

X Conferencia Anual de las Plataformas Tecnológicas de Investigación Biomédica: Medicamentos Innovadores, Nanomedicina Tecnología Sanitaria y Mercados Biotecnológicos

La innovación en el Sistema Nacional de Salud

Hotel Meliá Avenida de América, Madrid
C/Juan Ignacio Luca de Tena, 36

Madrid, 7 y 8 de Marzo de 2017

9:30 -11:30

Nuevas Redes de investigación para la cooperación público-privada

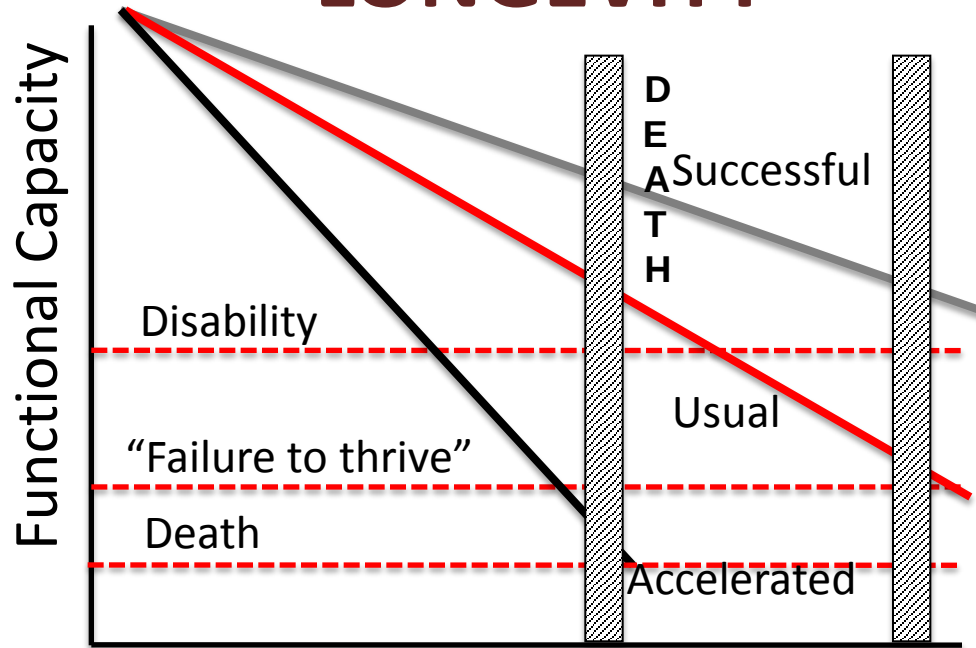
CIBER FRAGILIDAD Y ENVEJECIMIENTO SALUDABLE



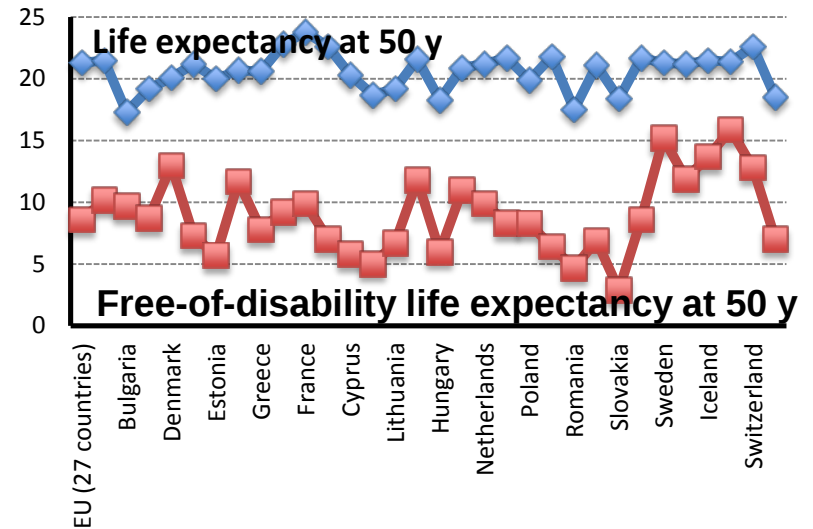
ciberfes

LEOCADIO RODRIGUEZ MAÑAS

LONGEVITY



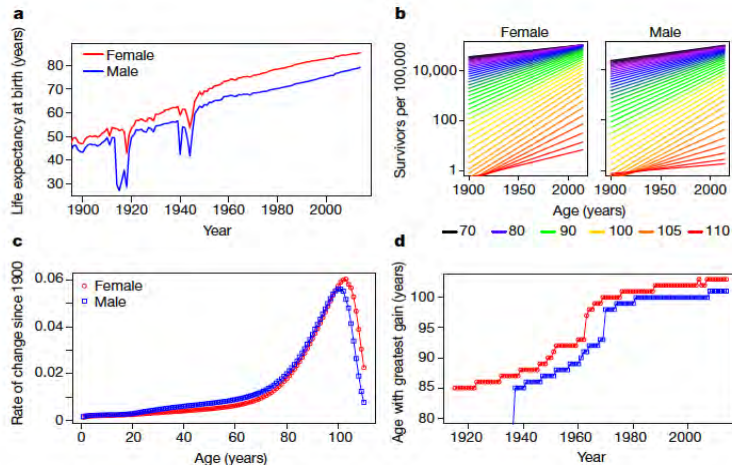
FUNCTION



Evidence for a limit to human lifespan

Xiao Dong^{1*}, Brandon Milholland^{1*} & Jan Vijg^{1,2}

Nature, October 2016



LONGEVITY (AMOUNT OF LIFE)

