483	1	71	$27,956,249

[a]NIH data shown for fiscal year 2013. Source: Association of University Technology Managers, university technology transfer offices, NIH.

Huggett B. Nature Biotechnology Vol 32 November 2014

Origin of ITEMAS

Network: Innovation in medical and health technologies

2010-2013

Coordinator:
Dr. Manuel Desco

PT13: Innovation in medical and health technologies

2014-2017

Coordinator:
Dr. Manuel Desco

PT17: Innovation in medical and health technologies

2018-2020

Coordinator:
Dr. Galo Peralta

PT20: Dynamization and innovation of the industrial capacities of the SNS

2021-2023

Coordinator:
Dr. Lluís Blanch

1 Network and 2 platforms prior to the PT20

Plataforma ISCIII de Dinamización e innovación de las capacidades industriales del SNS y su transferencia efectiva al sector productivo (ITEMAS) (PT20/00081) financiada por el Instituto de Salud Carlos III. Proyecto cofinanciado con el Fondo Europeo de Desarrollo Regional (FEDER).

Origin of ITEMAS

1 NETWORK and 2 PLATFORMS prior to the new PT20

They have achieved:

- Generate a stable network of innovation in the Spanish health centers.
- Intensive dedication to promoting innovation, setting up good practice guides that would allow progress towards the systematization of models, creation of forums for the exchange of experiences and positioning of innovation as a means of generating wealth.
- Create an ecosystem of companies, technology centers, hospitals, etc.

But it has not been achieved:

- High impact on technology transfer to the productive sector.
- High impact on the transfer to the National Health System (SNS)

A need arises from the SNS

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Need from the SNS

The demand for higher benefits and more effective cost, in the development of R+D+i in health sciences requires:

infrastructures that guarantee adequate services to the research community that carries out its activity in the SNS while facilitating the rapid transfer of the knowledge generated for the benefit of patients and citizens

Platform ITEMAS - ISCIII for Dynamization and Innovation of the industrial capacities of the SNS and their effective transfer to the productive sector

Plataforma ISCIII de Dinamización e innovación de las capacidades industriales del SNS y su transferencia efectiva al sector productivo (ITEMAS) (PT20/00081) financiada por el Instituto de Salud Carlos III. Proyecto cofinanciado con el Fondo Europeo de Desarrollo Regional (FEDER).

About us

ITEMAS is the Platform for Dynamization and Innovation of the industrial capacities of the SNS and its effective transfer to the productive sector, being one of the platforms promoted by the Carlos III Health Institute (ISCIII) as support for R+D+i in Biomedicine and Health Sciences.

ITEMAS is made up of:

- 18 health centers (nodes) financed by the ISCIII
- their respective affiliated centers

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Mission, Vision and Values

Mission

Boost the industrial sector based on the health innovations arising from the centers of the National Health System (SNS) that make up the ITEMAS platform.

Vision

Be the reference platform of the SNS in the transmission and transformation of scientific knowledge, bringing together all the actors of the health ecosystem and promoting the industrial sector of Health Innovation.

Values

- Open, Participative, Creative
- Inclusive
- Disruptive
- Transformative
- Transparent
- Promote Cohesion
- Promotes Commitment to Society
- Support Responsible Innovation
- Boost Industrialization
- Generate Transfer

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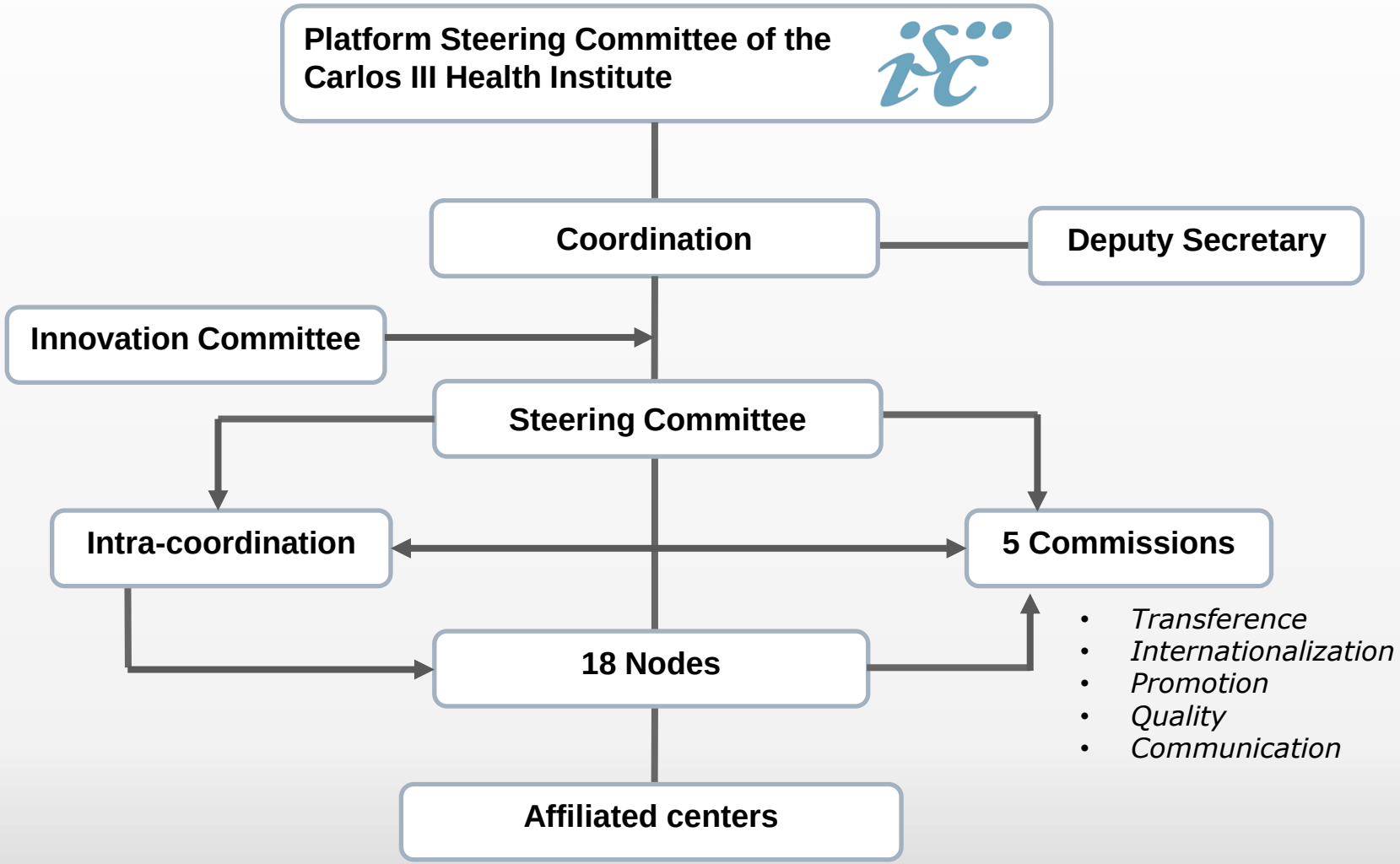
Strategic axes

1. Promote technology transfer
2. Promote the offer of Platform Services
3. Promote the selection of innovative projects attractive to the ecosystem
4. Access public and private funds for projects
5. Develop innovative methods in training
6. Promote the integration and dissemination of the Platform in international networks
7. Increase internal communication and enhance the adherence of centers
8. Generate a feeling of belonging to ITEMAS
9. Improve external communication to all stakeholders
10. Establish a quality management system

Plataforma ISCIII de Dinamización e innovación de las capacidades industriales del SNS y su transferencia efectiva al sector productivo (ITEMAS) (PT20/00081) financiada por el Instituto de Salud Carlos III. Proyecto cofinanciado con el Fondo Europeo de Desarrollo Regional (FEDER).

Organizational structure



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18 Health centers

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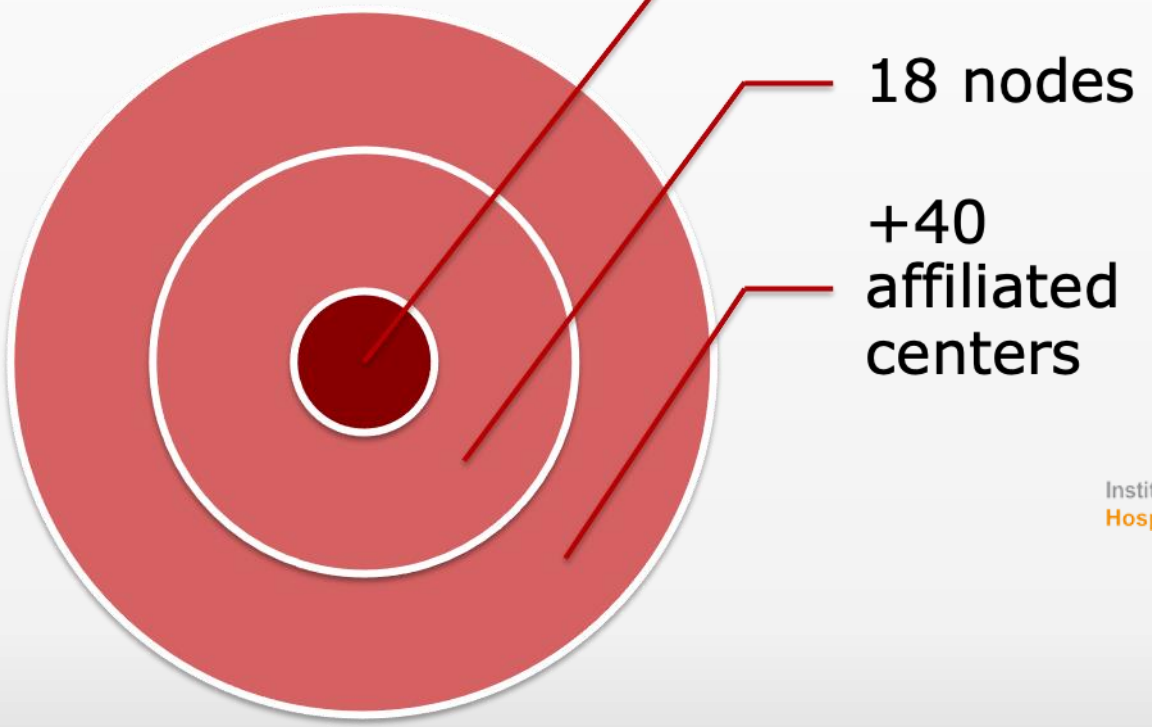
+40 Affiliated centers



INSTITUTO RAMÓN Y CAJAL DE INVESTIGACIÓN SANITARIA IRYCIS
IDIAP Jordi Gol
Vall d'Hebron Institut de Recerca VHIR
IDIBELL
Parc Taulí Institut d'Investigació i Innovació I3PT
Instituto de Investigación Sanitaria La Fe
Institut santpau Investigació Biomèdica | Barcelona
Fundació Fisabio Fundació per al Foment de la Investigació Sanitària i Biomèdica de la Comunitat Valenciana
biodonostia osasun ikerketa institutua instituto de investigación sanitaria
IDIBAPS
IACS Instituto Aragonés de Ciencias de la Salud
i+12 Instituto de Investigación Hospital 12 de Octubre
IIS G-M Instituto de Investigación Sanitaria Gregorio Marañón
idis INSTITUTO DE INVESTIGACIÓN SANITARIA SANTIAGO DE COMPOSTELA
IMIBIC INSTITUTO MAIMÓNIDES DE INVESTIGACIÓN BIOMÉDICA DE CÓRDOBA
Valdecilla Instituto de Investigación Sanitaria IDIVAL
IBiS INSTITUTODEBIOMEDICINADESEVILLA
IdiPAZ Instituto de Investigación Hospital Universitario La Paz

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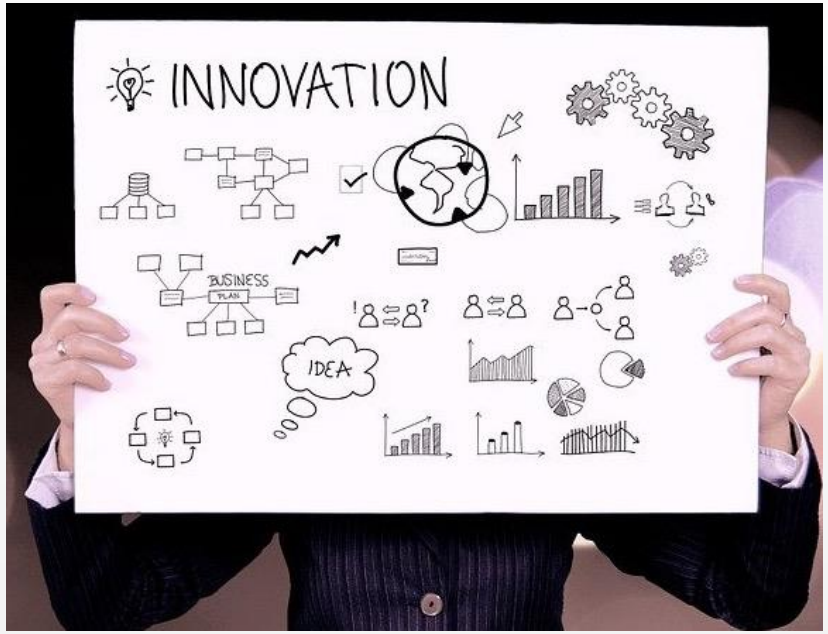
Innovation Committee

- Representatives of the Administration.
- Experts in transfer and intelectual protection.
- Knowledge about the country's industrial strategy and its difficulties.



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Commissions

Transference	**Ensure that the scientific technological advances of the platform are accessible to a greater number of users**
Internacionalization	**Promote the development of valuable activities with foreign partners**
Quality	**Facilitate document management for the proper functioning of the platform**
Communication	**Transmit to citizens and ITEMAS centers all relevant information about the platform**
Promotion	**Facilitate training and space for dialogue on topics of interest to the platform**

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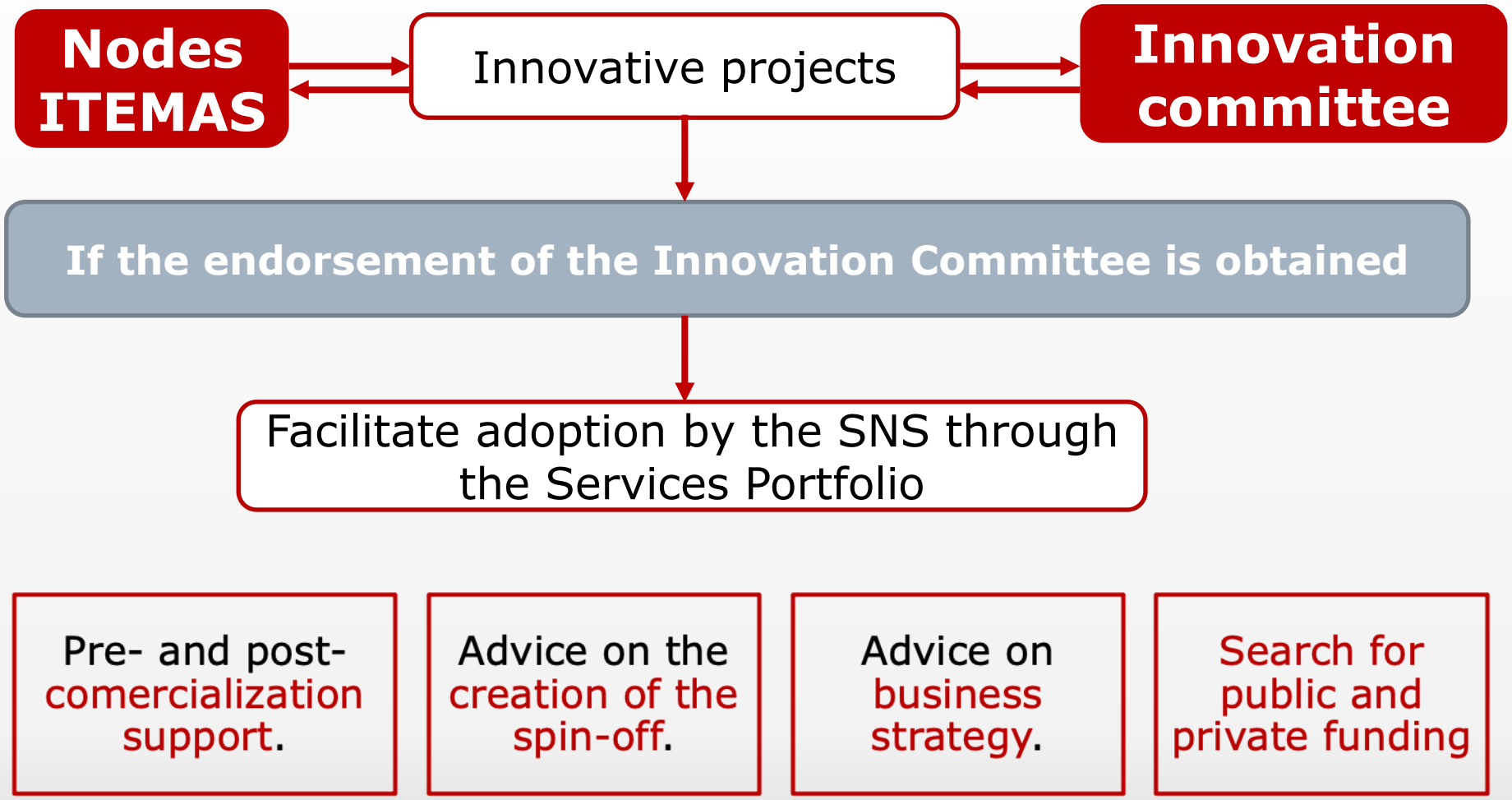
Innovation model



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Portfolio of services

Valorization

Transference

Comercialization

Fundraising

Training

Promotion

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Alliances

federación española de empresas de TECNOLOGÍA SANITARIA

REGIC Red de Entidades Gestoras de Investigación Clínica

MINISTERIO DE INDUSTRIA, COMERCIO Y TURISMO

Oficina Española de Patentes y Marcas

induciencia

PONS ESCUELA DE NEGOCIOS

Raise in for a ride

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Collaborators

Generate a network of entities that accompany us to promote projects that are tractors to the market, through:

- Promotion and training actions.
- Learn about other international models and international positioning.
- Improve market access, business development, transfer and adoption of technologies by the corresponding sector.
- Cover technical deficiencies (both in infrastructures and personnel) in the development of projects.
- ITEMAS participation in forums and strategic organizations in the country as a leading agent in the transfer of healthcare technology.

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Ongoing activities

- iRaise
- Matchmaking *in vitro* diagnostics
- Matchmaking Digital Health
- Annual event ITEMAS 2021

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SEIB R+D Ecosystem

Enrique J. Gómez, President (Spanish Society of Biomedical Engineering)

Spanish Society of Biomedical Engineering

SEIB

Enrique J. Gómez Aguilera
President, SEIB
enriquejavier.gomez@upm.es

Scottish Government Digital Health and Care Event - DigiFest2021

1st of December 2021

SEIB

The **Spanish Society of Biomedical Engineering**
is a non-profit scientific and professional society
to promote **Biomedical Engineering in Spain**

Biomedical Engineering
is the application of science and engineering principles to medicine and biology

SEIB

- Founded in 1981
- **Mission:** to improve the health, wealth, and wellbeing of the Spanish citizens by the application of Biomedical Engineering
- It belongs to **IFMBE** and **EAMBES**

Goals

- Foster **BME education** (bachelor, master, doctorate programs) and training programs for health professionals
- Promote **BME research** and public and private funding
- Enhance **research-industry collaboration** (medical and digital health technology) and institutions (FENIN)
  - Improve the **transfer of BME knowledge and technologies** to business sectors
- Promote **innovation and entrepreneurship in health technologies**
- Support the **new generations of biomedical engineers**
  - Facilitate BME graduates their job placement in hospitals, companies, research centers and administration
- Collaborate with **international/national societies** (BME, medical, etc.)