Prevention
Risk manag.
Empowerment

**CHRONIC
DISEASE**

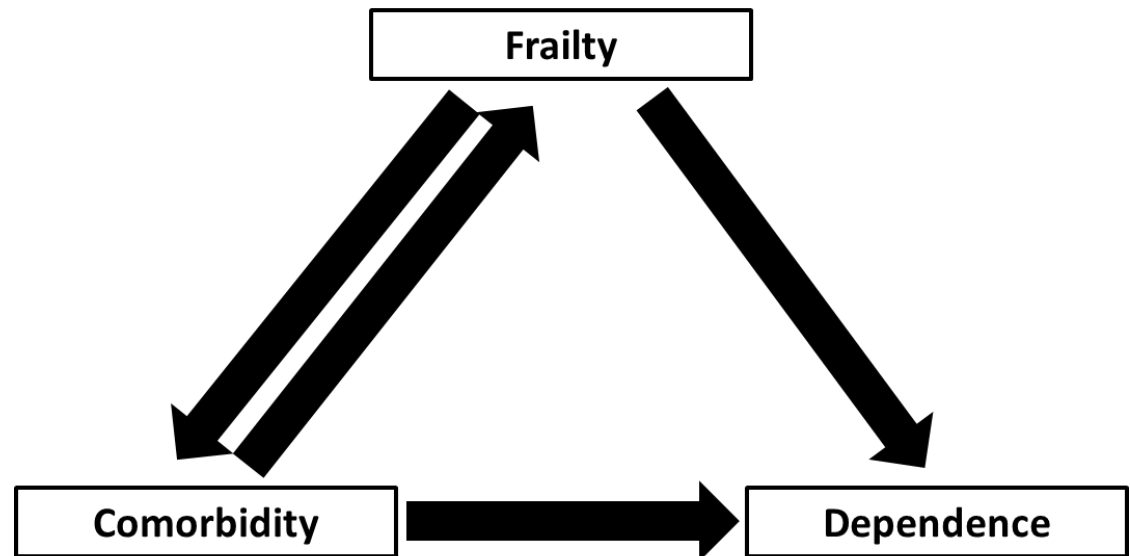
**HEALTH
SYSTEMS
+
SOCIAL
SYSTEMS**

Integrated
Coordinated.
Continued

QUALITY OF LIFE (FUNCTION)