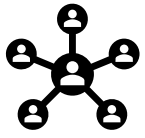
BME Education and Research

- **Education** (official degree programmes):
  - 21BME bachelor
  - 13 MSc
  - 2 PhD
- **Research**
  - 31 research centres
  - CIBER-BBN

- 12 collaboration **agreements** with medical societies and institutions

Strategic Action lines

- Become a **strong voice** for BME academic/ research/innovation technologies in Spain
- Position BME on the **Spanish research and policy agenda**



- Develop a **dialogue between SEIB & key policy makers** in BME and related fields
- Promote **interdisciplinary collaboration** of BME engineers with health care professionals, patients and citizens

- **Disseminate to society the relevance of BME** for improving the quality of life of citizens, and even more so in the current pandemic

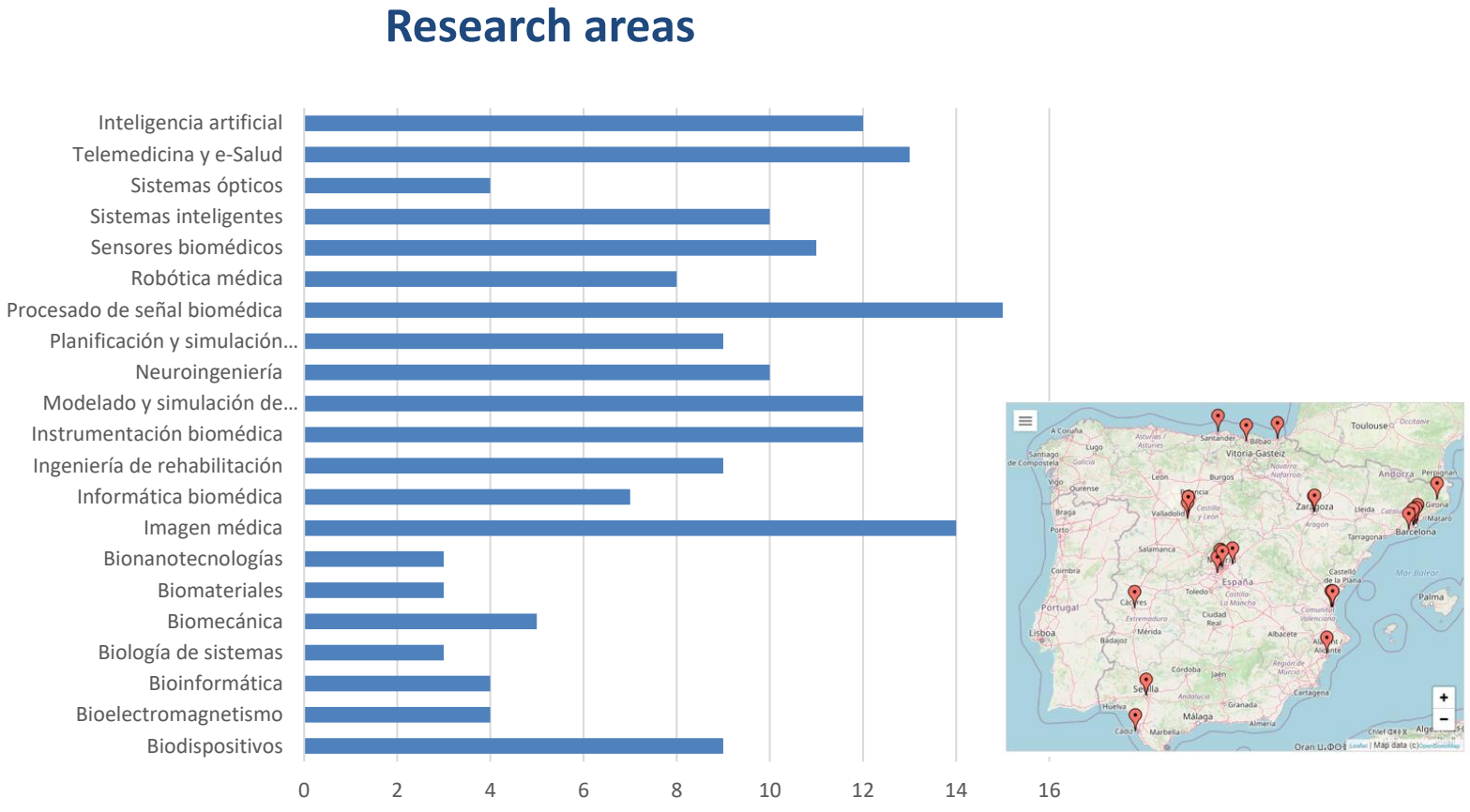
CASEIB 2021 XXXIX Congreso Anual de la Sociedad Española de Ingeniería Biomédica

- **Annual Congress of SEIB (CASEIB)**

SEIB-Research centres

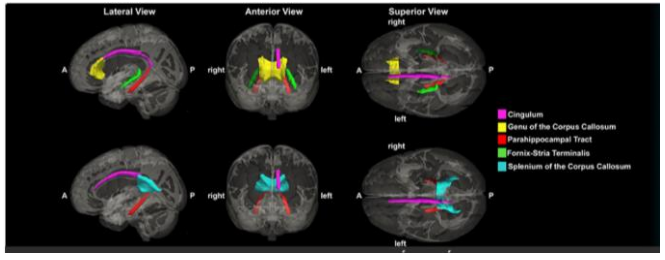
- 32 research centres

Research thematic areas



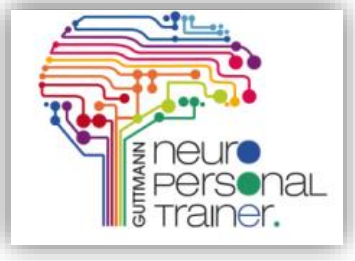
Digital Health research in Active and Healthy Ageing

- Medical imaging



- Biomedical signals

- mHealth and digital health



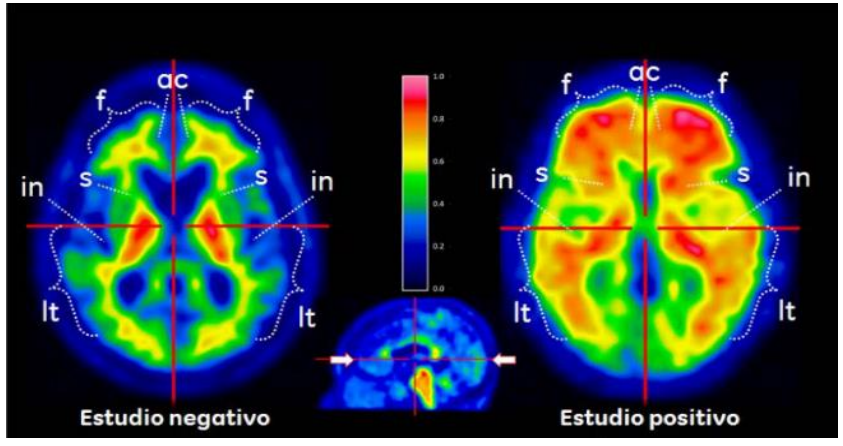
GBT- PET Neuroimaging

- **PET-FDG images as an essential tool in the differential diagnosis of neurodegenerative diseases.**
  - Specific patterns of both cortical and subcortical metabolic alterations.
  - Quantitative analysis for the detection of these patterns
  - Algorithms and classification and prediction systems to aid clinical decision based on machine learning algorithms

- **Examples:** Alzheimer's disease, differentiation of Parkinson's disease, MCI, primary progressive aphasia

Alzheimer and Parkinson Disease

^{18}F-flutemetamol



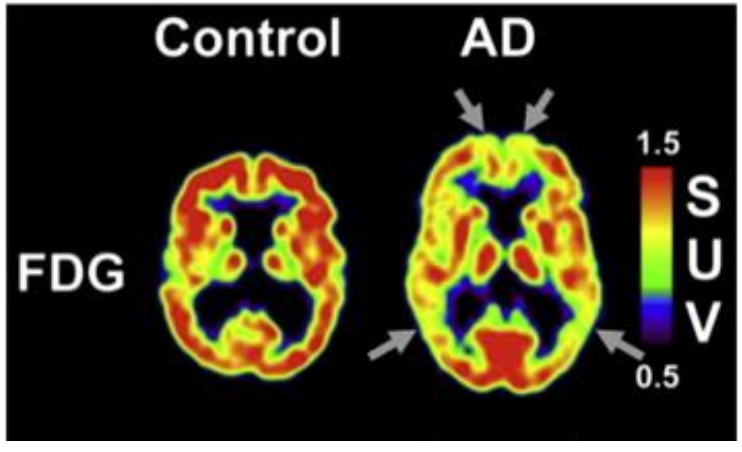
Novel quantitative image parameters (e.g. radiomics*)

⇓

Clinical decision support systems

* A. P. Seiffert *et al.*, "Texture-Based Analysis of ^{18}F-Labeled Amyloid PET Brain Images," *Appl. Sci.*, vol. 11, no. 5, p. 1991, Feb. 2021, doi: 10.3390/app11051991.

^{18}F-FDG PET



Alzheimer's patient. Arrows indicate regions of hypometabolism.

Parkinson's disease and parkinsonisms

Primary progressive aphasia

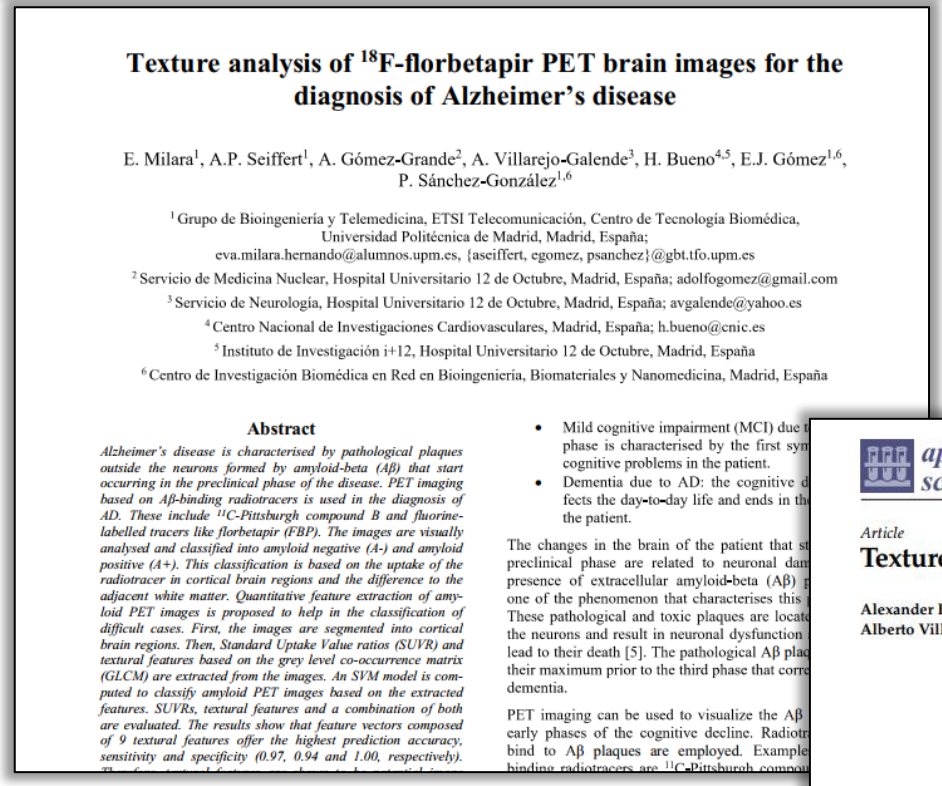
Quantification of cortical and subcortical metabolism

⇓

Machine learning algorithms for classifcation models

GBT- PET Neuroimaging

Spanish Society of Biomedical Engineering



Texture analysis of ^{18}F-florbetapir PET brain images for the diagnosis of Alzheimer's disease

E. Milara[1], A.P. Seiffert[1], A. Gómez-Grande[2], A. Villarejo-Galende[3], H. Bueno[4,5], E.J. Gómez[1,6], P. Sánchez-González[1,6]

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[4] Centro Nacional de Investigaciones Cardiovasculares, Madrid, España; h.bueno@cnic.es

[5] Instituto de Investigación i+12, Hospital Universitario 12 de Octubre, Madrid, España

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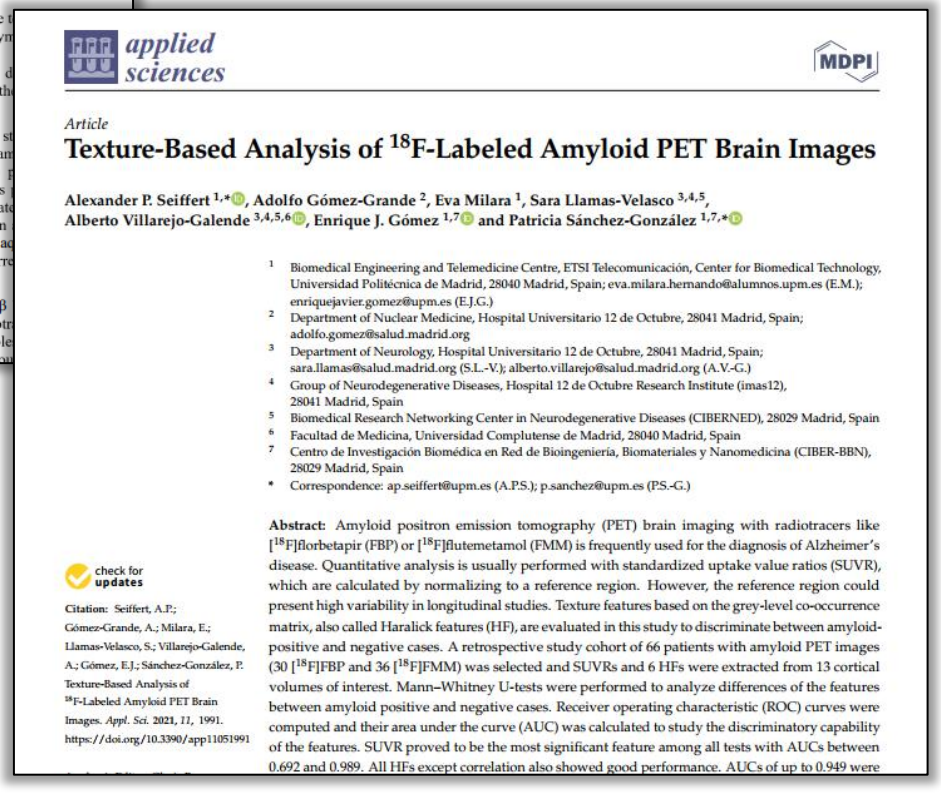
Abstract

Alzheimer's disease is characterised by pathological plaques outside the neurons formed by amyloid-beta (Aβ) that start occurring in the preclinical phase of the disease. PET imaging based on Aβ-binding radiotracers is used in the diagnosis of AD. These include ^{11}C-Pittsburgh compound B and fluorine-labelled tracers like florbetapir (FBP). The images are visually analysed and classified into amyloid negative (A-) and amyloid positive (A+). This classification is based on the uptake of the radiotracer in cortical brain regions and the difference to the adjacent white matter. Quantitative feature extraction of amyloid PET images is proposed to help in the classification of difficult cases. First, the images are segmented into cortical brain regions. Then, Standard Uptake Value ratios (SUVR) and textural features based on the grey level co-occurrence matrix (GLCM) are extracted from the images. An SVM model is computed to classify amyloid PET images based on the extracted features. SUVRs, textural features and a combination of both are evaluated. The results show that feature vectors composed of 9 textural features offer the highest prediction accuracy, sensitivity and specificity (0.97, 0.94 and 1.00, respectively).

- Mild cognitive impairment (MCI) due t
  phase is characterised by the first sy
  cognitive problems in the patient.
- Dementia due to AD: the cognitive d
  fects the day-to-day life and ends in th
  the patient.

The changes in the brain of the patient that st
preclinical phase are related to neuronal dan
presence of extracellular amyloid-beta (Aβ) p
one of the phenomenon that characterises this
These pathological and toxic plaques are locat
the neurons and result in neuronal dysfunction
lead to their death [5]. The pathological Aβ plaq
their maximum prior to the third phase that corre
dementia.

PET imaging can be used to visualize the Aβ
early phases of the cognitive decline. Radiotr
bind to Aβ plaques are employed. Example
binding radiotracers are ^{11}C-Pittsburgh compou



applied sciences

MDPI

Article

Texture-Based Analysis of ^{18}F-Labeled Amyloid PET Brain Images

Alexander P. Seiffert [1,*], Adolfo Gómez-Grande [2], Eva Milara [1], Sara Llamas-Velasco [3,4,5], Alberto Villarejo-Galende [3,4,5,6], Enrique J. Gómez [1,7] and Patricia Sánchez-González [1,7,*]

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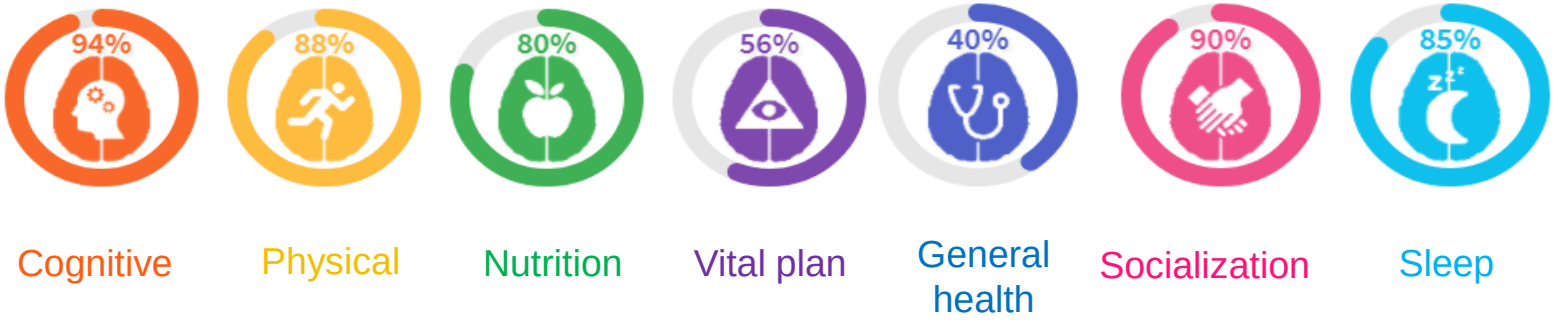
Citation: Seiffert, A.P.; Gómez-Grande, A.; Milara, E.; Llamas-Velasco, S.; Villarejo-Galende, A.; Gómez, E.J.; Sánchez-González, P. Texture-Based Analysis of ^{18}F-Labeled Amyloid PET Brain Images. *Appl. Sci.* **2021**, *11*, 1991. https://doi.org/10.3390/app11051991

Abstract: Amyloid positron emission tomography (PET) brain imaging with radiotracers like [^{18}F]florbetapir (FBP) or [^{18}F]flutemetamol (FMM) is frequently used for the diagnosis of Alzheimer's disease. Quantitative analysis is usually performed with standardized uptake value ratios (SUVR), which are calculated by normalizing to a reference region. However, the reference region could present high variability in longitudinal studies. Texture features based on the grey-level co-occurrence matrix, also called Haralick features (HF), are evaluated in this study to discriminate between amyloid-positive and negative cases. A retrospective study cohort of 66 patients with amyloid PET images (30 [^{18}F]FBP and 36 [^{18}F]FMM) was selected and SUVRs and 6 HFs were extracted from 13 cortical volumes of interest. Mann–Whitney U-tests were performed to analyze differences of the features between amyloid positive and negative cases. Receiver operating characteristic (ROC) curves were computed and their area under the curve (AUC) was calculated to study the discriminatory capability of the features. SUVR proved to be the most significant feature among all tests with AUCs between 0.692 and 0.989. All HFs except correlation also showed good performance. AUCs of up to 0.949 were

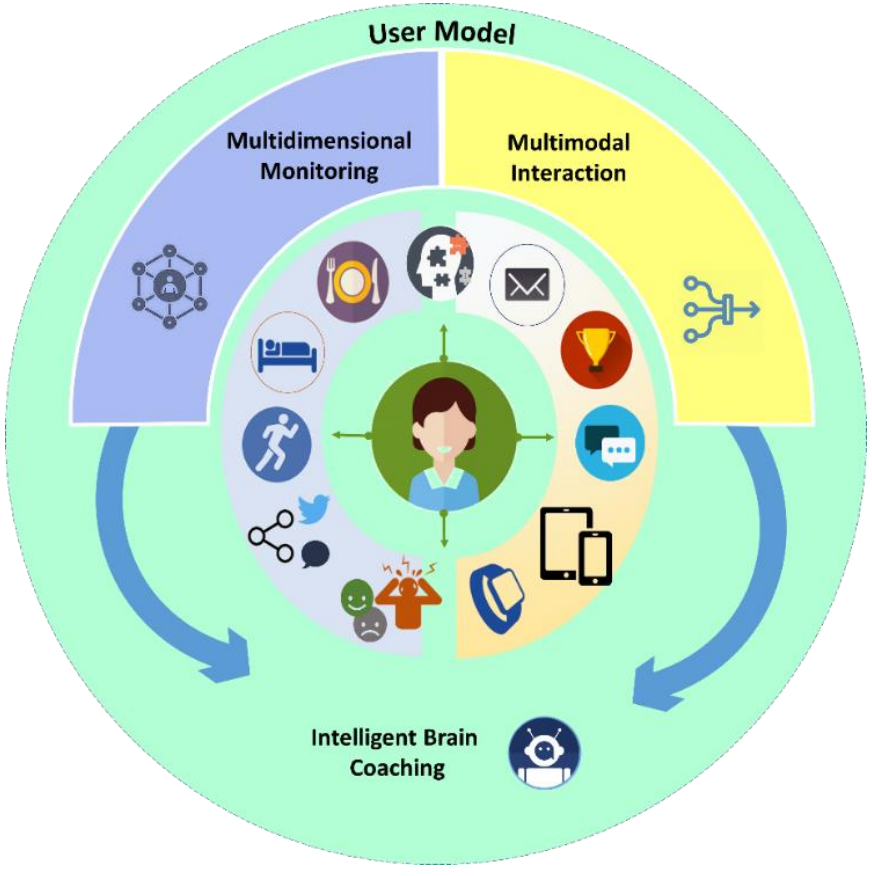
GBT-UPM: *Brain Health in an ageing society*

- **Keep** Brain Health at any age
- **Early detection** on risk indicators from a brain health to illness
- **Early intervention**
- **Prospective longitudinal study**: >5700 volunteers, aged 40–65 y
- Improvement of lifestyle behaviour on **7 domains:**

D. Bartrés (UB), JM Tormos (Guttmann), A. Pascual-Leone (Harvard)



GBT- UPM: *Intelligent Brain Coaching*



- mHealth solution integrating innovative **multidimension monitoring**
- **interaction technologies**, multi-domain activity and brain health analysis, gamification,
- recommendation systems for **coaching** and **multimodal interventions**
- IA data analysis methods of **extracting evidence** from the BBHI database

GBT- UPM: *Intelligent Brain Coaching*

sensors

MDPI

Review

Technologies for Monitoring Lifestyle Habits Related to Brain Health: A Systematic Review

Diego Moreno-Blanco [1,*], Javier Solana-Sánchez [2,3], Patricia Sánchez-González [1,4], Ignacio Oropesa [1], César Cáceres [1,5], Gabriele Cattaneo [2,6], Josep M. Tormos-Muñoz [2,3], David Bartrés-Faz [2,6,7], Álvaro Pascual-Leone [2,8] and Enrique J. Gómez [1,4]

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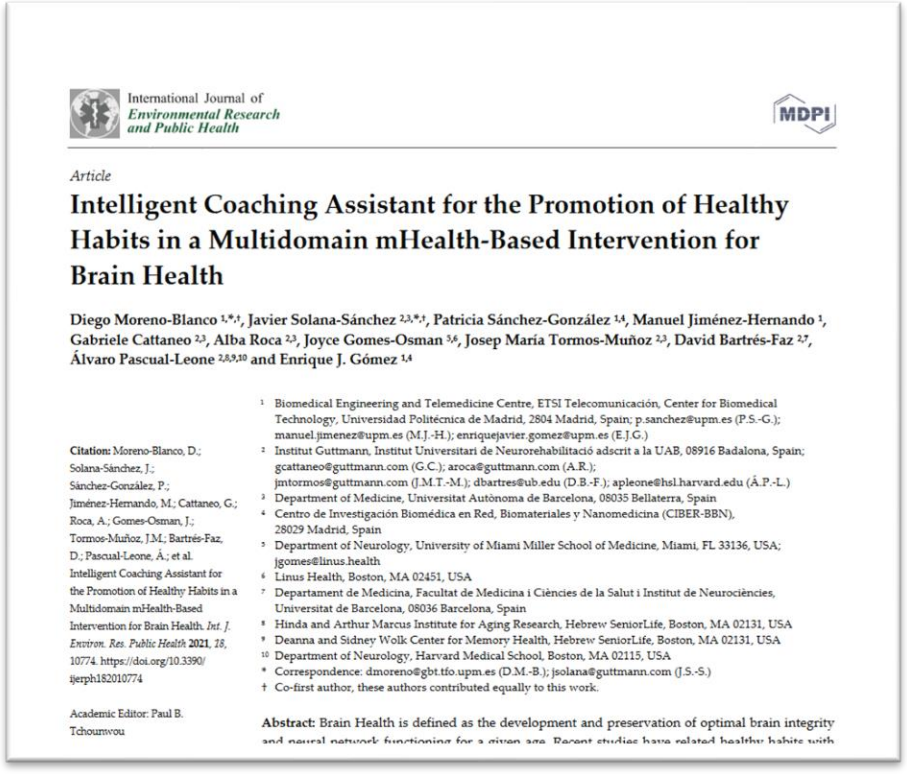
Abstract: Brain health refers to the preservation of brain integrity and function optimized for an individual's biological age. Several studies have demonstrated that our lifestyles habits impact our



International Journal of *Environmental Research and Public Health*

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Article

Intelligent Coaching Assistant for the Promotion of Healthy Habits in a Multidomain mHealth-Based Intervention for Brain Health

Diego Moreno-Blanco [1,*,†], Javier Solana-Sánchez [2,3,*,†], Patricia Sánchez-González [1,4], Manuel Jiménez-Hernando [1], Gabriele Cattaneo [2,3], Alba Roca [2,3], Joyce Gomes-Osman [5,6], Josep María Tormos-Muñoz [2,3], David Bartrés-Faz [2,7], Álvaro Pascual-Leone [2,8,9,10] and Enrique J. Gómez [1,4]

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† Co-first author, these authors contributed equally to this work.

Citation: Moreno-Blanco, D.; Solana-Sánchez, J.; Sánchez-González, P.; Jiménez-Hernando, M.; Cattaneo, G.; Roca, A.; Gomes-Osman, J.; Tormos-Muñoz, J.M.; Bartrés-Faz, D.; Pascual-Leone, Á.; et al. Intelligent Coaching Assistant for the Promotion of Healthy Habits in a Multidomain mHealth-Based Intervention for Brain Health. *Int. J. Environ. Res. Public Health* **2021**, *18*, 10774. https://doi.org/10.3390/ijerph182010774

Academic Editor: Paul B. Tchounwou

Abstract: Brain Health is defined as the development and preservation of optimal brain integrity and neural network functioning for a given age. Recent studies have related healthy habits with

Spanish Society of Biomedical Engineering

SEIB

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Scottish Government Digital Health and Care Event - DigiFest2021

1st of December 2021

Gipuzkoa Ecosystem for Digital Health entrepreneurs

Esther Paguey and **Eduardo Jauregui** (Gipuzkoa Entrepreneurs Association)

Gipuzkoako Foru Aldundia
Ekonomia Sustapeneko, Landa Inguruneko eta Lurralde Orekako Departamentua

Diputación Foral de Gipuzkoa
Departamento de Promoción Económica, Medio Rural y Equilibrio Territorial

EUSKO JAURLARITZA GOBIERNO VASCO

EKONOMIAREN GARAPEN ETA LEHIAKORTASUN SAILA

DEPARTAMENTO DE DESARROLLO ECONÓMICO Y COMPETITIVIDAD

GRUPO spri TALDEA

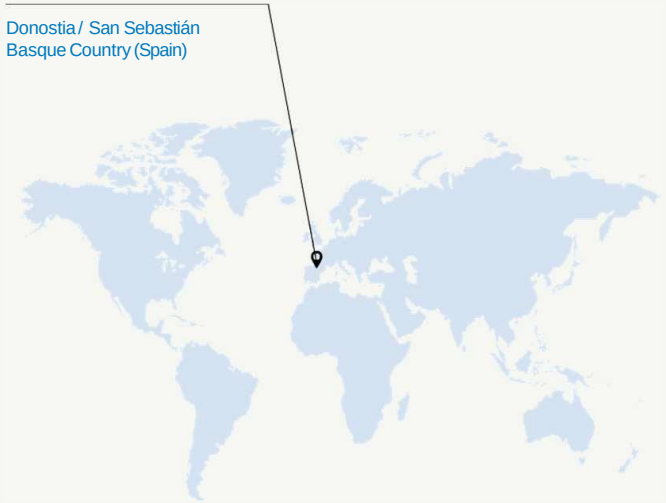
BIC GIPUZKOA

Euskadi, a singular space

The Basque Country has a strategic location in Europe and a long entrepreneurial tradition. Industrial and entrepreneurial activity have always driven one of the regions with the highest level of economic growth and well-being in Europe.

Today constant commitment to innovation and competitiveness are causing the profound transformation of industry, looking for new ideas, new activities...The biosciences/health binomium is one of the region's strategic priorities. And in this field numerous successful business initiatives with a strong capacity for expansion are already underway.

BIC Gipuzkoa plays a decisive role in the backing of new projects.

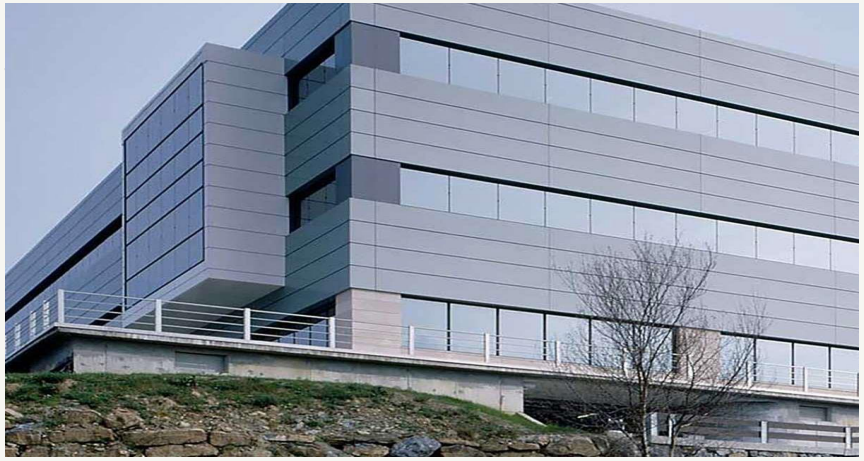


Operational Body of FBGF

Bic Gipuzkoa is the Operational Body of the Biosciences Gipuzkoa Foundation, created by Diputación Foral de Gipuzkoa and Kutxa Fundazioa, whose mission is to favor the development of the biosanitary field in Gipuzkoa by supporting the financing of business projects.

BIC Gipuzkoa Bioincubator

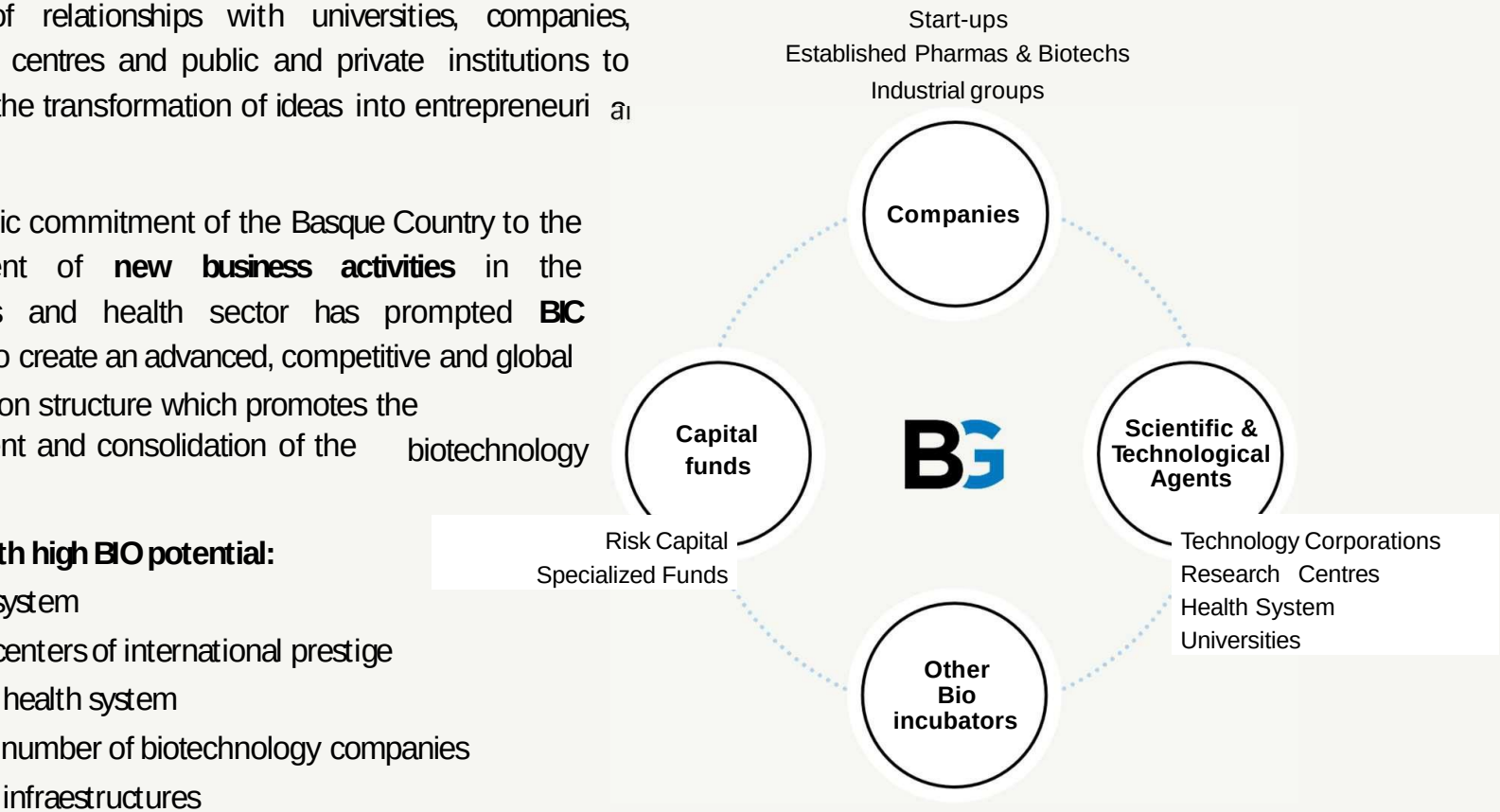
Supports the development of new entrepreneurial projects in the fields of Biotechnology, Bioengineering and Health, offering specialised support and services



BIC GIPUZKOA

BIC Gipuzkoa Business Innovation Centre, has more than 25 years of experience as a facilitator in the process of creating new innovative companies. It is an important engine in the region's **entrepreneurial ecosystem** and has generated a network of relationships with universities, companies, technology centres and public and private institutions to accelerate the transformation of ideas into entrepreneuri al projects.

The strategic commitment of the Basque Country to the development of **new business activities** in the biosciences and health sector has prompted **BIC Gipuzkoa** to create an advanced, competitive and global bioincubation structure which promotes the development and consolidation of the biotechnology sector.

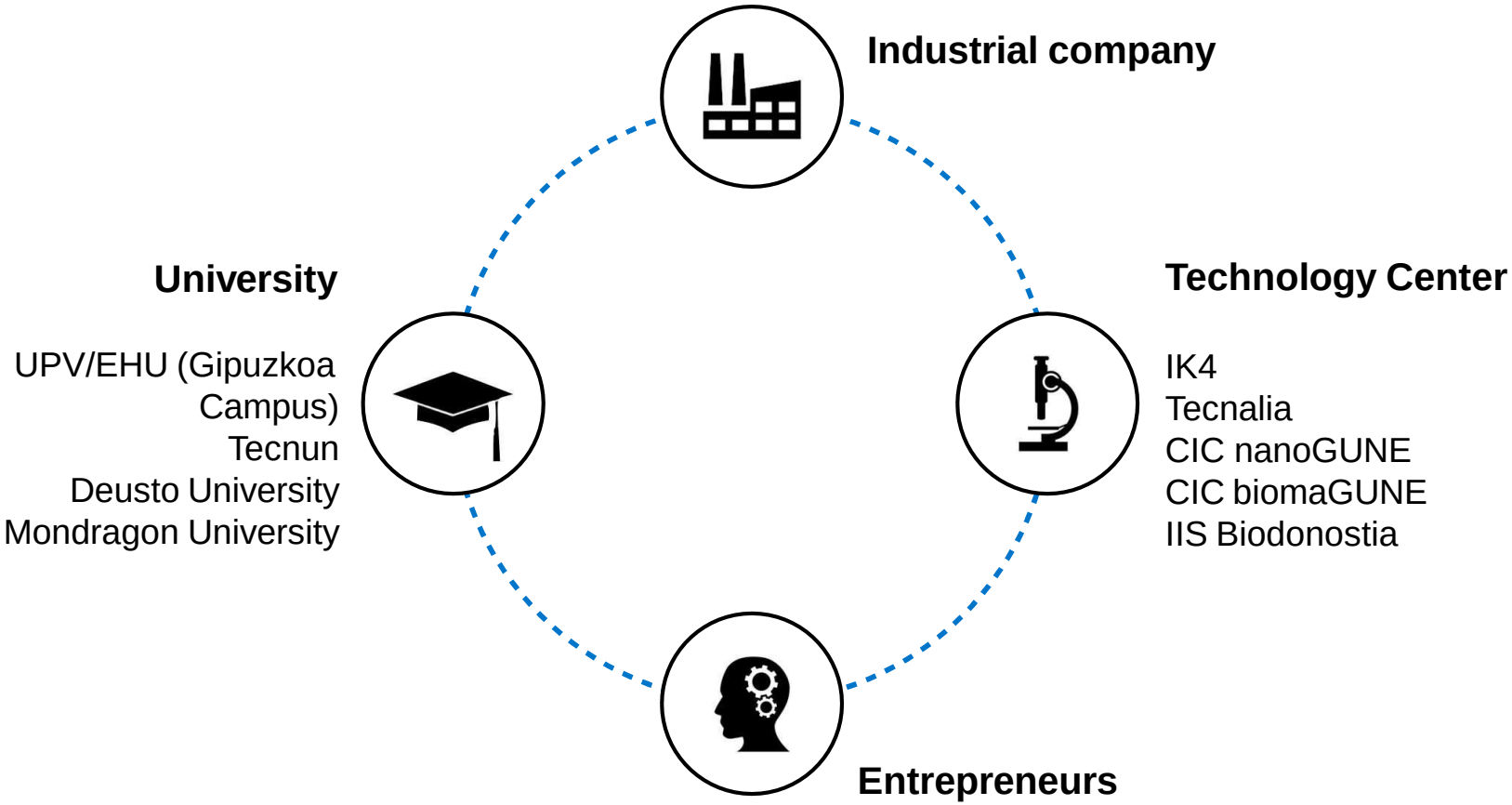


A region with high BIO potential:

- R+D+i ecosystem
- Research centers of international prestige
- Advanced health system
- Increasing number of biotechnology companies
- Advanced infraestructures
- Commitment of the public administrations
- Presence of industrial groups which are potential users of biotechnology.