Aging is not a disease: AGE ASSOCIATED CHANGES DISEASE

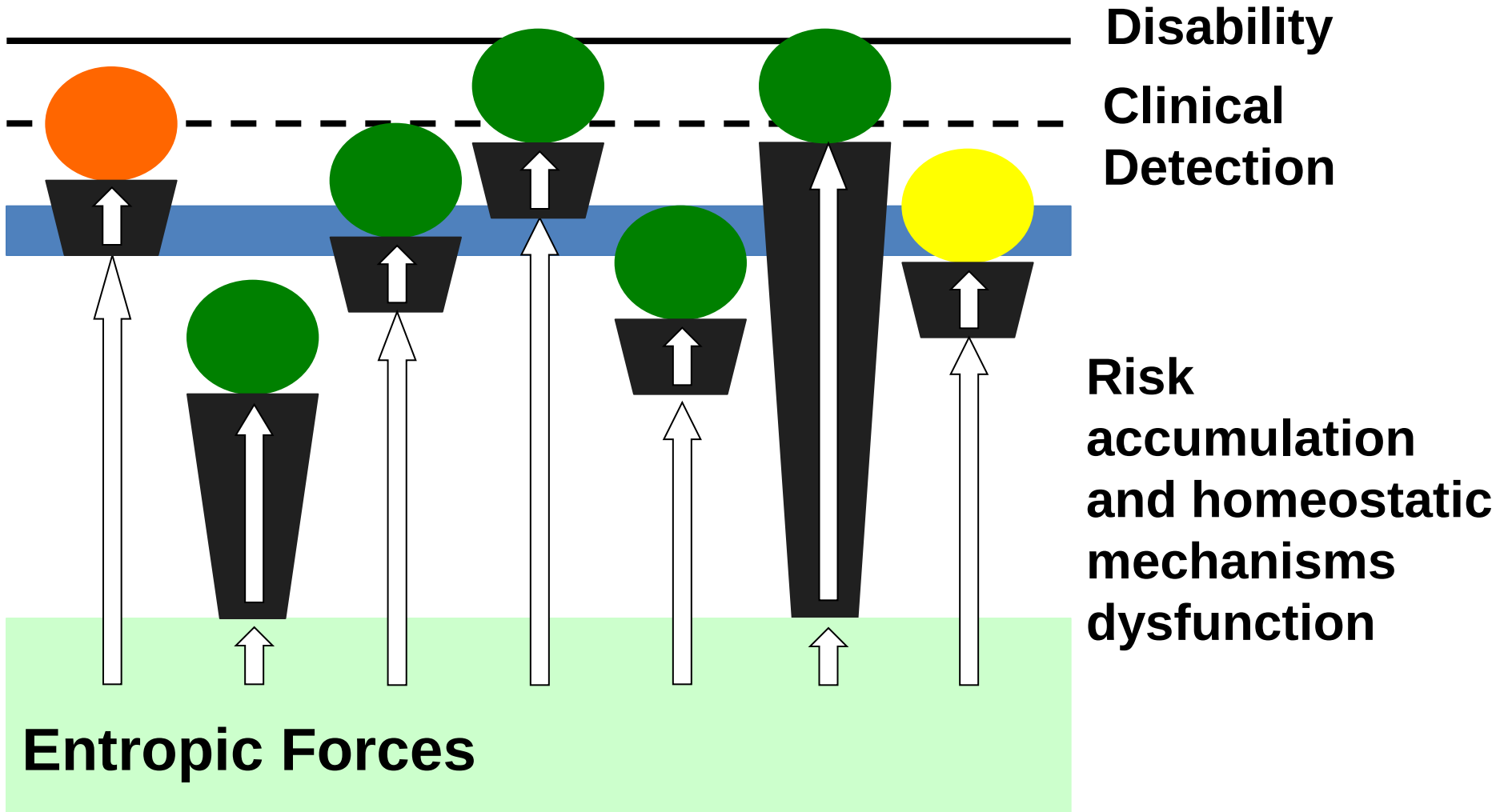
LEONARD HAYFLICK



Biological Aging Is No Longer an Unsolved Problem
Ann NY Acad Sci 2007; 1100: 1-13



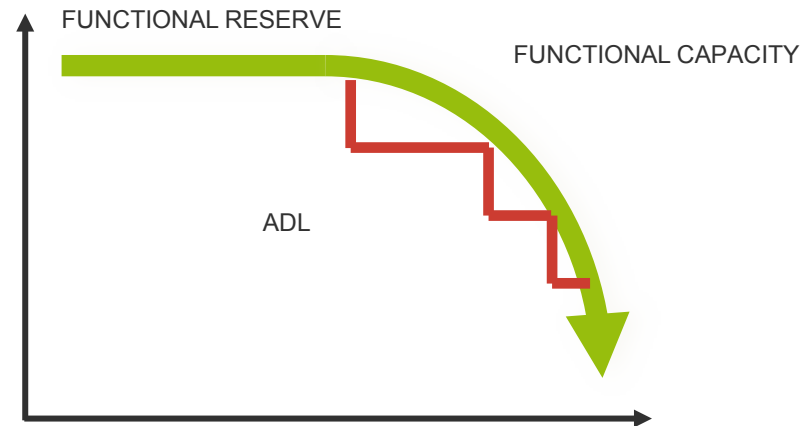
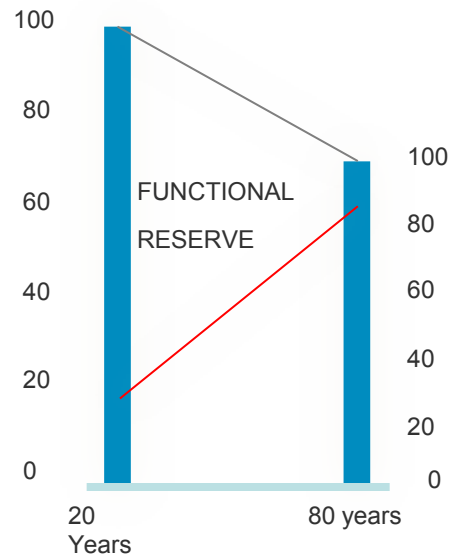
C. Age-related Frailty



Decreased biological reserves and reduced physiologic function underlies frailty

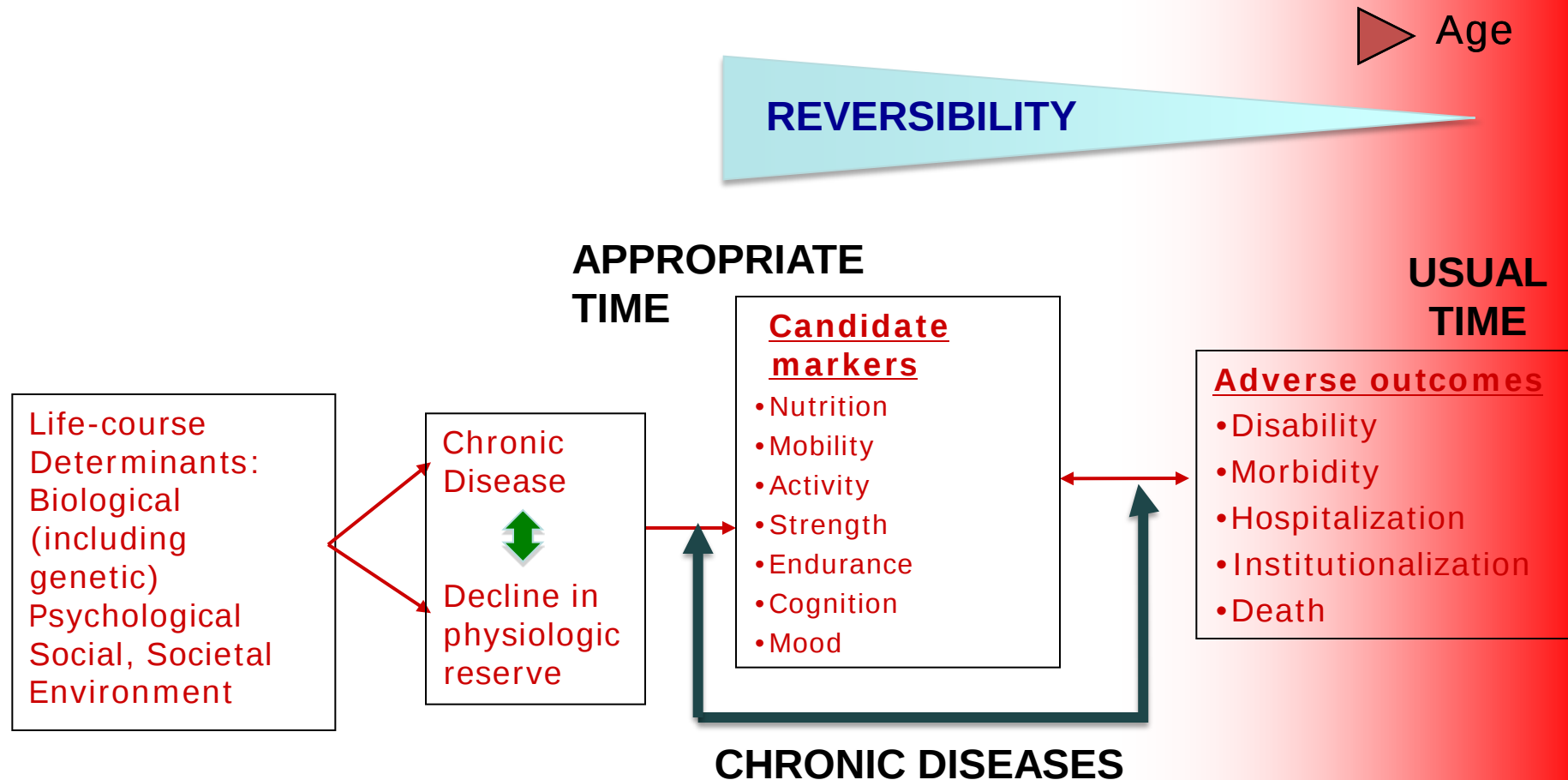
Aging process → Significant lost of Functional Reserve and Functional Capacity