BIC GIPUZKOA
UP! EUSKADI

Origin of projects



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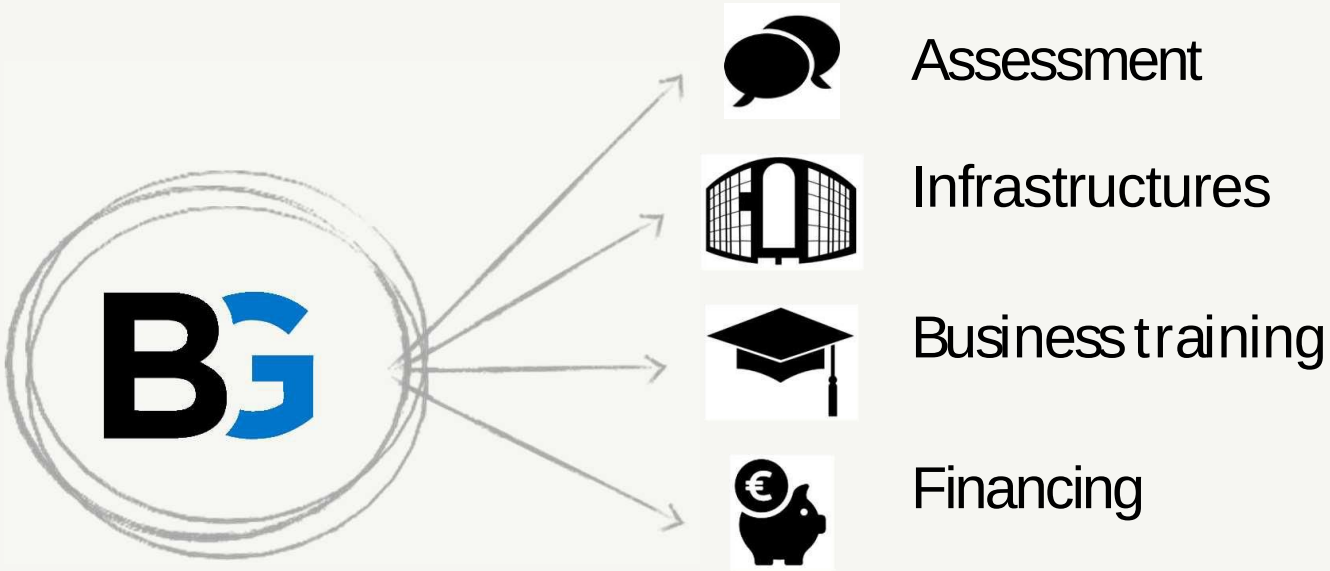
We facilitate

entrepreneurial initiatives



BIC GIPUZKOA

Supported projects

893
Supported **Projects**

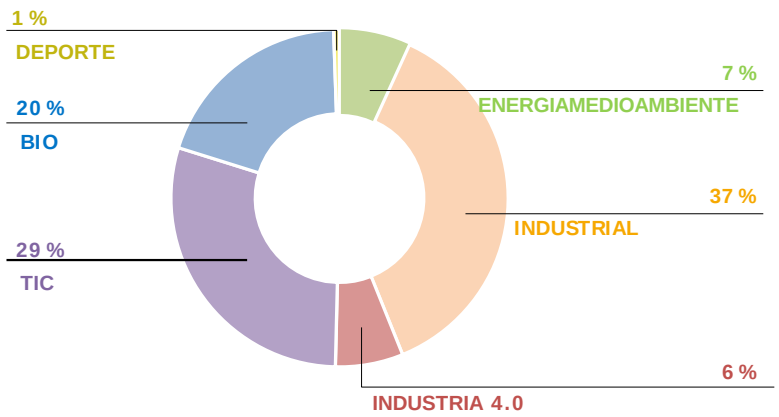
2003
2021

497 (56 %)
Ekintzaile
Txekintek

333 (37 %)
Barnetekin
Ekintzaile

Suppported projects per sector

20 % Health Sciences



BIC GIPUZKOA
UP! EUSKADI

Our numbers speak

2021

300 Analized **initiatives**

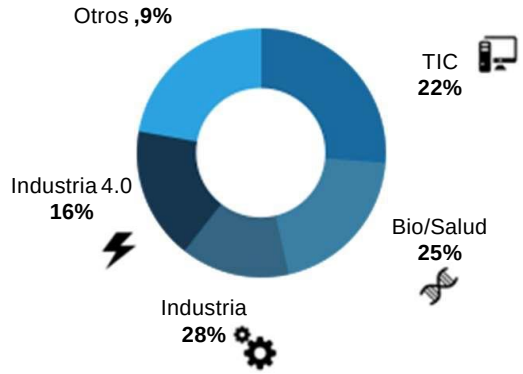
49 **Ekintzaile** Txekintek

32 **Barnetekin** Ekintzaile

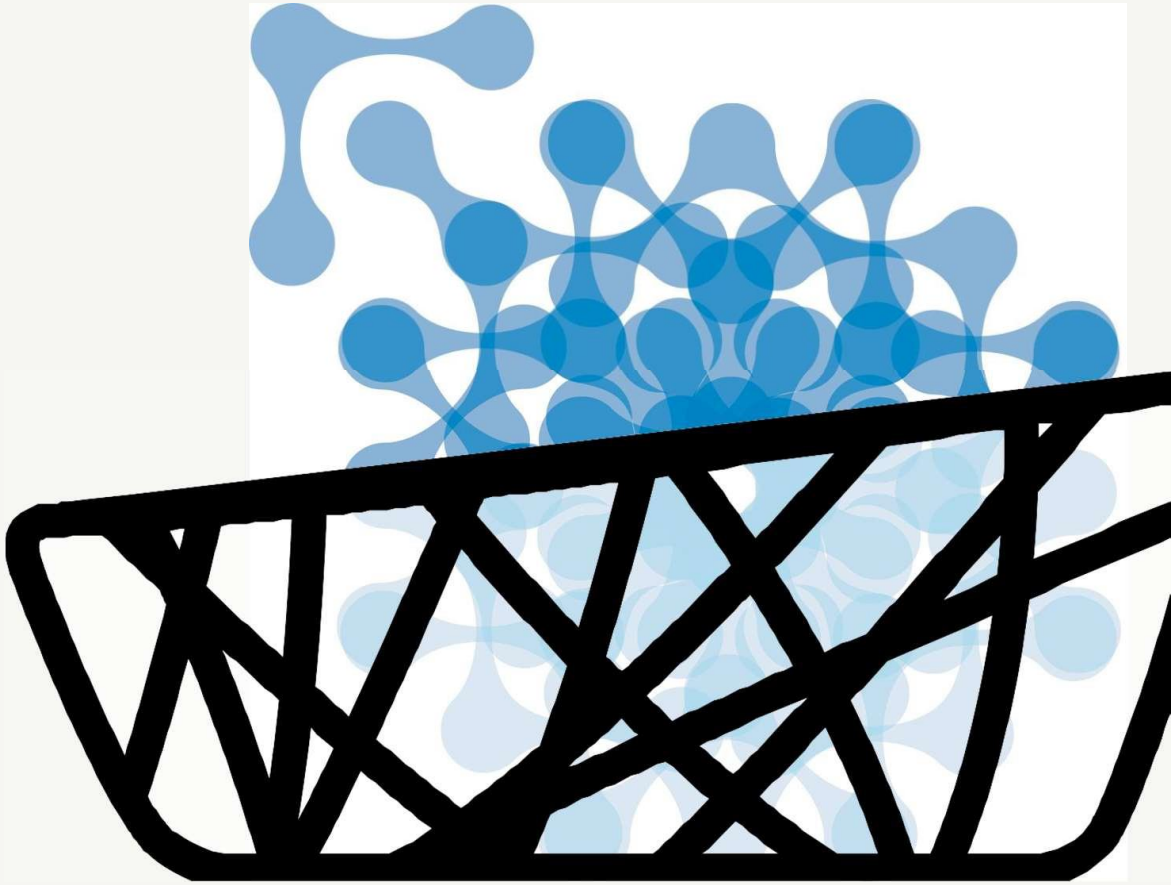
37 **Business** created

416 **Employment** (3-5 years forecast)

28 Mill. € **Investment** (3-5 years forecast)



The Bio **Experience**



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UP! EUSKADI

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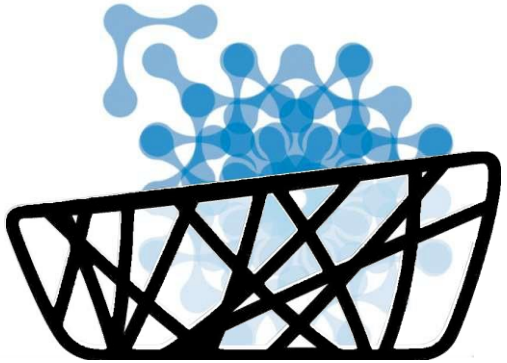
UP! EUSKADI

The **Bio** Experience



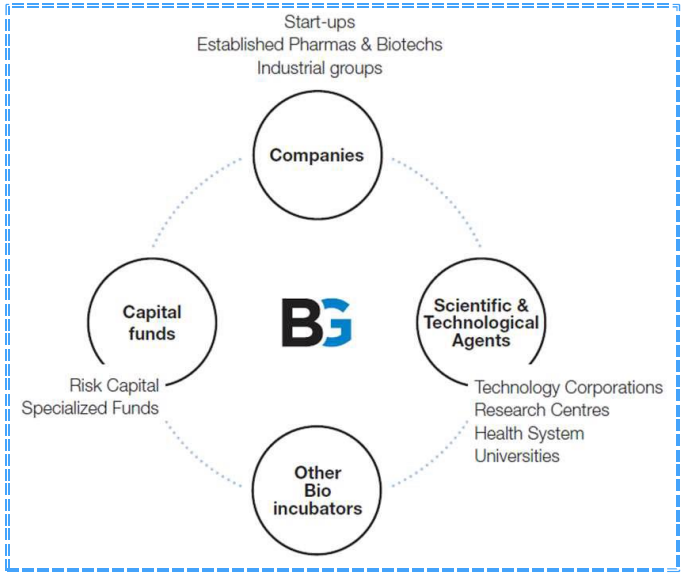
Advanced bio-incubation infrastructure

- Promote new business projects in the field of Biotechnology, Bioengineering and Health
- Support and specialized services throughout the entire process, accelerating the transformation of ideas into entrepreneurial projects
- Valorization of projects in the field of biosciences / health
- Specialized training

Bio Experience

BIC GIPUZKOA
UP! EUSKADI

The **Bio** Experience



Bioincubation process: The value chain approach

"Successful Start-Up Management"

Research & Development ⇒ Knowledge & Technology Transfer

Technical & Organizational Services

Technical and expert services for validation & commercialization of advanced technologies

Pre-incubation Seed start-up

- Valorization
- IP Strategy
- Corporate Strategy
- Finance Strategy
- Business Model
- Business Plan
- Lab Space

Incubation Start-up

- Technical and Scientific Services
- Technical Advisory
- Business Advisory
- Financial Advisory
- Lab Space

High Advanced Services

Mentoring, business and technical services

Biomedical entrepreneurship training programme. Business training. Technical training

Well-equipped lab space with advanced instrumentation

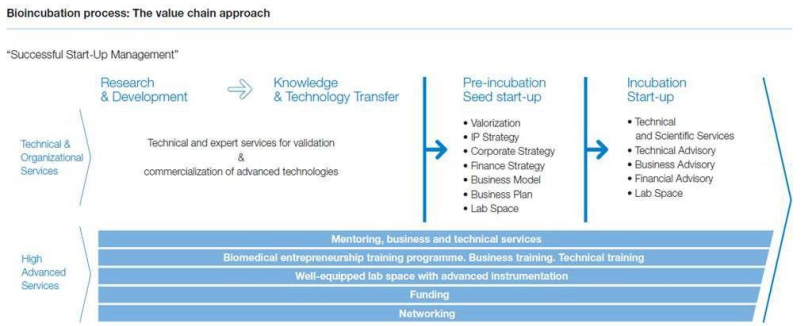
Funding

Networking

How do we do it

BIC GIPUZKOA
UP! EUSKADI

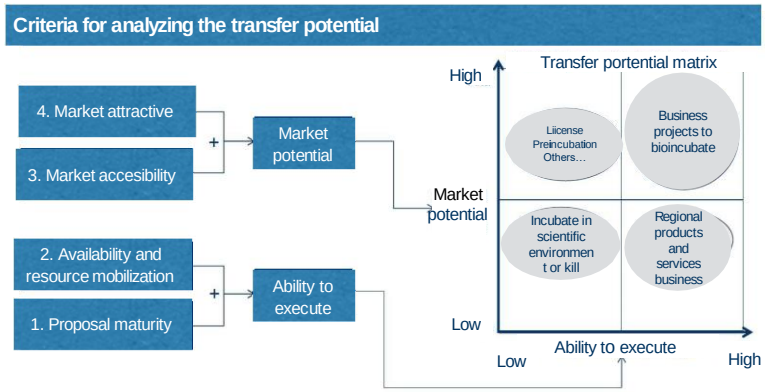
The **Bio** Experience

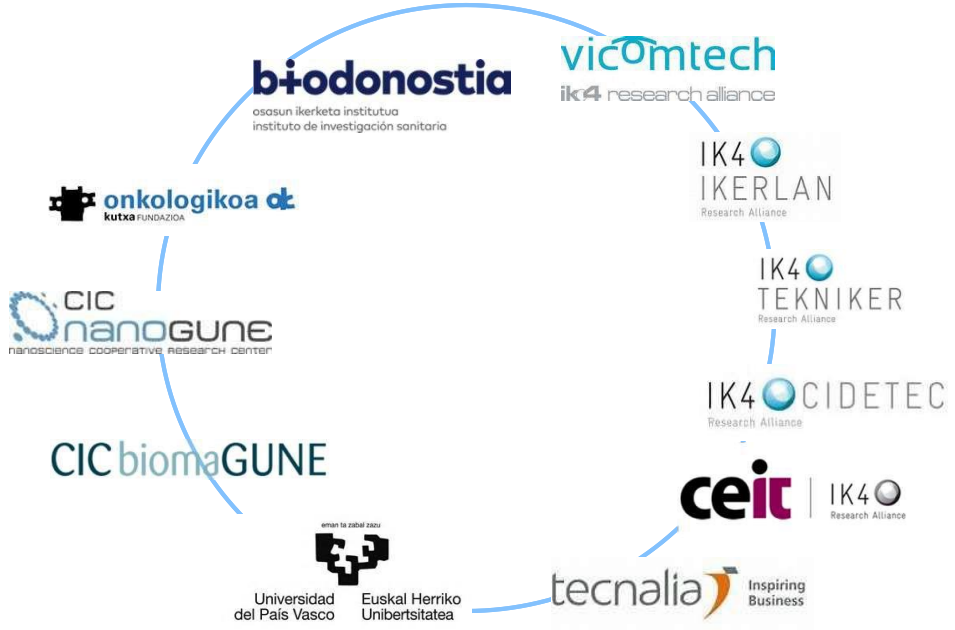


VALUATION OF BIOTECH PORTFOLIOS

The valorization allows an expert analysis of the projects, resulting in recommendations for their development:

- projects to be incubated,
- projects that require a greater R & D effort
- projects to stop





Cómo lo hacemos

BIC GIPUZKOA
UP! EUSKADI

The **Bio** Experience

TRAINING PROGRAMME FOR ENTREPRENURSHIP IN THE HEALTH SECTOR

Training with first level experts for bioentrepreneurs: Market and commercialisation, regulatory, development, IP, financing

Bio Experience

Infrastructure:
The Bioincubator has a total of more than 700 m^2, which are divided into the following areas:

9 modules/ independent laboratories

1 Shared laboratory
1 Cellular cultivation room 1 Bacteria cultivation room 1 PCR room
1 Microscopy room
1 Refrigeration room
1 Wash room
1 "soft" area
2 Meeting rooms

BIC GIPUZKOA
UP! EUSKADI

Our numbers speak

03-
21

893
Supported Projects

175
LIFE SCIENCES

67
START-UPS

67
Start ups created

30 **MEDICAL DEVICE**

16 **EHEALTH**

21 **BIOTECH**

How do we do it

BIC GIPUZKOA UP! EUSKADI

FUNDACIÓN BIOZIENTZIAK GIPUZKOA FUNDAZIOA

The **Bio** Experience

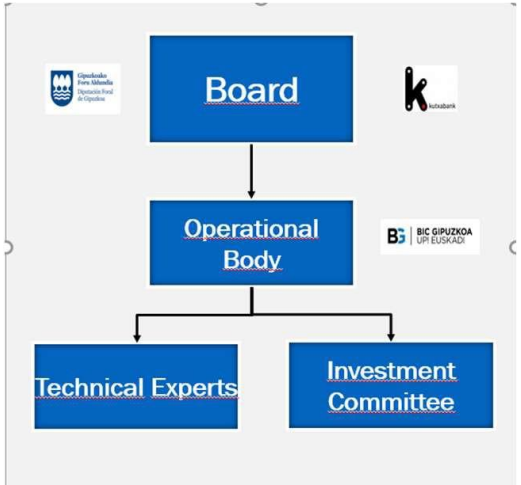
Contribute to the **development of the biosciences/ health field** in Gipuzkoa

Promote a **culture that promotes excellence** in business development

Carry **out awareness activities** for society and business

Support **companies in the bio-sanitary sector** for the development of business projects

Encourage financial support for entrepreneurship in the field of biosciences



Bio Experience

BIC GIPUZKOA UP! EUSKADI

Businesses created:

BIC Gipuzkoa members:

Gipuzkoako Foru Aldundia
Ekonomia Sustapeneko, Landa Inguruneko eta Lurralde Orekako Departamentua
Ekonomia Sustapeneko Zuzendaritza Nagusia

Diputación Foral de Gipuzkoa
Departamento de Promoción Económica, Medio Rural y Equilibrio Territorial
Dirección General de Promoción Económica

EUSKO JAURLARITZA
GOBIERNO VASCO
EKONOMIAREN GARAPEN ETA AZPIEGITURA SAILA
DEPARTAMENTO DE DESARROLLO ECONÓMICO E INFRAESTRUCTURAS

GRUPO spri TALDEA

Contact:

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20009 Donostia / San Sebastián
SPAIN

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Iñaki Goenaga, 5
20600 Eibar
SPAIN

T. (+34) 943 000 999
bic@bicgipuzkoa.eus
www.bicgipuzkoa.eus

Estrategias

Diputación Foral Gipuzkoa

Bic Gipukoa with the **Foundations** collaborate in entrepreneruship

- **Valorisation** of new projects
- **Project management**
- **Awards, Open Innovation**

MUBIL
GIPUZKOAKO ELEKTROMUGIKORTASUN ZENTROA

ZIUR
INDUSTRIAL CYBER SECURITY CENTER-GIPUZKOA

ADINBERRI
OSASUNTSU ZAHARTZEKO ESTRATEGIA

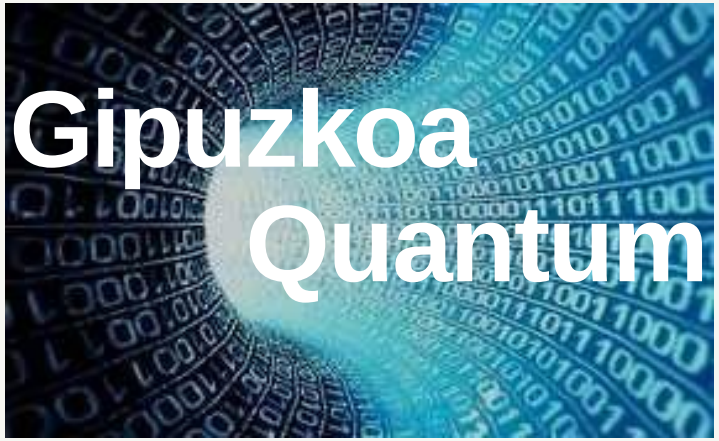
Lab
DIGITAL GASTRONOMY LAB

PERTE

Proyectos Estratégicos para la Recuperación y Transformación Económica

Bic Gipukoa is the Operative **Operating Body** in quantic and gene therapies Projects.

GIPUZKOA
ETORKIZUNA ORAIN



BIC GIPUZKOA
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www.bicgipuzkoa.eus

Gipuzkoako Foru Aldundia
Ekonomia Sustapeneko, Landa Inguruneko eta Lurralde Orekako Departamentua

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DEPARTAMENTO DE DESARROLLO ECONÓMICO Y COMPETITIVIDAD

GRUPO spri TALDEA

IRISBOND

December 2021

Eye-tracking technology in the Health Sector

See it Possible

About IRISBOND

We are developers and experts in assistive technology

Technological company based in the Basque Country founded in 2013. Pioneer in eye-tracking and facial recognition technologies and their use for different areas.

In its more than seven years of life, Irisbond has developed its own devices, SDKs for developers, and collaborates with companies such as Samsung, Microsoft, Apple, or institutions such as MIT, among others.

We apply our technology mainly in AAC and health. We can also develop ad-hoc integration projects.