% Maximal strength to sit to stand from a chair



- **Decrease of Functional reserve with age** → plausible association with decrease of functional capacity and performance of activities of daily living
- Because **functional level** is one of the best indicators of health status, Focus should be **on functionality** and not on the diagnosis of disease when facing older frail patients

Frailty: a Complex Syndrome of Increased Vulnerability



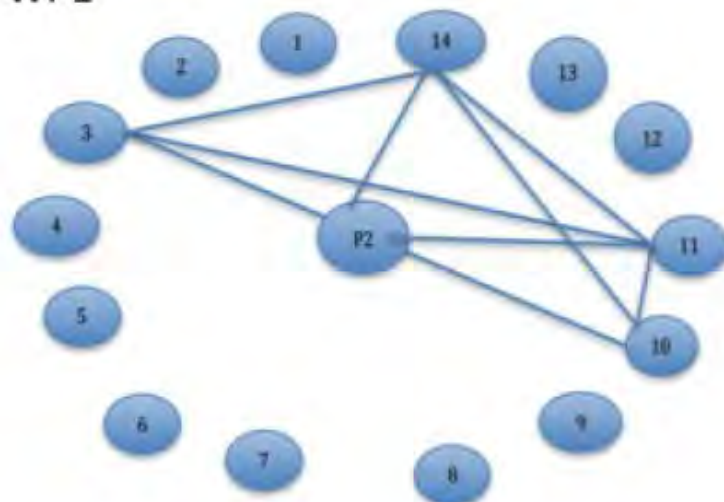
Frailty in the clinical scenario

The aim of health care has changed substantially—after centuries of trying to live longer, the time for living better has come. This change in focus has two main

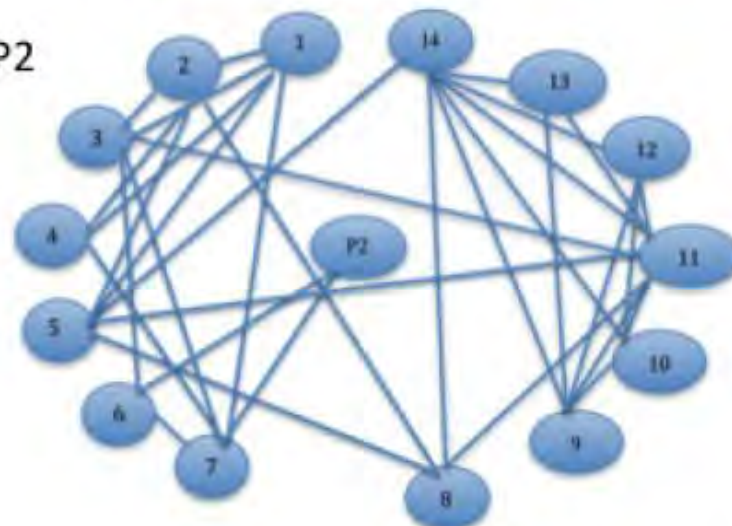
**Leocadio Rodriguez-Mañas, Linda P Fried*
Lancet, November 2014

Networking Schedule of the Work Packages

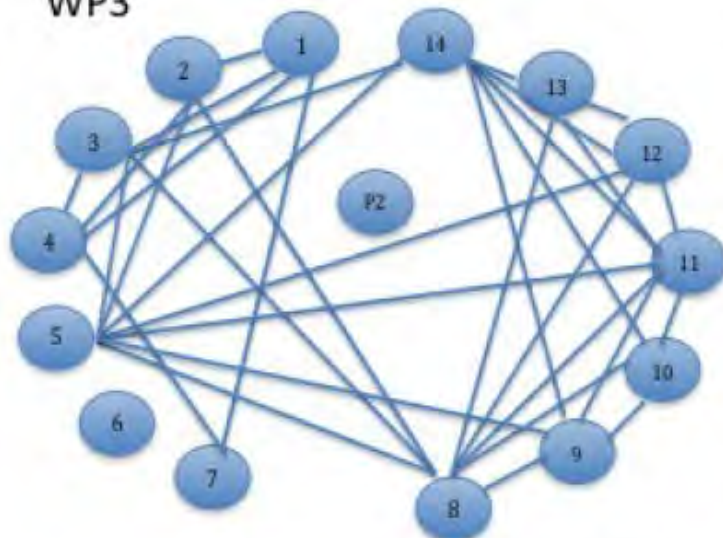
WP1



WP2



WP3



Cooperative Research Initiatives	Participant groups	Work packages
Prevalence and impact of frailty	3, 10, 11, 14	WP1
The falling person: Socio-economic, demographic and clinical determinants	6, 7	WP1, WP3
Clinical risk factors of pre-frailty and development of a predictive scale of frailty	2, 6, 7, 8, 11	WP1, WP3
Biological predictors of aging and frailty in different experimental and clinical conditions	1, 2, 3, 4, 5, 6, 7, 9, 11	WP1, WP2, WP3
Oxidative stress during aging, and their effect on bone-muscle	1, 2, 3, 4, 5, 6, 7, 8	WP2, WP3
Inflammatory response in aged and frail individuals and their impact on clinical groups	1, 2, 3, 4, 5, 6, 7	WP2, WP3
Genetic determinants of sarcopenia and osteoporosis	3, 5, 9, 10, 11, 12, 13, 14	WP2, WP3

Each number corresponds to the different participant groups in the Program 1 (see text) , P2= Program 2



CONTRIBUCION ANUAL RETICEF



RED TEMÁTICA DE INVESTIGACIÓN
COOPERATIVA EN ENVEJECIMIENTO
Y FRAGILIDAD (RETICEF)

www.reticef.es

Las actividades científicas a destacar han sido : puesta en marcha y seguimiento de 3 cohortes diferentes de ancianos (Estudio Toledo de Envejecimiento Saludable, Cohorte FRADEA de Albacete y Cohorte Peñagrande en Madrid) con el objetivo principal de estudiar la fragilidad, sus condicionantes, sus bases fisiopatológicas y sus marcadores pronósticos. El número de publicaciones derivadas de esta acción alcanzan las 30. Puesta en funcionamiento de Grupo Español de Centenarios, dirigido por el Prof. J Viña con el fin de estudiar los factores asociados a la longevidad extrema.

Coordinación de 6 proyectos europeos centrados en la fragilidad (FOD-CC; MID-FRAIL; FRAILOMIC, FRAILCLINIC, FRAILTOOLS, VIVIFY), tres de ellos dentro del FP7, dos de la DGSANTE y uno dentro de la Convocatoria ERASMUS+.

Participación en el desarrollo de programas europeos dentro del European Innovation Partnership-Active Healthy Ageing y del JPI More Years Better Lives y en las Knowledge Innovation Communities con el proyecto Innolife (KIC).

Informe de evaluación de las RETICs por la Comisión Técnica de Evaluación de Redes

3. Integrar, de forma efectiva, en el funcionamiento de la red al Consejo Asesor Externo, favoreciendo sus actuaciones conjuntas y de forma planificada.
4. Establecer un sistema de información accesible, como elemento fundamental de coordinación y seguimiento del programa.
5. Mejorar las alianzas cooperativas con otras estructuras de investigación a nivel nacional e internacional.
6. **No se debiera dejar de considerar la transformación de esta red en uno o varios programas coordinados dentro de otras estructuras, si lo anterior no pudiera ser aplicable.**