IRISBOND, Limitless eye-tracking technology for AAC

Hiru: first multiplatform eye tracker in the world

Designed to perform in any OS

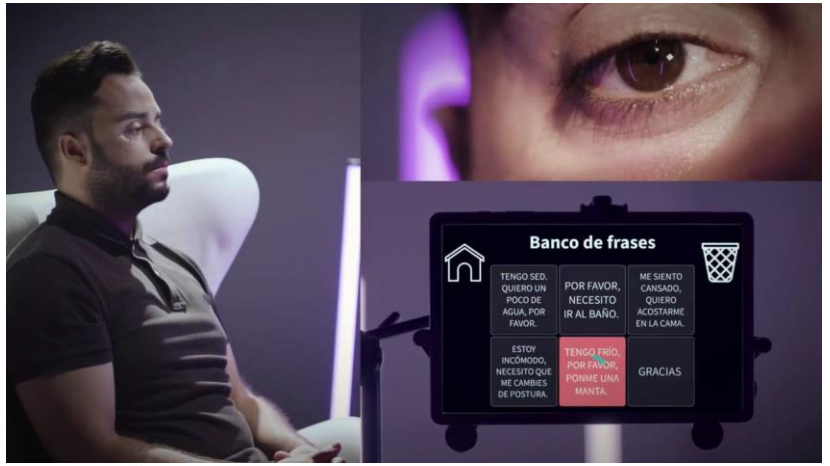
Most advanced eye tracking

Hiru reaches further on the state of the art, higher FPS, with the latest camera and optics for the best accuracy and autonomy. The on-chip technology enables everyone to see everything and everywhere, and in the smartest way.

Best UX

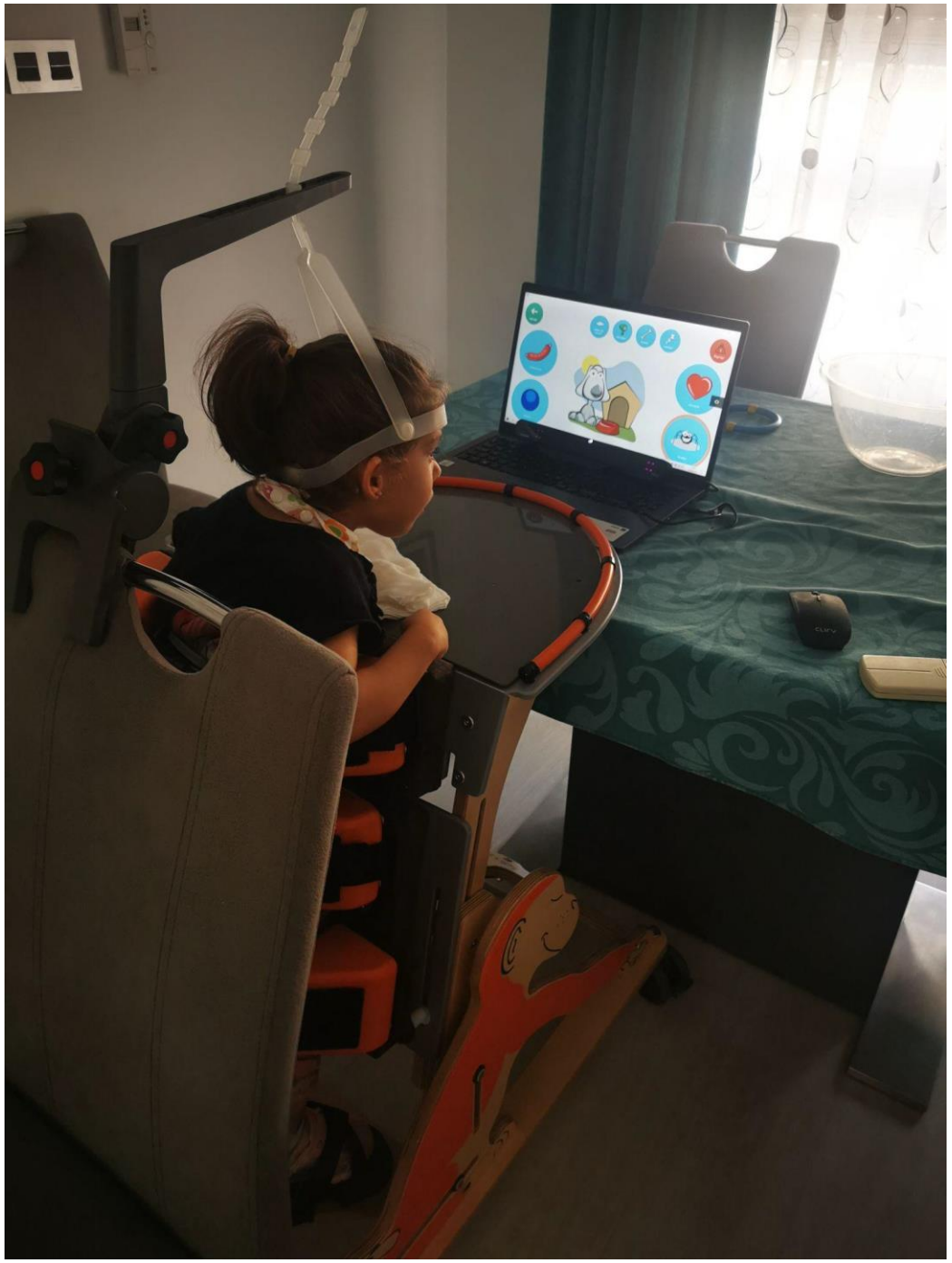
Advanced AI software combines with superb hardware to unleash full eye tracking potential in the most intuitive way.
Bond your Hiru with consumer devices to have the best eye tracking experience in the most robust way.

Mamu: the first embedded eye tracking app, no hardware needed



A user can communicate and interact with the environment with the Tablet using just the eyes, thanks to the embedded camera


Bizkaia
ELANTARTIDA



Medical use of IRISBOND, today

We are already using our technology

Medical tenders. We are already working with some reference Public Hospitals in neurological diseases such as ALS to evaluate and prescribe our eye tracking device for those who have communication disabilities due to the disease.

We are partnering with global players in US, EU and in the UK to provide NHS Assistive Technology Solutions.

Other medical uses of eye-tracking

Diagnosis

&

Treatment

A non-invasive diagnosis and treatment that matches the movement of the eyes and the response in the brain to gather information about mental health by evaluating: where we look, visual fixation, relation of ideas, time spent, what we recall, etcetera.

An eye-tracker can diagnose and treat, among others

Neurodegenerative diseases

Alzheimer’s

Parkinson’s

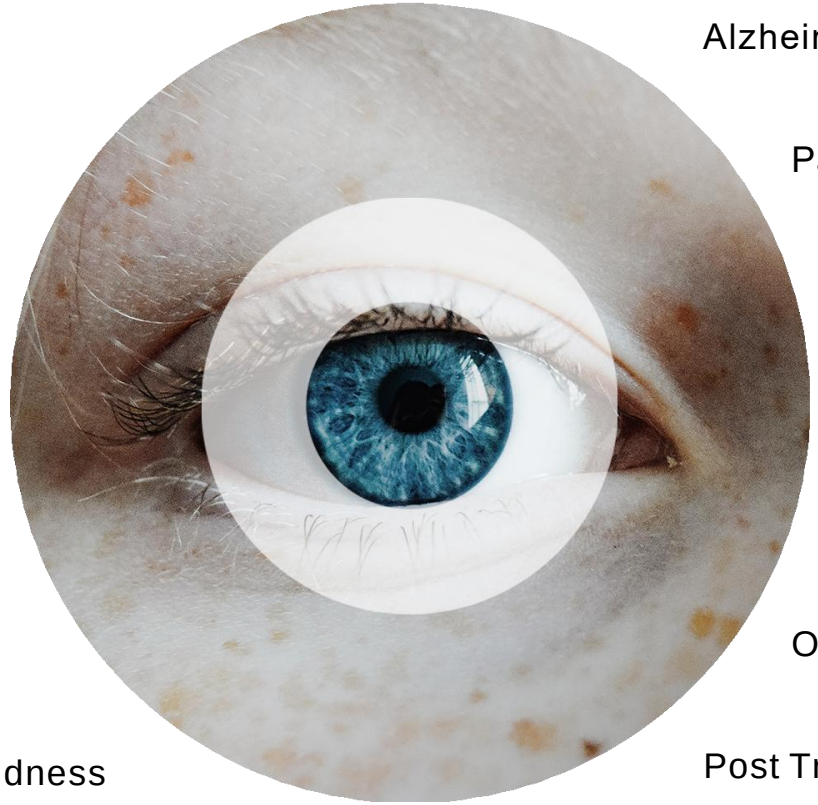
Cognitive process

Emotions detection

Schizophrenia

Oculomotor dysfunction

Post Trauma Vision Syndrome



Convergence insufficiency

Vision Therapy

Eye vision peripheral problems

Early diagnosis of severe nearsightedness

Vision diseases

One ET &

Internet connection is enough to check in real time:

- More than 30 neurodegenerative diseases
- Several vision problems
- Some psychological and psychiatric illness
- Telemedicine: follow brain or other treatm distance
- If there are any alerts in some patients
- For tele-neuropsychology

Benefits

- Healthcare becomes more affordable & accessible
- Healthcare is more personalized and treatments can be tested in real time
- Symptom management of chronic diseases is easier and a better care delivery with remote monitoring tools that collect patient data from their homes
- Telemedicine may reduce the duration of the average stay at a facility, such as a short-term rehabilitation stay
- Enhances independence of the elder and chronic patients

And a platform to hold and use all the knowledge for medical and research purposes

Data Generation

Measure eye movement responses to visual stimulations using eye-tracking technology & gather information.

- From research
- From doctors

Data Lake

AI algorithms analyze patients eye movements vs different diseases patterns in eye movement. INFORMATION IS NOT LINKED TO PERSONAL DATA.

Information Processed

Get a report and a verified protocol. The more information in the data base, the better understanding and accuracy.

- Diagnosis
- Treatments
- Patterns

- Age
- Sex
- Disease
- Medical History
- Values...

MedTech Eye-tracking Platform

Any questions? Happy to answer!

IRISBOND

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www.irisbond.com

See it Possible

Innovation in Digital Health and Healthy Ageing in Madrid

Ana Miquel, Officer for Innovation and International Projects, Secretary General Healthcare Research and Documentation, Health Department, Madrid Regional Government

#DigiFest2021 #DigiCare4Scot

1-2 December 2021

Digital Approaches to Active and Healthy Ageing

Shared Learning from the Fenin Ecosystem in Spain and Scotland

Dr. Ana Miquel Gómez
Head of Innovation and International Projects.
General Subdirectorate for Health Research and Documentation.
Directorate General for Research, Teaching and Documentation..
Madrid Health Council.

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Docencia y Documentación
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Comunidad de Madrid

Spanish National Health System

The **Spanish state** is made up of the central state and 17 decentralized regions named Autonomous Communities (ACs), with their own respective governments and parliaments.

The **ACs** are responsible for payment with public funds as well as healthcare budgeting and organization of service delivery.

The national **Ministry of Health and Social Policy** holds authority over certain strategic areas, such as pharmaceutical legislation, and is the guarantor of equitable functioning of health services across the country.

Spanish National Health System

- In the World Health Report 2000, which measured and compared health systems performance based on eight dimensions of attainment and performance (including health expenditure per capita), **Spain ranked 7th out of 191** countries in the world.
- Spanish citizens rate the quality of the healthcare that they receive **as “good quality"; this is 6 points higher than the EU average.**
- According to WHO’s world health statistics, in 2015 life expectancy at birth in Spain **was 82.8, the third highest in the world.** The top causes of death in Spain are disease of the circulatory system (30.1% of total deaths) and cancers (28.4%). Spain is among the 4 EU countries with the lowest death rate from ischemic heart disease and cerebrovascular disease.

Spanish National Health System

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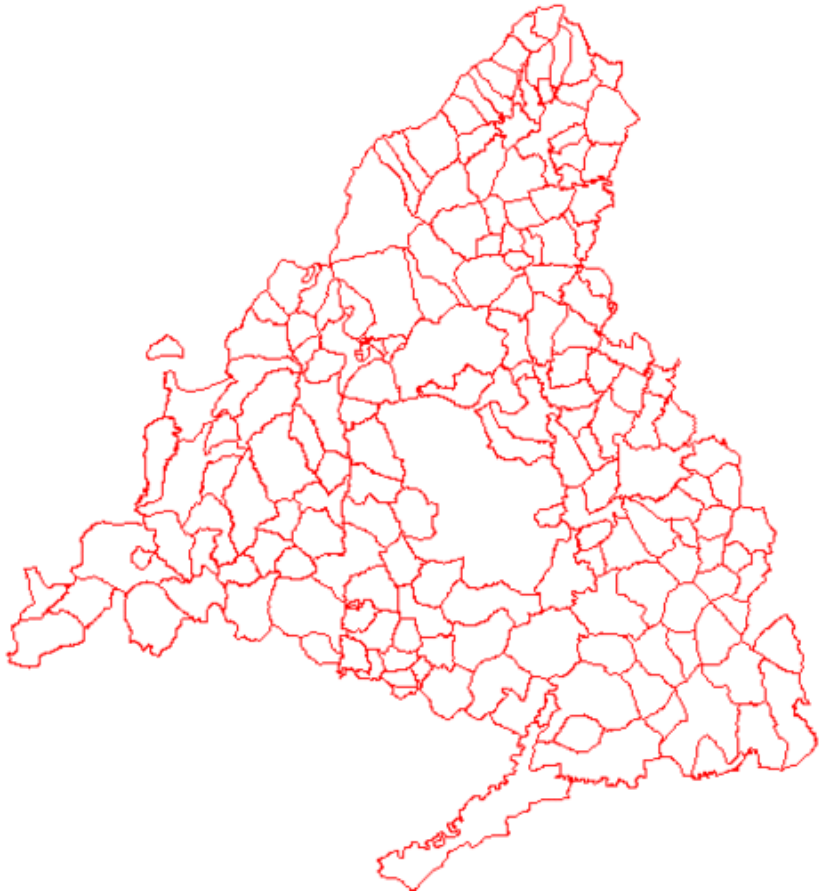
- The top causes of death in Spain are disease from the circulatory system (30.1% of total deaths) and cancer (28.4%). Spain is among the four European Union (EU) countries with the lowest death rate from ischemic heart disease and cerebrovascular disease.
- Healthcare accounts for 30% of ACs' total budget. Healthcare expenditure in Spain has followed the upwards international trend, reaching 9.1% of Gross Domestic Product (GDP) in 2014. Total expenditure per capita amounted to 2,058 Euros in 2014. Public healthcare is funded primarily through general taxation.
- In Spain, the more advanced regions have been pursuing integration, chronic care management, and promoting an overall culture of healthcare for their population, but with different strategies and a different package of policies, tools, and innovations in each region.

Community of Madrid

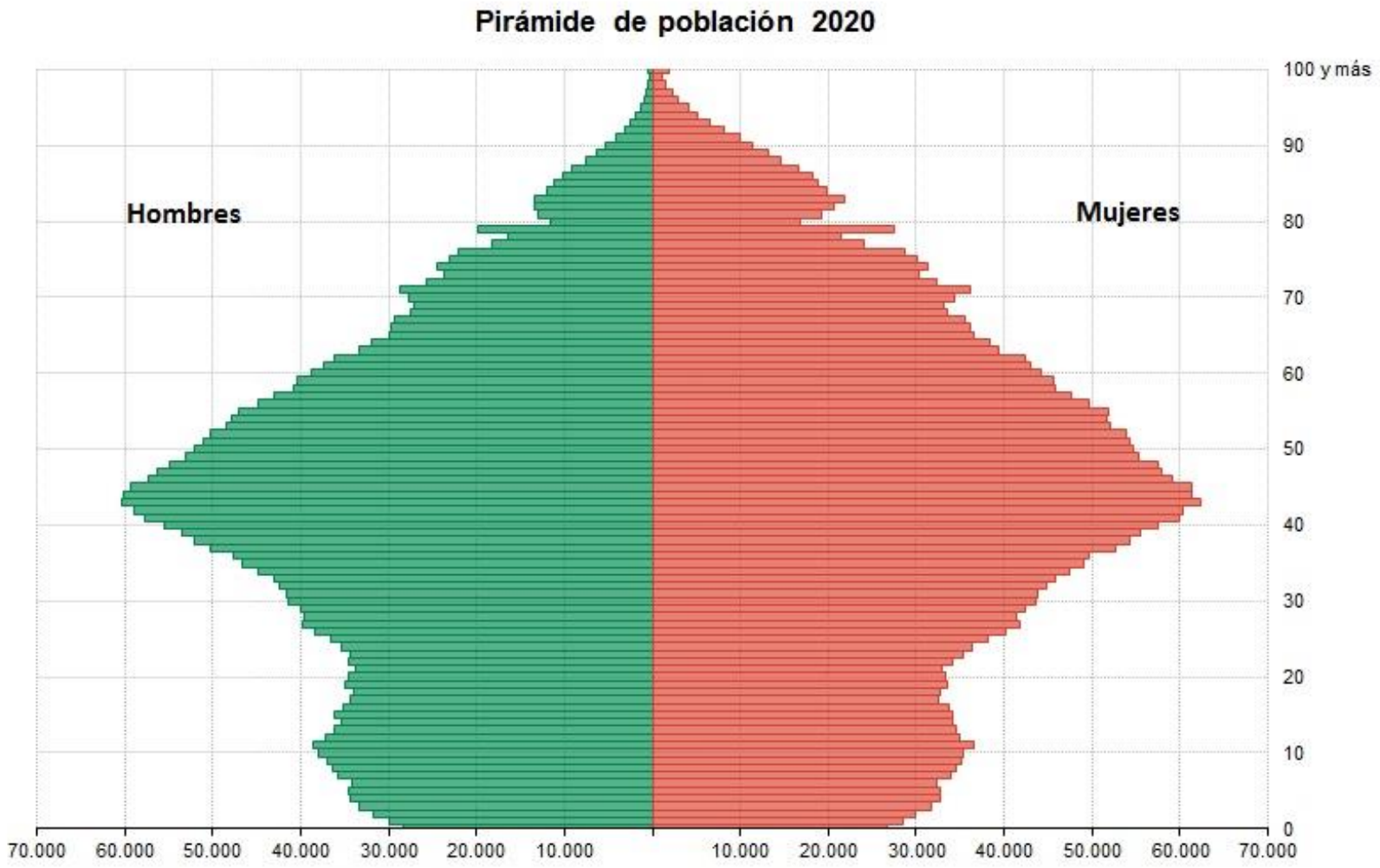


179 municipalities

Madrid region, with a population of almost 6.5 million inhabitants in a quite small geographic area, has one of the highest GDP / per capita of Spain, but also low public healthcare expenditure per capita (compared with other regions).

Community of Madrid

A remarkable statistic is that life expectancy is one of the highest in the world with 86.05 years in women and 81 years in men in 2020.



Community of Madrid

Servicio Madrileño de Salud

The Madrid Health Care Service (Servicio Madrileño de Salud – SERMAS) has a network of integrated and organized healthcare services including 430 primary care centres, 35 hospitals, public health, emergency services (SUMMA112) and 80,000+ professionals across primary and specialized care.

286 Basic Health Areas (BHAs) - 21875 inhabitants (IQR 11083) per area

UN Decade of Healthy Ageing

2021-2030

To foster healthy ageing and improve the lives of older people and their families and communities, fundamental **shifts** will be required not only in the actions we take but in how we think about age and ageing.

The Decade will address four areas for action:

- Age-friendly environments
- Combatting Ageism
- Integrated Care
- Long-term Care

World Health Organization

A new vision: Active and Healthy Ageing

Active and Healthy Living in the Digital World is a multi-stakeholder information and communication hub for European citizens, innovators, patients, health and care providers, researchers and policy makers engaged in research and innovation, deployment, exchange and dissemination of best practices, innovative solutions, scientific collaboration and policies related to active and healthy living and aging with digital tools.

It builds on the achievements of the European Innovation Partnership on Active and Healthy Ageing and promotes active and healthy living throughout the life-course.

European Commission

Our vision: Active and Healthy Ageing

Healthy aging throughout the life cycle, including:

- Intergenerational support.
- From promotion to greater support for the vulnerable elderly,
- In any environment including the work environment and of course the family and community.
- Integrated care, breaking again the fragmented vision that accompanies health and social systems.
- The active role of people who must mark their life itinerary,

These elements represent challenges for this decade.