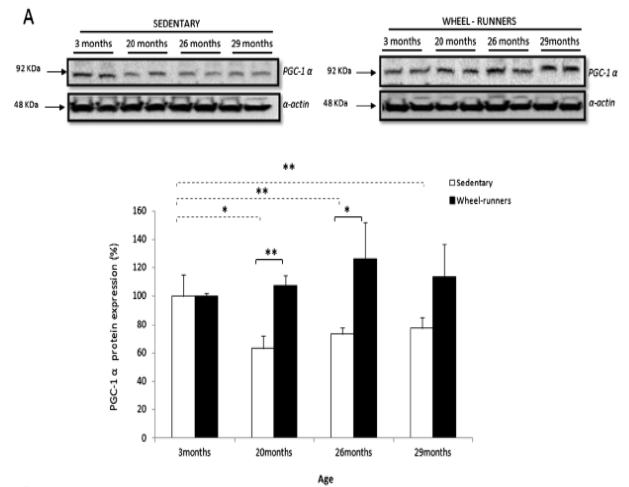
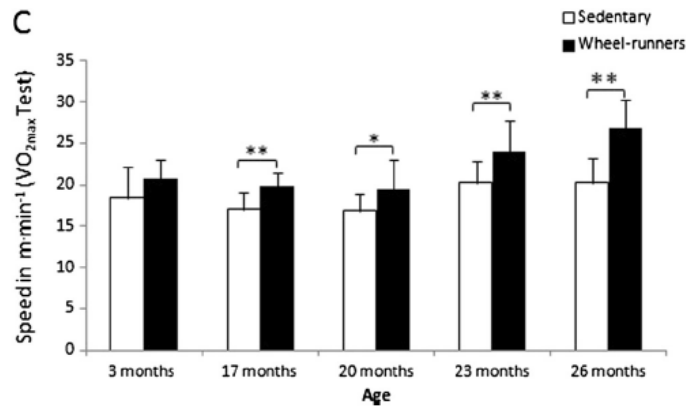
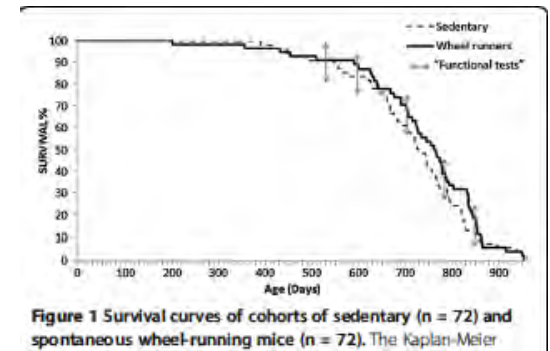
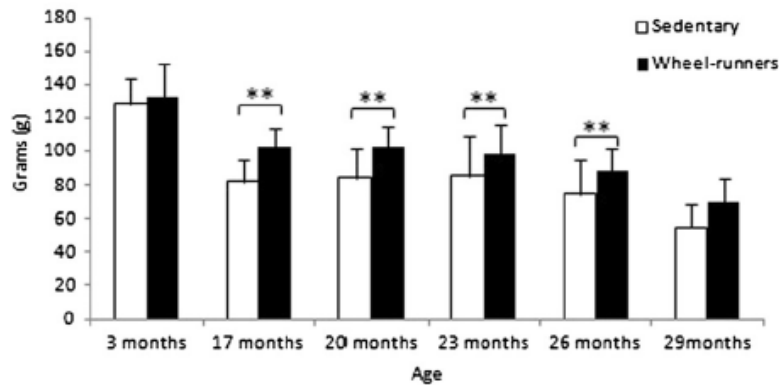
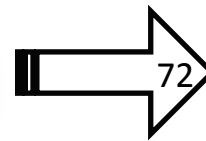
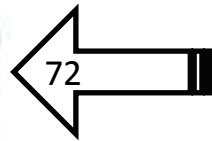
EXPEDIENTE	INVESTIGADOR PRINCIPAL	CENTRO SOLICITANTE	CENTRO REALIZACION
CB16/10/00408	ABIZANDA SOLER, PEDRO	SERVICIO DE SALUD DE CASTILLA-LA MANCHA	COMPLEJO HOSPITAL GENERAL DE ALBACETE
CB16/10/00238	ACUÑA CASTROVIEJO, DARIO	FUNDACION INV. BIOSANITARIA EN ANDALUCIA ORIENTAL ALEJANDRO OTERO (FIBAO)	ibs.GRANADA (INSTITUTO DE INVESTIGACION BIOSANITARIA DE GRANADA)
CB16/10/00269	ANDRES LACUEVA, MARIA CRISTINA	UNIVERSIDAD DE BARCELONA	FACULTAD DE FARMACIA (UCB)
CB16/10/00477	ARA ROYO, IGNACIO	UNIVERSIDAD DE CASTILLA-LA MANCHA	UNIVERSIDAD DE CASTILLA-LA MANCHA
CB16/10/00269	ANDRES LACUEVA, MARIA CRISTINA	UNIVERSIDAD DE BARCELONA	FACULTAD DE FARMACIA (UCB)
CB16/10/00477	ARA ROYO, IGNACIO	UNIVERSIDAD DE CASTILLA-LA MANCHA	UNIVERSIDAD DE CASTILLA-LA MANCHA
CB16/10/00282	BOLAÑOS HERNANDEZ, JUAN PEDRO	FUNDACION INSTITUTO DE ESTUDIOS DE CIENCIAS DE LA SALUD DE CASTILLA Y LEON	INSTITUTO DE INVESTIGACION BIOMEDICA DE SALAMANCA (IBSAL)
CB16/10/00245	DIEZ PEREZ, ADOLFO	CONSORCI MAR PARC DE SALUT DE BARCELONA (PSMAR)	INSTITUTO HOSPITAL DEL MAR DE INVESTIGACIONES MEDICAS (IMIM)
CB16/10/00289	ENRIQUEZ DOMINGUEZ, JOSE ANTONIO	FUNDACION CENTRO NAL DE INV. CARDIOVASCULARES CARLOS III	FUNDACION CENTRO NAL DE INV. CARDIOVASCULARES CARLOS III
CB16/10/00456	GARCIA GARCIA, FRANCISCO JOSE	FUNDACION DEL HOSPITAL NACIONAL DE PARAPLEJICOS	HOSPITAL VIRGEN DE LA SALUD
CB16/10/00383	GARCIA SEGURA, LUIS MIGUEL	CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS	INSTITUTO DE NEUROBIOLOGIA RAMON Y CAJAL
CB16/10/00315	IZQUIERDO REDIN, MIGUEL	UNIVERSIDAD PUBLICA DE NAVARRA	UNIVERSIDAD PUBLICA DE NAVARRA
CB16/10/00239	MADRID PEREZ, JUAN ANTONIO	UNIVERSIDAD DE MURCIA	UNIVERSIDAD DE MURCIA
CB16/10/00496	MATHEU FERNANDEZ, ANDER	ASOCIACION INSTITUTO BIODONOSTIA	INSTITUTO DE INVESTIGACION SANITARIA BIODONOSTIA
CB16/10/00417	MOLINUEVO GUIX, JOSE LUIS	FUNDACION BARCELONABETA BRAIN RESEARCH CENTER	FUNDACION BARCELONABETA BRAIN RESEARCH CENTER
CB16/10/00468	MORENO CASBAS, TERESA	INSTITUTO DE SALUD CARLOS III	INSTITUTO DE SALUD CARLOS III
CB16/10/00475	MUÑOZ TORRES, MANUEL	FUNDACION INV. BIOSANITARIA EN ANDALUCIA ORIENTAL ALEJANDRO OTERO (FIBAO)	ibs.GRANADA (INSTITUTO DE INVESTIGACION BIOSANITARIA DE GRANADA)
CB16/10/00270	PRIETO ALHAMBRA, DANIEL	IDIAP JORDI GOL	IDIAP JORDI GOL
CB16/10/00501	QUESADA GOMEZ, JOSE MANUEL	FUNDACION INVESTIGACION BIOMEDICA DE CORDOBA (FIBICO)	INSTITUTO MAIMONIDES DE INVESTIGACION BIOMEDICA DE CORDOBA (IMIBIC)
CB16/10/00464	RODRIGUEZ MAÑAS, LEOCADIO	FUNDACION INVESTIGACION BIOMEDICA HOSPITAL DE GETAFE	FUNDACION INVESTIGACION BIOMEDICA HOSPITAL DE GETAFE
CB16/10/00314	SERRA REXACH, JOSE ANTONIO	FUNDACION INVESTIGACION BIOMEDICA HOSPITAL GREGORIO MARAÑON	HOSPITAL GREGORIO MARAÑON
CB16/10/00435	VIÑA RIBES, JOSE	FUNDACION HOSPITAL CLINICO UNIVERSITARIO DE VALENCIA	INSTITUTO DE INVESTIGACION SANITARIA INCLIVA