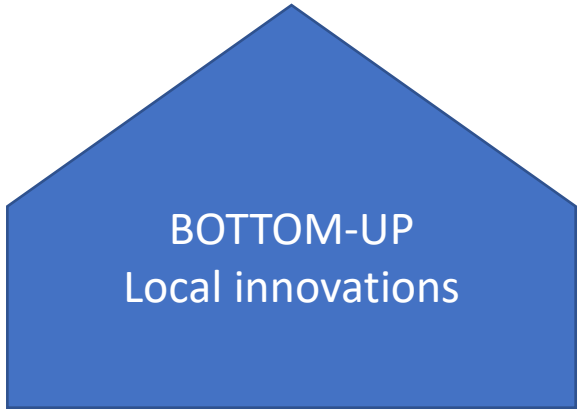
Community of Madrid - Care strategy for people with chronic diseases in the Community of Madrid

OBJETIVES

- Reduce the prevalence of chronic health conditions and limitations in activity.
- Reduce premature mortality in people who already have any of these conditions
- Prevent the deterioration of functional capacity and the complications associated with each process.
- Improve their quality of life and that of caregivers.

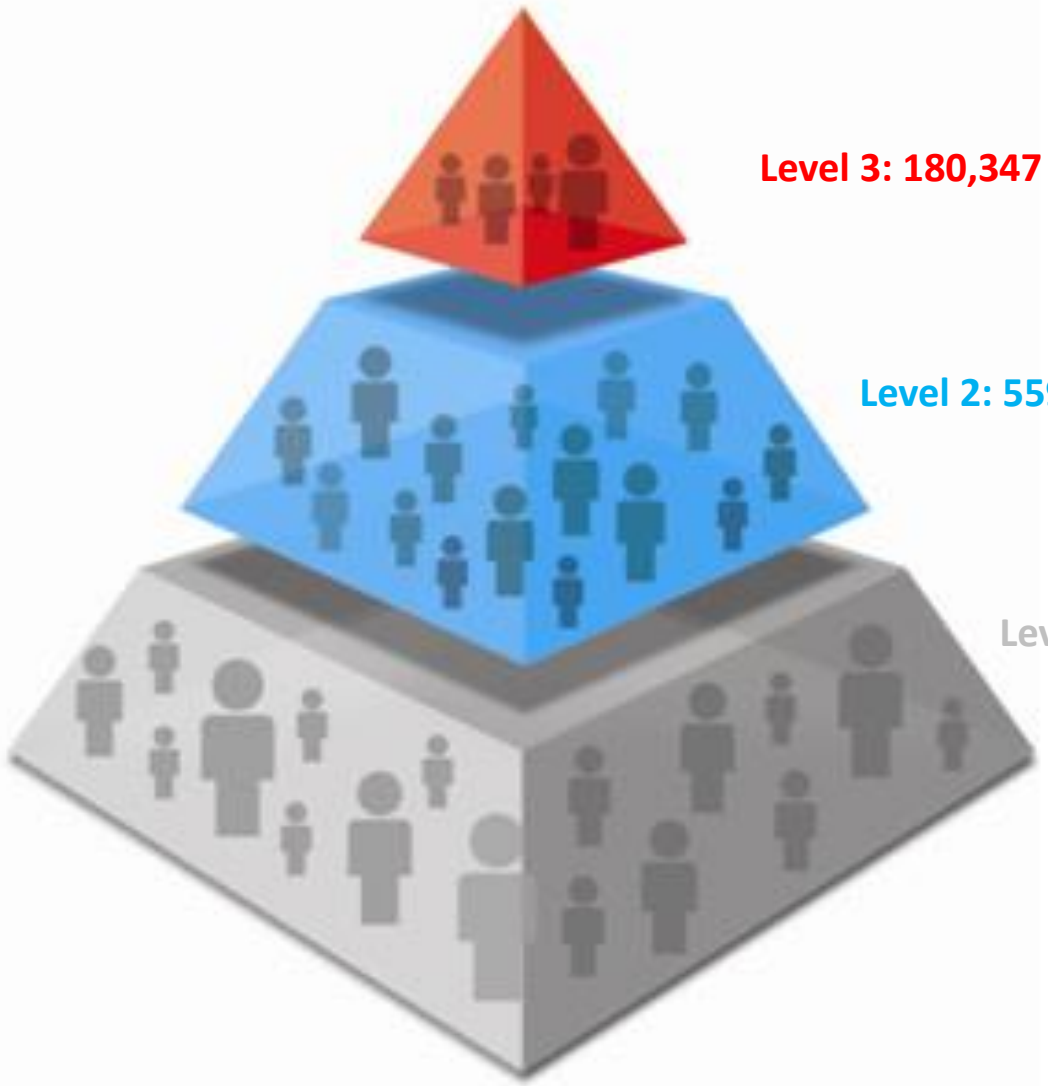
Implementation approach

- **STRATIFICATION**
- **ADAPTATION TO PROTOCOLS**
- **ELECTRONIC HEALTH RECORD AND PERSONAL HEALTH FOLDER**
- **SCHOOL OF PATIENTS**
- **ELECTRONIC PRESCRIPTION**



- **MAPS OF ACTIVE HEALTH RESOURCES**
- **VALLECAS ACTIVA**
- **HEALTH AND SOCIAL CARE COORDINATION**
- **BOTTOM-UP INNOVATION PROJECTS (150+, 2010-2015)**

Strategy of care for patients with Chronic Conditions: The implementation



Level 3: 180,347

Level 2: 559,129

Level 1: 3,009,219

STRATIFICATION

Total población crónica
3,748,695 (55.54 %)

Strategy of care for patients with Chronic Conditions: The implementation

- Health program for children
- Vaccination for children and adults
- Woman programs
- Promotion of health
- Early detection of Chronic conditions
- Hypertension
- Diabetes
- Hypercholesterolemia
- Obesity (children/adults)
- Ischemic heart disease
- Heart failure
- Asthma (children/adults)
- COPD
- Elderly, fragile or functional impaired
- Dementia
- Palliative care

Early Detection and Prevention

Adaptation of protocols to the level of intervention

Strategy of care for patients with Chronic Conditions: The implementation

PERSONS WITH INDIVIDUAL PLANS ADAPTED TO NEEDS (PROTOCOLYZED): 1,391,810
COMPLEX PATIENTS WITH SPECIFIC PATHWAY: 17,939

		NIVELES DE INTERVENCION A 28-2-2019				
		3-ALTO	2-MEDIO	3-BAJO	0-PPS	TOTAL
RIRKS LEVELS 31-12-2017	3-HIGH	13,463	77,503	26,664	897	118,527
	2-MEDIUM	3,286	136,766	177,831	10,733	328,616
	1-LOW	1,190	54,716	646,261	242,500	944,667
		17,939	268,985	850,756	254,130	1,391,810

Strategy of care for patients with Chronic Conditions: The implementation

SCHOOL OF PATIENTS.
SUPPORT TO CAREGIVERS.

SHARED ELECTRONIC HEALTH RECORD.
ACCESS TO PATIENTS.

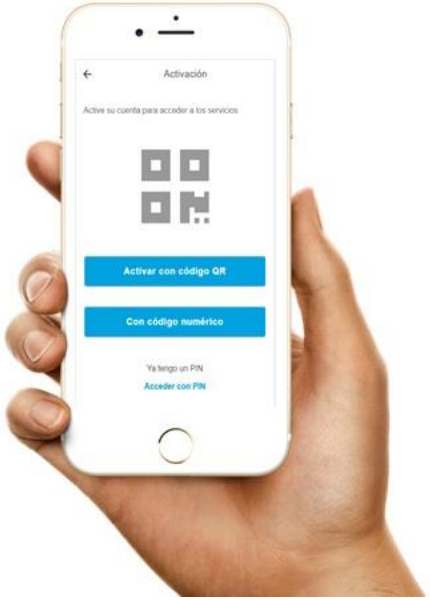
ESCUELA MADRILEÑA DE SALUD

Digital Transformation - Virtual Health APP

Comunidad de Madrid

Servicios e información | Cultura y turismo | Inversión y empresa | Acción de gobierno

Servicios e información / Salud / Tarjeta Sanitaria



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Mapping by Carabanchel Alto

… Or how to protect and improve our health in the neighbourhood-district

Vallecas Activa Project

The European JA-CHRODIS program report contains 41 examples of good practice from 13 partner countries. "Vallecas Activa" is one of them

Structure for innovation

Health Research Institutes in the Community of Madrid

There are 8 accredited Health Research Institutes whose main mission is to carry out research of the highest quality, carrying out the transfer of basic research, clinical, epidemiological, health services and public health, to the National Health System, to patients and society.

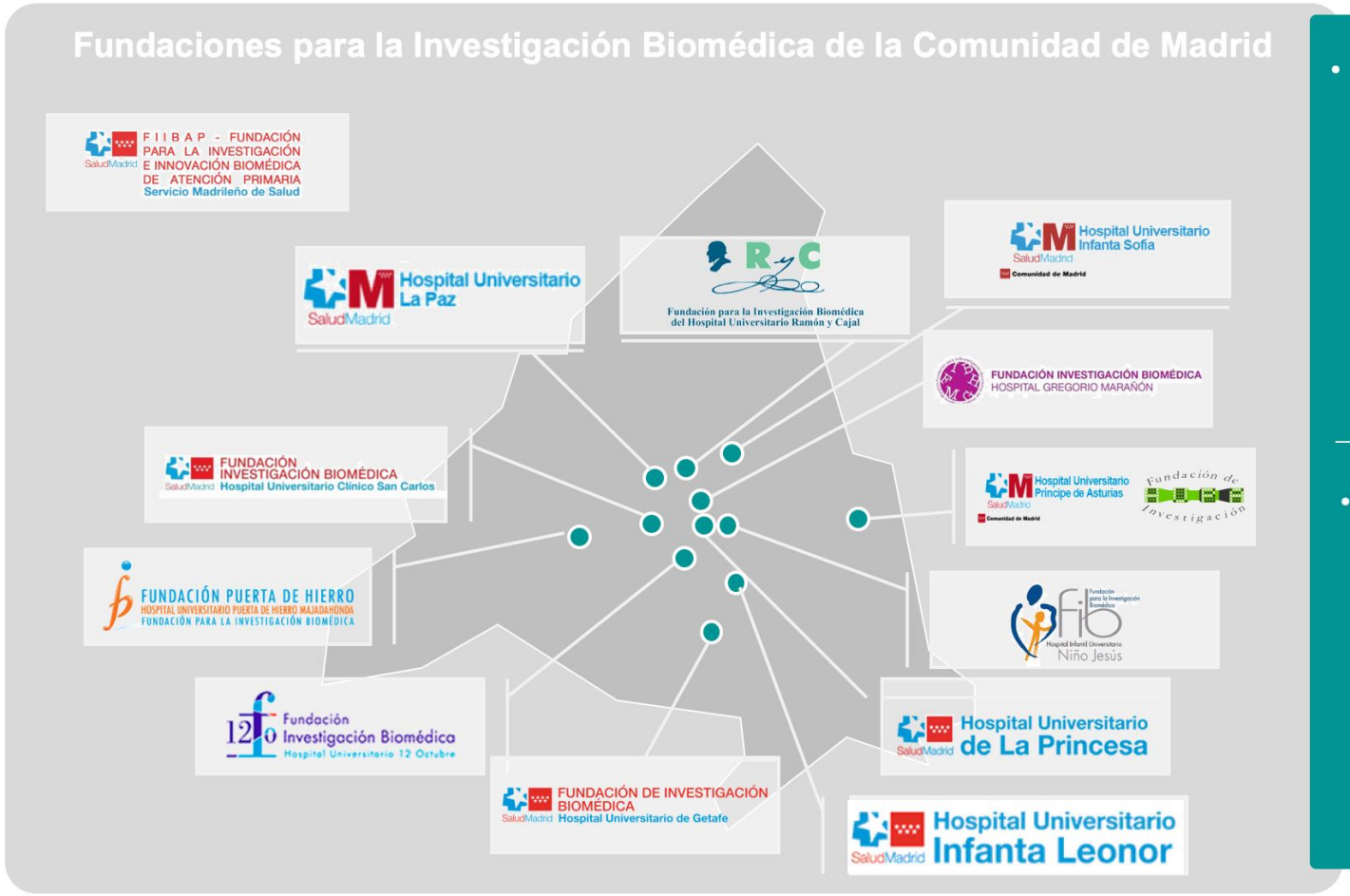
- Los Institutos de Investigación Sanitaria son la asociación formada entre universidades, centros de investigación y agrupaciones empresariales, todos ellos en torno a un hospital de referencia
- Todos ellos cuentan con equipos con las tecnologías más avanzadas.
- Los Institutos constituyen el entorno perfecto para la transferencia del conocimiento científico a la práctica clínica, creando una excelente fuente de innovación en el área de la salud.

Source: Unidad Técnica de Apoyo a Programas Europeos (UTAPE). I+D+i en el Servicio Madrileño de Salud (SERMAS. Dirección General de Investigación, Docencia y Documentación. CONSEJERÍA DE SANIDAD. Madrid, mayo 2020.

Structure for innovation

Biomedical Research and Innovation Foundations in the Community of Madrid

13 public foundations are established with the aim of promoting scientific-technical research and innovation in both the hospital and primary care fields of the region



- Las FIB se constituyen en los **hospitales** para gestionar programas y **proyectos** de **investigación** biomédica y clínica, que contribuyan a la **protección** y **promoción** de la **salud** así como al progreso y **mejora** del **sistema sanitario**

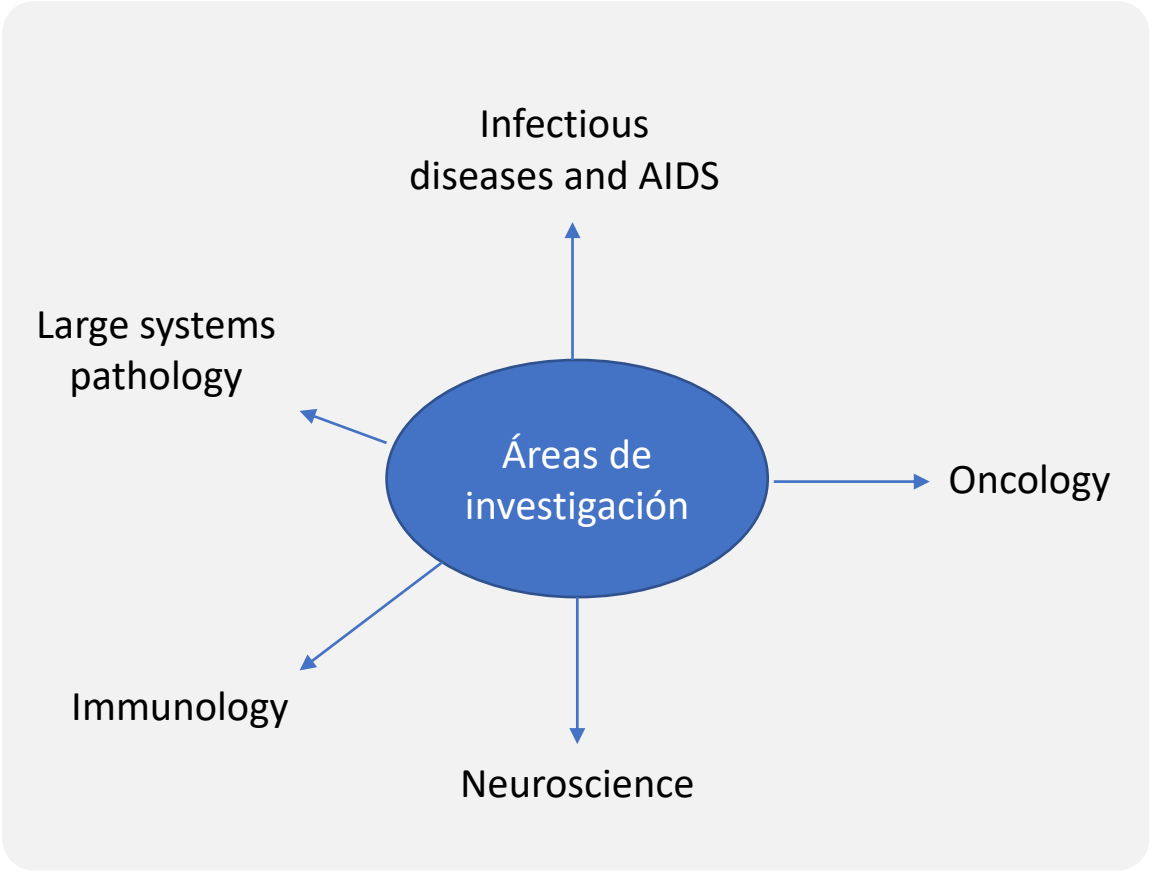
- La FIIBAP tiene como finalidad promover la investigación y la innovación científico- técnica en el campo de la **atención primaria** de salud con el fin de potenciar la **calidad asistencial** en los **centros** sanitarios dependientes del **SERMAS**

Source: Unidad Técnica de Apoyo a Programas Europeos (UTAPE). I+D+i en el Servicio Madrileño de Salud (SERMAS. Dirección General de Investigación, Docencia y Documentación. CONSEJERÍA DE SANIDAD. Madrid, mayo 2020.

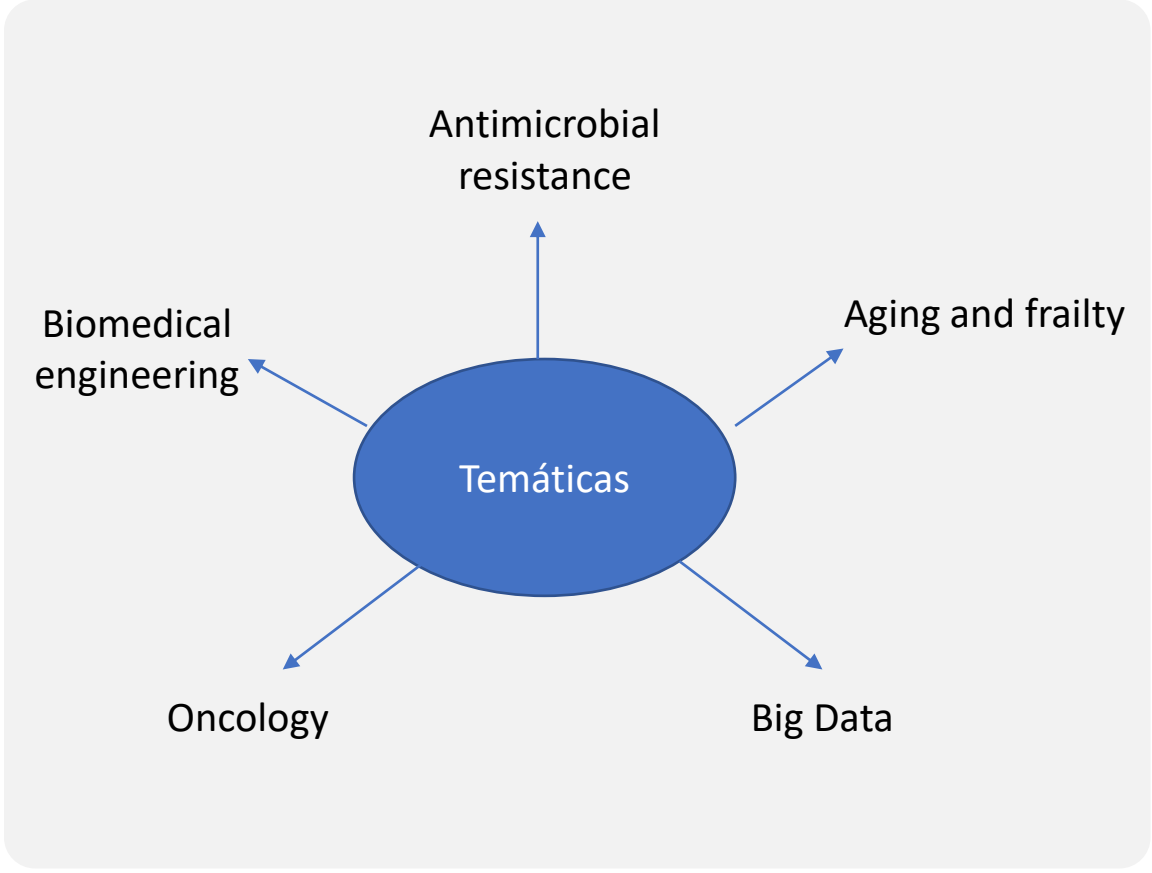
R + D + i Areas

Biomedical Research and Innovation Foundations in the Community of Madrid

SERMAS achieves a prominent position in the field of care for the elderly, including the prevention of frailty, active life and e-Health, both in the national and European context



There are 5,582 health professionals working in 370 research groups in public biomedical research foundations



Source: Unidad Técnica de Apoyo a Programas Europeos (UTAPE). I+D+i en el Servicio Madrileño de Salud (SERMAS. Dirección General de Investigación, Docencia y Documentación. CONSEJERÍA DE SANIDAD. Madrid, mayo 2020.

Innovation
Process map

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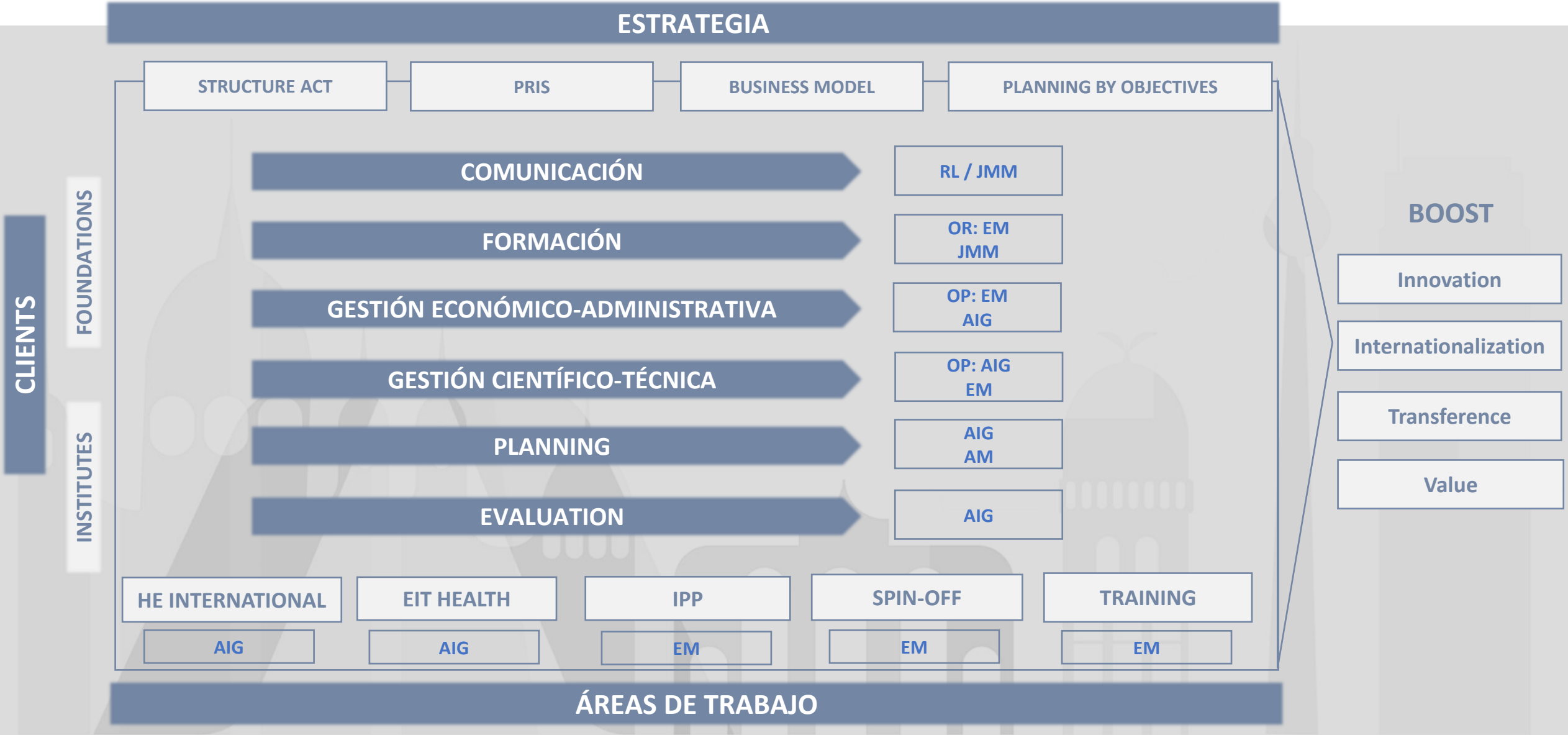

Strategic framework

Regional Health Innovation Plan of the Community of Madrid (2018-2020)

- Very important direct **economic contribution** made to the **research foundations** of large hospitals and Primary Care.
- Beginning of the development of a **Professional Career model** for research staff, or the creation of Innovation Units.
- Existence of initiatives to **share good practices** and **innovative ideas**.
- Design and implementation of **Integrated Care Processes**, as well as other actions to **promote Integrated Care**.
- Enhancement of **quality and patient safety**, and transparency in the dissemination of results.
- Initiation of **Public Procurement of Innovation projects** as initiatives that contribute to innovation and the development of the business fabric.
- Execution of an **oncology equipment renewal program**.
- Boost given to the **development of information systems**: results observatory, central clinical or diagnostic imaging repository, IT Web, remote consultation systems, and development of new applications and functionalities open to citizens ("My Health folder").
- High degree of **commitment and good performance** of most of the Departments, in seriously adverse circumstances.

BORRADOR

Our innovative actions - EIT Health

Funded by the European Union

	EIT Health BP 2020	EIT Health BP 2021	EIT Health BP 2022
Hospital Clínico San Carlos; FUNDACIÓN DE INVESTIGACIÓN BIOMÉDICA Hospital Universitario de Getafe; Fundación Investigación Biomédica Hospital Universitario 12 Octubre; Hospital Universitario La Paz; FIIBAP - FUNDACIÓN PARA LA INVESTIGACIÓN E INNOVACIÓN BIOMÉDICA DE ATENCIÓN PRIMARIA Servicio Madrileño de Salud; Fundación para la Investigación Biomédica del Hospital Universitario Ramón y Cajal; FUNDACIÓN PARA LA INVESTIGACIÓN E INNOVACIÓN BIOMÉDICA Hospital Universitario Infanta Leonor Hospital Universitario del Sureste; FUNDACIÓN INVESTIGACIÓN BIOMÉDICA HOSPITAL GREGORIO MARAÑÓN; INSTITUTO DE INVESTIGACIÓN SANITARIA PUERTA DE HIERRO - SEGOVIA DE ARANA Hospital Universitario Puerta de Hierro Majadahonda	**10** FUNDACIONES	**8** FUNDACIONES	**5** FUNDACIONES
	14 PROYECTOS	**9** PROYECTOS	**5** PROYECTOS
	1.400.000 EIT GRANT	**547.034,50€** EIT GRANT	

ONCOMMUN; AF-FINE; Chronic Pain Innovation; CLAIRE; VALUE; HPG; Catalyst Europe Education; URB_HealthS Education; Rehab+; SOFTBONE; BRAINI Innovation; INCAP; UPrAIHSe; PREDIRA Innovation; Better@Home Innovation; POSITIVE; iRaise

Our innovative actions - EIT Health

EIT Health (last 3 years)

Acrónimo	Descripción	Área temática
AF-FINE	AF-FINE: artificial intelligence drive platform for atrial fibrillation stratification	Chronic diseases
Better@home	Integrated care solution for patients hospitalized at home, enabled by digital technology	Integrated care / Chronic diseases
CHRONIC PAIN	Electrical Quantitative Sensory Assessment System for Failed Back Surgery Syndrome	Chronic diseases
HPG	HemoPlug	Chronic diseases
INCAP	INCAP - Integrated care program for Type 1 Diabetes Mellitus patients with insulin pump	Integrated care / Chronic diseases
ONCOMMUN	"Oncommunities": online cancer support communities	Integrated care / Chronic diseases
POSITIVE	maintaining and imPrOving the intrinSIc capaciTy Involving primary care and caregiVErs	Integrated care / Chronic diseases / Active and Healthy Ageing
PREDIRA	PRediction mEdical DevIce for Rheumatoid Arthritis	Chronic diseases
R+	Rehab +	Integrated care / Chronic diseases
SOFTBONE	Soft bone cement for better treatment of osteoporotic fractures	Chronic diseases
VALUE	VALUE - Value based healthcare supported by process mining tools	Integrated care / Chronic diseases

Our innovative actions - Spin-offs

Nombre	Ámbito de actividad	Área temática
Biomedica Molecular Medicine (BMM)	Biotech (cellular therapy)	Chronic diseases
T-CELL THERAPEUTICS	Biotech (cellular therapy)	Chronic diseases
LUCADIA (provisional name)	Biotech (cellular therapy)	Chronic diseases
DILUBIO (provisional name)	Medical device	Chronic diseases
HEPOCAA (provisional name)	App	Chronic diseases
(chatBot Fumadores)	App	Integrated care / Chronic diseases
MG Biomed (provisional name)	App, medical device, integrated care services	Integrated care / Chronic diseases / Active and Healthy Ageing
Altum Sequencing SL	Biotech	Chronic diseases
FORCHRONIC	Health	Integrated care / Chronic diseases
TELARA Pharma SL	App / Drug developement	Chronic diseases
CORIFY CARE SL	Medical device	Chronic diseases

Innovative Public Procurement Actions

FID-2

Acrónimo	Descripción	Área temática
ZIKAD	ZIKV diagnosis and detection system	Chronic diseases (prevention of complications)

FID-3

Acrónimo	Descripción	Área temática
INTEGRACAM	Development service of an ICT model for the improvement of the intrinsic capacity of the elderly	Integrated care / Chronic diseases / Active and Healthy Ageing
INFOBANCO	Development service of a health data architecture solution for your continuous learning	Integrated care / Chronic diseases
MEDIGENOMICS	Platform and expert system for genomic studies	Integrated care / Chronic diseases

H2020

Acrónimo	Descripción	Área temática
iPSPCP	iProcureSecurity – Soluctions for Emergency Medical Services	Integrated care

innovacion@salud.madrid.org

Dr. Ana Miquel Gómez
Head of Innovation and International Projects.
General Subdirectorate for Health Research and Documentation.
Directorate General for Research, Teaching and Documentation..
Madrid Health Council.

December 1st, 2021

Dirección General de Investigación,
Docencia y Documentación
CONSEJERÍA DE SANIDAD
Comunidad de Madrid

Introduction to Information Processing and Telecommunications Center

Rubén San Segundo, University of Madrid – IPTC

Information Processing and Telecommunications Center

Technologies for creating high economic and social value

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Who We Are

ICT at Universidad Politécnica de Madrid

The **Information Processing and Telecommunications Center** was created in 2016 to bring together the expertise and resources of a number of highly competitive research groups working in the fields of **Electronics, Communications, Networks, Computing and Software**.

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IPTC in facts and figures

1.

180 researchers

Bringing expertise in different areas of knowledge on ICT.

2.

107 competitive research projects

In national and international R&D and innovation competitive programmes.

3.

70 research contracts

Solving the needs of industry partners and contributing to value creation and innovation.

4.

283 journal and conference papers

High quality research outcomes challenging and advancing the state-of-the-art.

5.

13 Ph.D. thesis

Doctoral works on hot topics per year

What We Do

Applied and Basic Research, Innovative Engineering Solutions, Advanced Consulting Services

Center's strategic areas

- Future telecoms
- Smart cities
- Defense and space
- Health and wellbeing
- Connected Industry
- Mobility and transport
- Data engineering & digital transformation
- Interaction and interfaces

Groups´ core technologies

- Electronics and systems
- Radio and wireless
- Multimedia technologies
- Networks and Cyber
- Statistics and Signal and Comms Theory
- Data Science and Engineering

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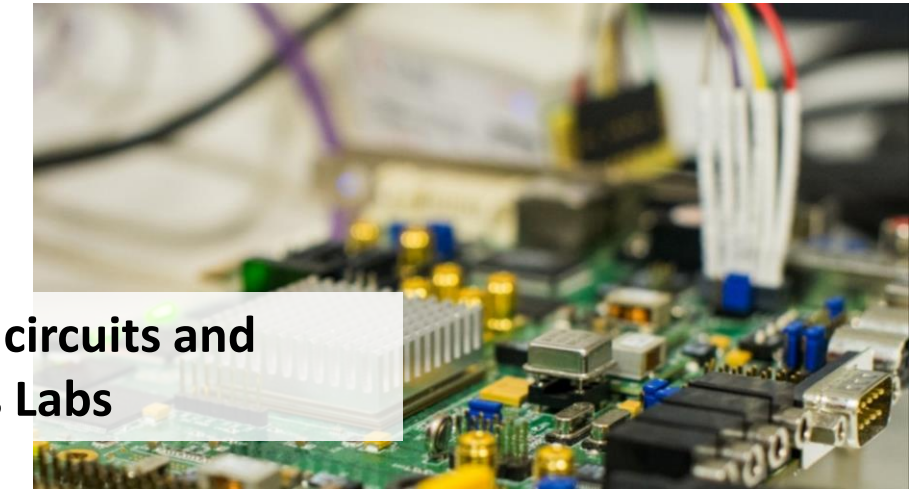
Facilities and infrastructures

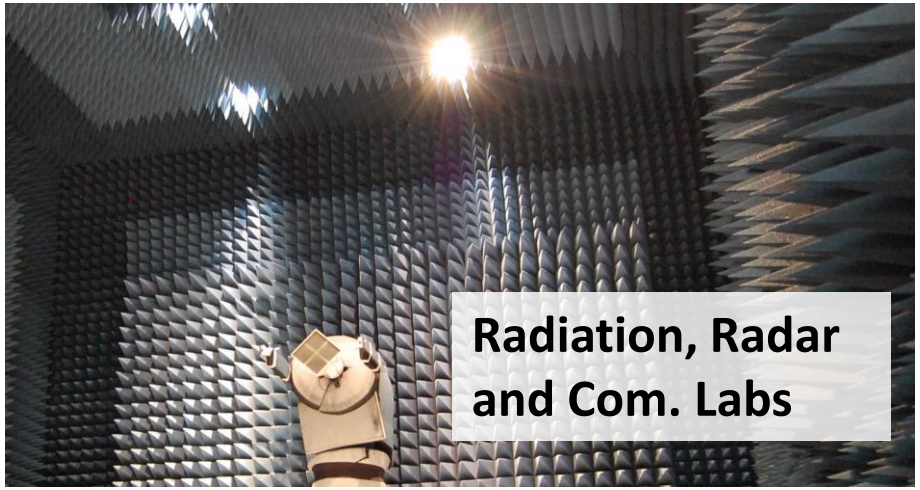
Enabling research, prototyping, user testing

Multimedia technologies Labs

Living & Experience Labs



Integrated circuits and electronics Labs



Radiation, Radar and Com. Labs

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ICT Technologies for Health and Wellbeing

Biomedical Imaging Technologies

Human Sensing and Mobile Applications

Big Data Analytics and Architectures

Speech and Natural Language Processing

Advanced Multimedia Management and HCI

Platforms for independent living and integrated care

Process Optimization

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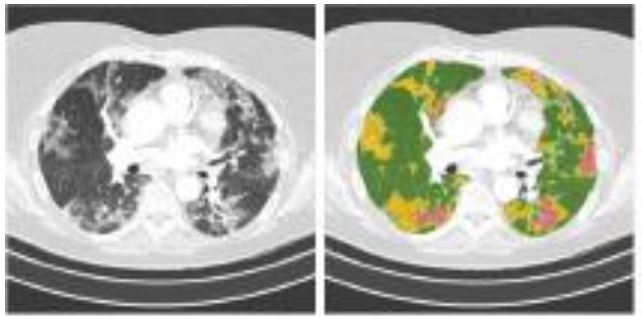
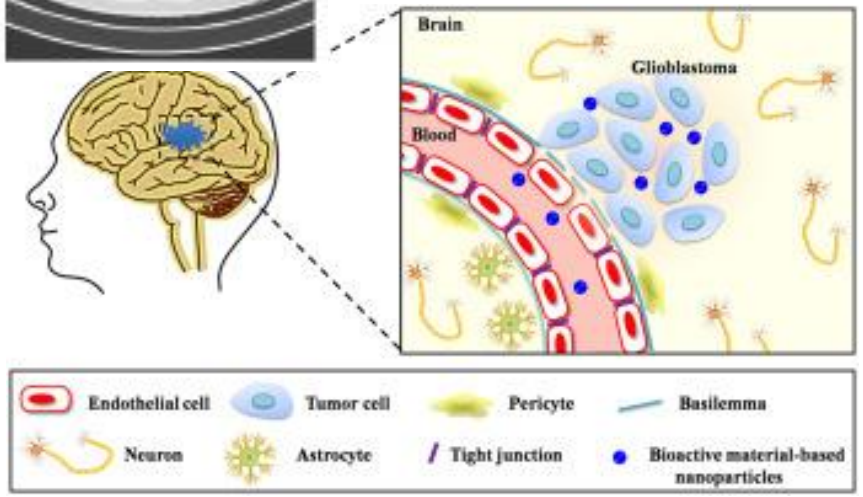
Biomedical Imaging Technologies

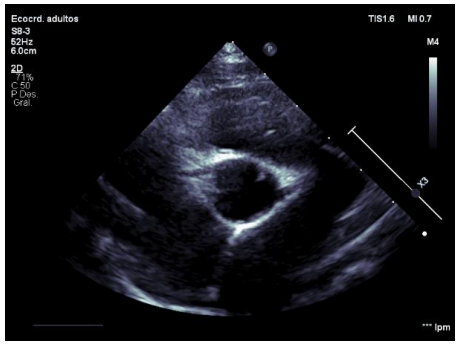
- Detection of pulmonary disorders



- Multiparametric MR for non-invasive Glioblastoma therapy



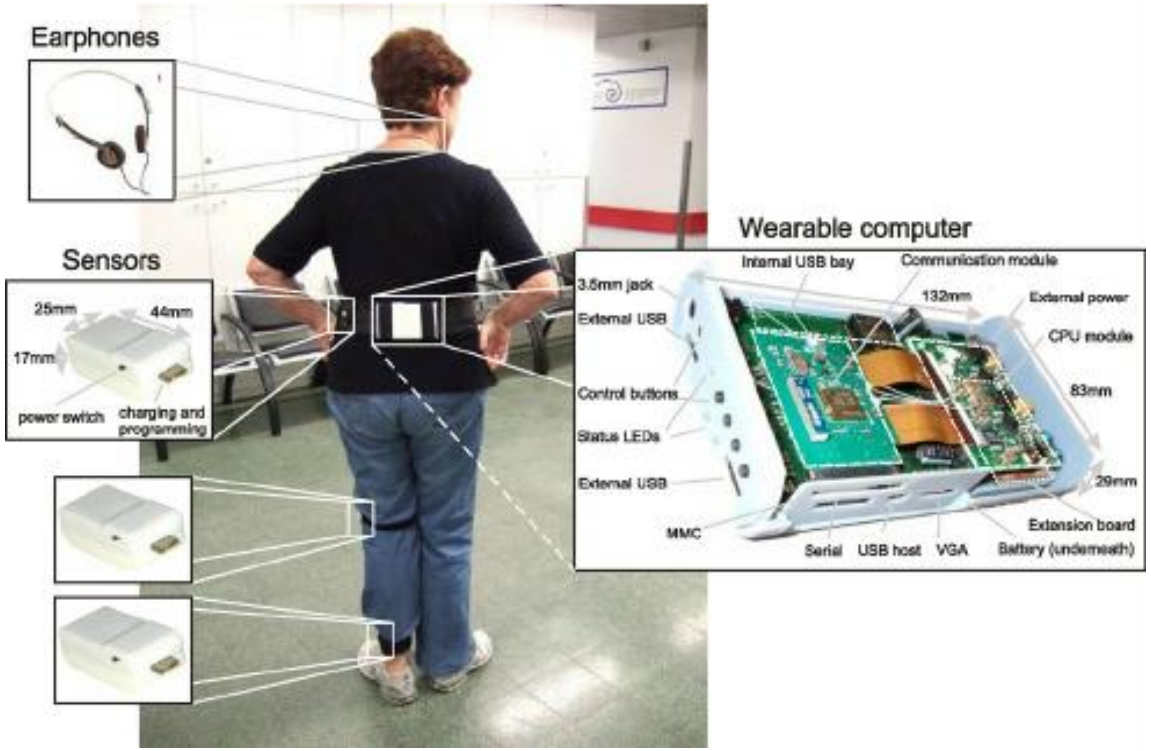
- Deep Learning for Kawasaki Disease analysing Echocardiograms