Los objetivos principales del CIBER sobre Fragilidad y Envejecimiento Saludable son:

1. Evitar la discapacidad en las personas mayores, mediante el conocimiento de sus causas, mecanismos y de la efectividad de las intervenciones terapéuticas y preventivas, con especial atención a las etapas precoces de la discapacidad (fragilidad), sus factores de riesgos y sus consecuencias.
2. Proveer de evidencia experimental a la toma de decisiones sobre modelos preventivos y asistenciales

Para el logro de estos objetivos principales, se desarrollarán 3 líneas estratégicas,

- Mecanismos biológicos del envejecimiento saludable orientado al mantenimiento de la autonomía funcional y de los mecanismos que conducen a la fragilidad y la discapacidad.
- Trayectorias funcionales y factores moduladores. Estudios de cohortes. interacción enfermedad crónica-envejecimiento-deterioro funcional
- Intervenciones preventivas y terapéuticas de la fragilidad y el deterioro funcional. análisis de eficacia, eficiencia y efectividad.



ESTUDIOS LONGITUDINALES

RETICEF-Longitudinal studies on aging and frailty

Toledo Study for Healthy Aging

population-based study conducted on community-dwelling elderly aged 65 years and older

The Camargo Cohort Study

community-based study in postmenopausal women and men older than 50

CETIR Cohort Study

retrospective cohort of women aged 40-90yr. Patients were followed from their first bone densitometry to the first major osteoporotic fracture event or for 10yr whichever comes first

Diabetes 2 cohort study University of Granada

Spanish group of centenarians studies

Grupo español para el estudio de centenarios

Paget cohort Study

Patients older than 55 years

FRADEA Study

population-based cohort elderly older than 70 years

Vertebral fracture cohort study

Frailty women aged 59-70 years

The Peñagrande cohort Study

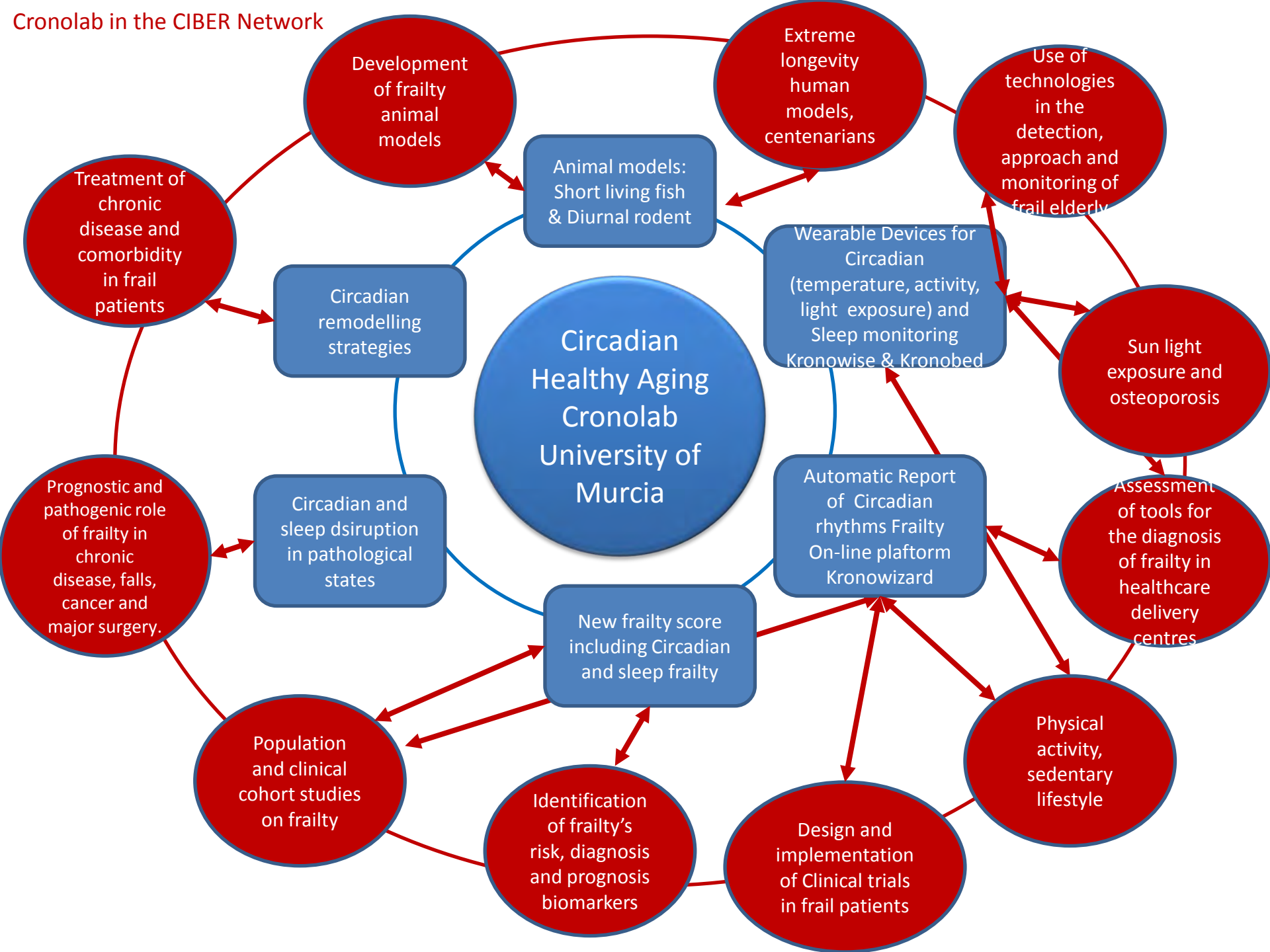
Sex and age stratified random sample of 1250 people aged ≥ 65 years living in Madrid