- Detection of altered brain oscillations
- **Start-ups**: Leuko labs and Spot lab

Human Sensing

Health & Wellbeing
Parkinson supervision



Human Behaviour
Behaviour, identity and intention detection

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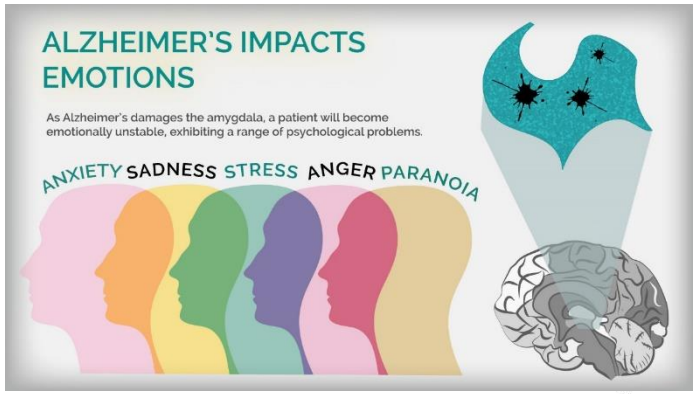
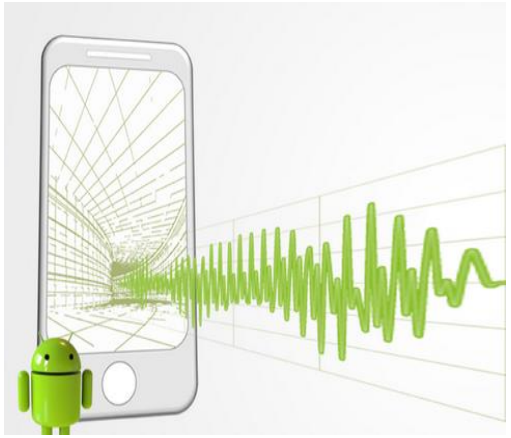
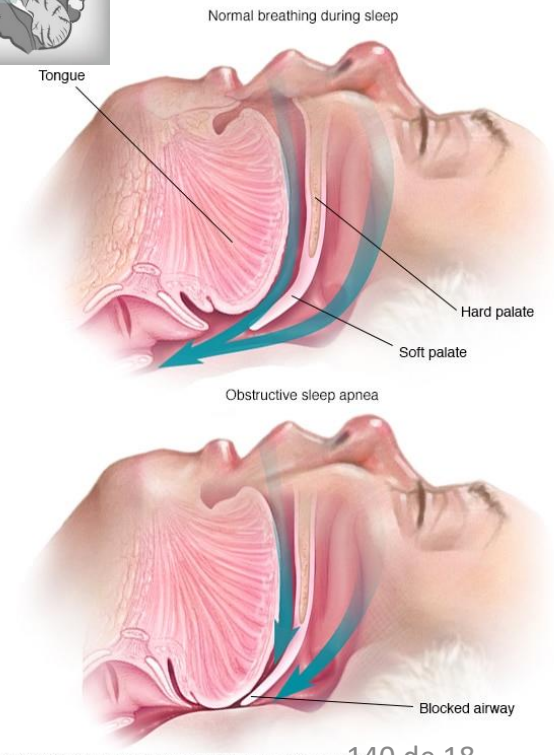
Speech and Natural Language Processing

- **Apnea detection from speech**
- **Emotion analysis in neurological diseases**





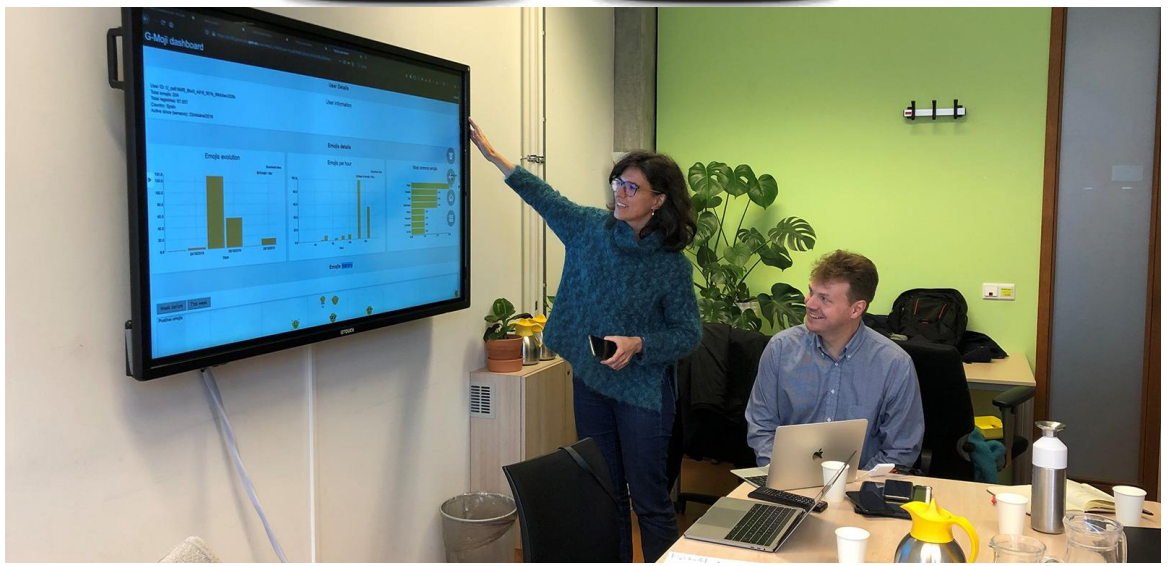
Emotion recognition system from voice features (ESAI): ML application to multimedia datasets to extract emotion information from voice features.



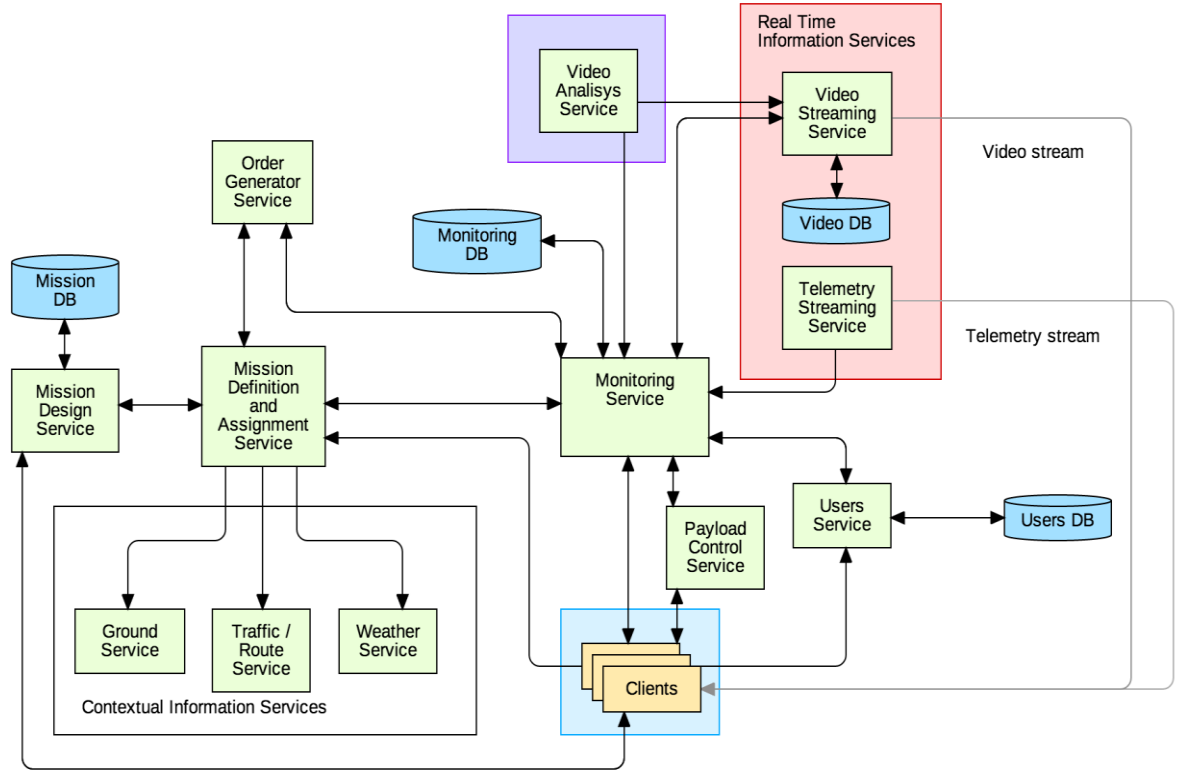
Human Sensing, Mobile Applications and Big Data

Gmoji. G-Moji: self-help in the palm of your hand for youth at risk

Technologies/approach: Real time sensor analytics platform for digital phenotyping applied to mental health (and others).
Sectors: **Health, mobile worker**



Drone fleet management for emergency response



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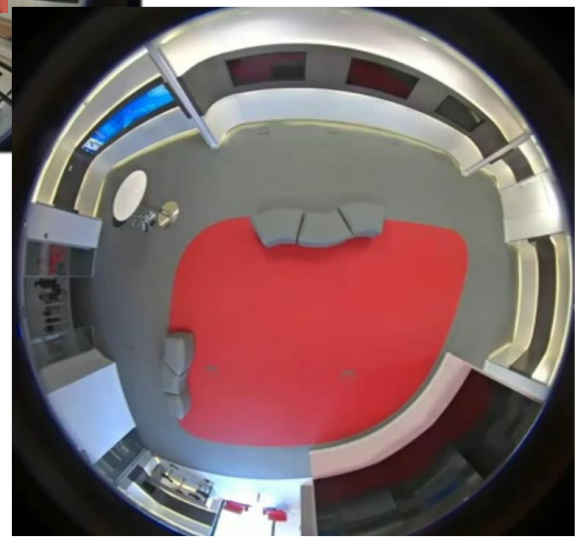
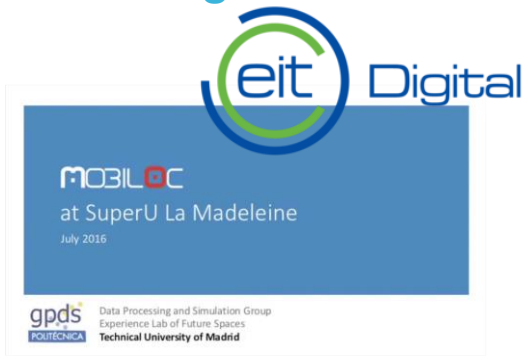
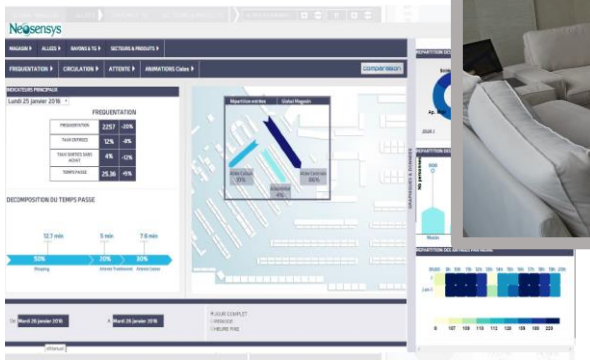
Smart spaces technologies

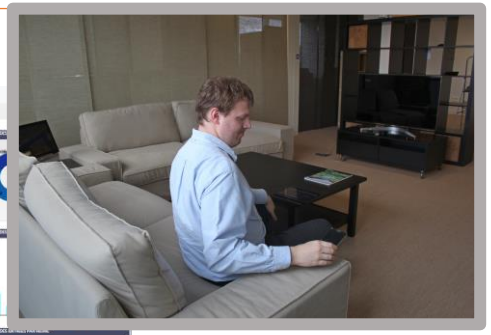
- **Human tracking and human activity recognition using video processing**



- **Using IoT**







CDTI Centro para el Desarrollo Tecnológico Industrial

THOFU: Technologies for the HOtel of the Future.
Technologies/approach: IoT architectures, smart objects, mobile-centred services. Smart spAce Manager (JSON syntax, multiple sensors, smart space controller, DLNA, multiuser, etc.) enables customizing scenes and delivering contents in a smart space. Light-weight WoTOP.
Sectors: Among others, **Health-related service delivery in hotels, Elderly**

Brick&mortar Cookies: Positioning technologies and behaviour analysis for smart spaces (shopping malls, supermarkets, hospitals, etc.).
Technologies/approach: IoT architectures, data fusion, e-RSS (HMM, others), multisensory proximity detection for interaction.
Sectors: **Retail, health**

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Platforms for independent living and integrated care

TeNDER: affecTive basEd iNtegrateD carE for betteR Quality of Life

PROCareLife: PeRsOnalized Integrated CARE Solution for Elderly facing several short or long term conditions and enabling a better quality of LIFE

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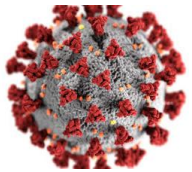
IPTC research for COVID-19

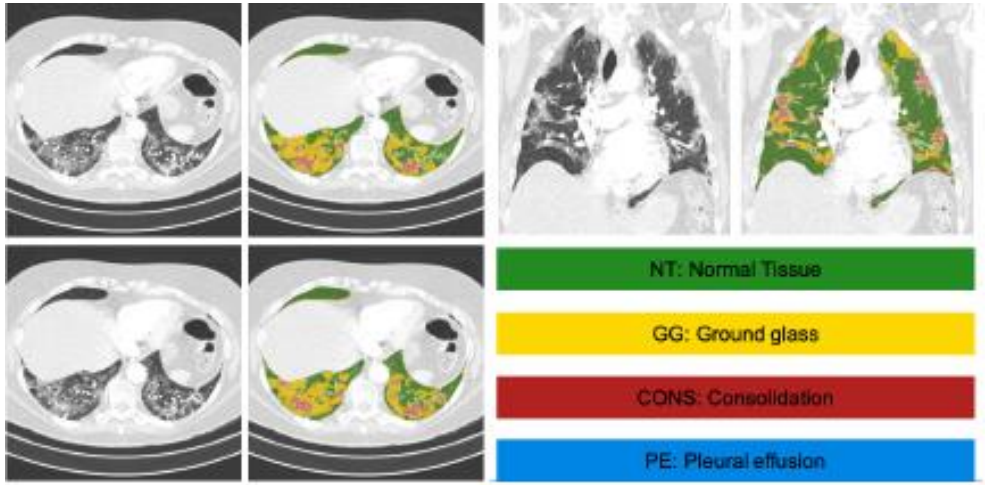


Some internal activities promoted by IPTC during the pandemic.

Quantification of lesions and aid in diagnosis

Object | Objective and fully automatic quantification of lung lesions from Computerized Tomography and improvement of the prediction of ICU admission, need for mechanical ventilation and mortality. In collaboration with 4 hospitals.

Technology | AI, image analysis with DL



Images: IPTC

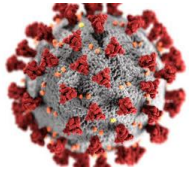
Blockchain technologies applied to the management of Digital Green Certificate for mobility

Object | Development of the Digital Green Certificate concept to facilitate mobility in the EU during the COVID19 pandemic. CVD must allow citizens to show verifiable proof of their disease status (vaccinated, recovered from disease, negative PCR tests, etc.). CVD must be secure, interoperable and verifiable throughout the European Union.

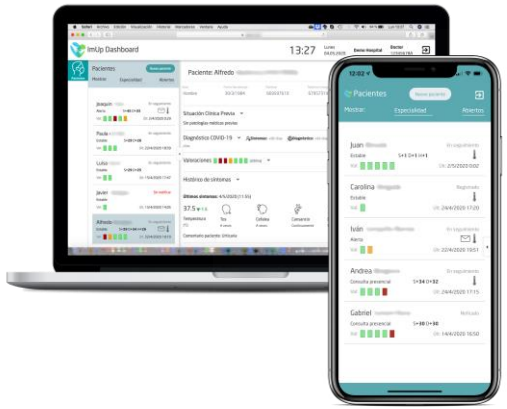
Technology | Based on distributed ledger technologies, the principles of self-sovereign identity, the Sovrin infrastructure, the Hyperledger ecosystem of blockchain technologies and the W3C specification for Decentralized Identifiers (DIDs).

Image: Unsplash, by @lukassfr

IPTC research for COVID-19



Some internal activities promoted by IPTC during the pandemic.



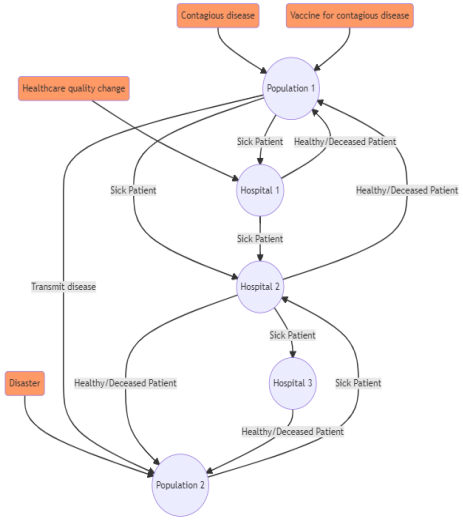
Images: IPTC

Personal health and data analysis for tracking and monitoring of COVID patients, and other mobile-supported services

Object | Systems, proofs of concept and applications developed on and for mobile devices, with the aim of supporting, in some aspect, the fight against COVID-19. Among others, they include those developed to facilitate the follow-up and monitoring of people, control of the evolution of the pandemic, those aimed at self-diagnosis and especially those for healthcare or clinical use.

- IMUP: Intelligent Manager for Ubiquitous Personal Mobile Care. Project with its own funding, provides doctors with a remote symptom monitoring service through patients' mobile devices; and to these an active and close channel of communication. Developed in collaboration with reference hospitals in the Community of Madrid.
- Mobile tracking applications for global movement monitoring and BT-based indoor contact tracking.

Technology | Architectures and apps for personal health, 5G and IoT application development infrastructure, AI techniques and data analysis.



Simulation of the spread of the epidemic and its effect on health infrastructures

Object | Statistical simulation system of the spread of the pandemic and its variants and its effect on critical resources of health infrastructures: occupation (plants, services, ICU, respirators), quality of care, overload measures, effect on other resources (hospitals, primary care, etc.).

Technology | Software developed in Python and Mesa, based on agents, Bayesian networks and other paradigms. Ready for demonstration.

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R&D and innovation in health and wellbeing solutions

- Competencies in very diverse ICT-related fields to generate **integrated solutions**.
- Highly **specialized human resources for specific problem solving** (e.g. in the fields of data analytics, media management, IoT, algorithms, biomedical images, communications, etc.).
- Declared interest and competencies in data-driven solutions, based on **machine learning, deep learning and other artificial intelligence** knowledge fields.
- **Experience in collaboration with clinical partners**.
- Validation of technical solutions with **users**.
- Active participation and coordination of **R&D projects**.

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Director del IPTC

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Q & A and discussion

Joanne Boyle, Digital Health & Care Innovation Centre

Final comments

Joanne Boyle, Digital Health & Care Innovation Centre

Funding Opportunities

- All our current funding opportunities are available on the HAIC webpage: https://www.dhi-scotland.com/innovation/innovation-clusters/healthy-ageing/

Next HAIC event

- February 2022 in partnership with Brain Health and UOS
- Brain Health is hosted by Alzheimer Scotland
- Programme funded by Scottish Government with an emphasis on prevention
- Design led workshop opportunity for HAIC members to input
- Further details to be confirmed

Final comments

- Thank you to all of our speakers today
- So much information- all recorded and presentations will be made available for further reference
- Health Ageing Innovation Cluster members asked for examples of best practice from other areas- Thanks again to Fenin and SDI for sharing this collaborative opportunity and to Digifest for hosting us today

Take our post event survey

- Scan the QR code →

Or

- Enter:

https://www.surveymonkey.co.uk/r/Post_HAIC_Event_Survey

Join our digital health and care network

- Scan the QR code →

Or

- Enter:

www.dhi-scotland.com/join-our-network

Visit our HAIC webpage

- Scan the QR code →

Or

- Enter:

www.dhi-scotland.com/innovation/innovation-clusters/healthy-ageing/

Join our private LinkedIn HAIC Group

- Scan the QR code →

Or

- Enter:

www.linkedin.com/groups/12496744/