Our team

We are a multidisciplinary team focused on research on older people focused on frailty, functional decline and chronic conditions (e.g. diabetes, heart failure) through observational and interventional studies on diagnostic procedures, biomarkers, models of care and new therapeutic approaches.

- **12 Geriatricians**
- **2 Clinical Pharmacologists**
- 2 Biomedical engineers
- 2 Biologists
- 1 Mathematician and statistician
- 1 Epidemiologist
- 1 Nutritionist
- 1 Physiotherapist
- 1 Economist (health economics)
- 1 Neuropsychologist
- 1 Occupational Therapist
- **3 Research Nurses**
- 1 Lab technician

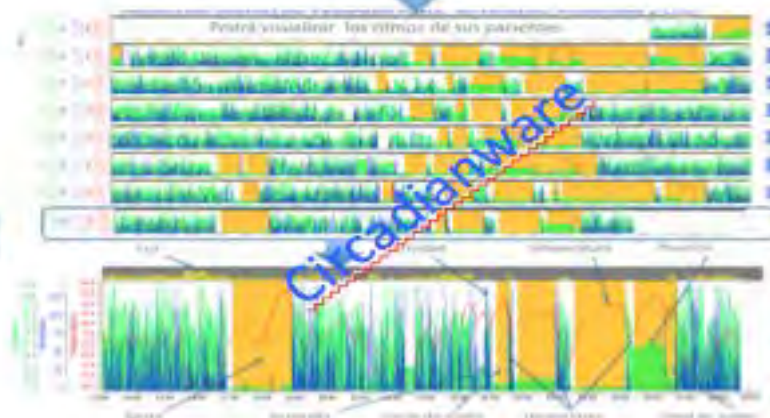




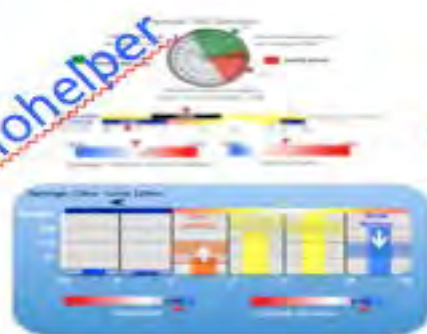
Chronobiological tools for circadian chronoenhancement



Kronowizard



Circadianware



Kronohelper



Kronolight





Envejecimiento y fragilidad. Un nicho para la innovación tecnológica

Prof. Leocadio Rodríguez Mañas
Sº de Geriatría
Hospital Universitario de Getafe

DG SANCO – PUBLIC HEALTH

http://ec.europa.eu/health/index_en.htm

Public Health Europe - European Commission - EU - Windows Internet Explorer

http://ec.europa.eu/health/index_en.htm

Public Health Europe - European Commission - EU

About this site | Contact | Legal notice | English (en)

European Commission > DG Health & Consumers > Public health

Latest updates

List of eurobarometers updated
Released 11 November 2011
Under: WCE drugs | Population groups | Health and structural funds | EU in the world | Data collection | Patient safety | Healthy environments | Social determinants and health inequalities | Climate change

2011 International Scientific Conference on EMF and Health, Brussels, 16-17 November 2011 - The Conference is broadcast live.
[Read the programme and watch the event online](#)

Proposal for a regulation of the European Parliament and the Council on establishing the 3rd multi-annual programme of EU action in the field of health for the period 2014-2020
Released 10 November 2011
Under: Health programme

Steering EU Public Health

- [Health strategy](#)
- [Health programme](#)
- [Legislation](#)
- [EU in the world](#)
- [Health in all policies](#)
- [Health and structural funds](#)

Ensuring health security

- [Preparedness and response](#)
- [Blood, tissues and organs](#)
- [Climate change](#)

Pharmaceuticals

- [Medicinal products for human use](#)
- [Medicinal products for veterinary use](#)
- [International activities](#)

Taking Action against Diseases

- [Communicable diseases](#)
- [Vaccination](#)
- [Major and chronic diseases](#)
- [Rare diseases](#)

Health in Society

- [Social determinants and health inequalities](#)
- [Ageing](#)
- [Population groups](#)
- [Interest groups](#)
- [Healthy environments](#)
- [Screening and genetics](#)

Medical devices

- [Innovative technologies](#)

El Programa Marco de la UE para
Investigación e Innovación

Parte esencial de la Estrategia
Europa 2020

2014-2020

Foco en retos sociales a los que se
enfrenta la sociedad UE, e.g. salud

77.028 M€

Partenariados:

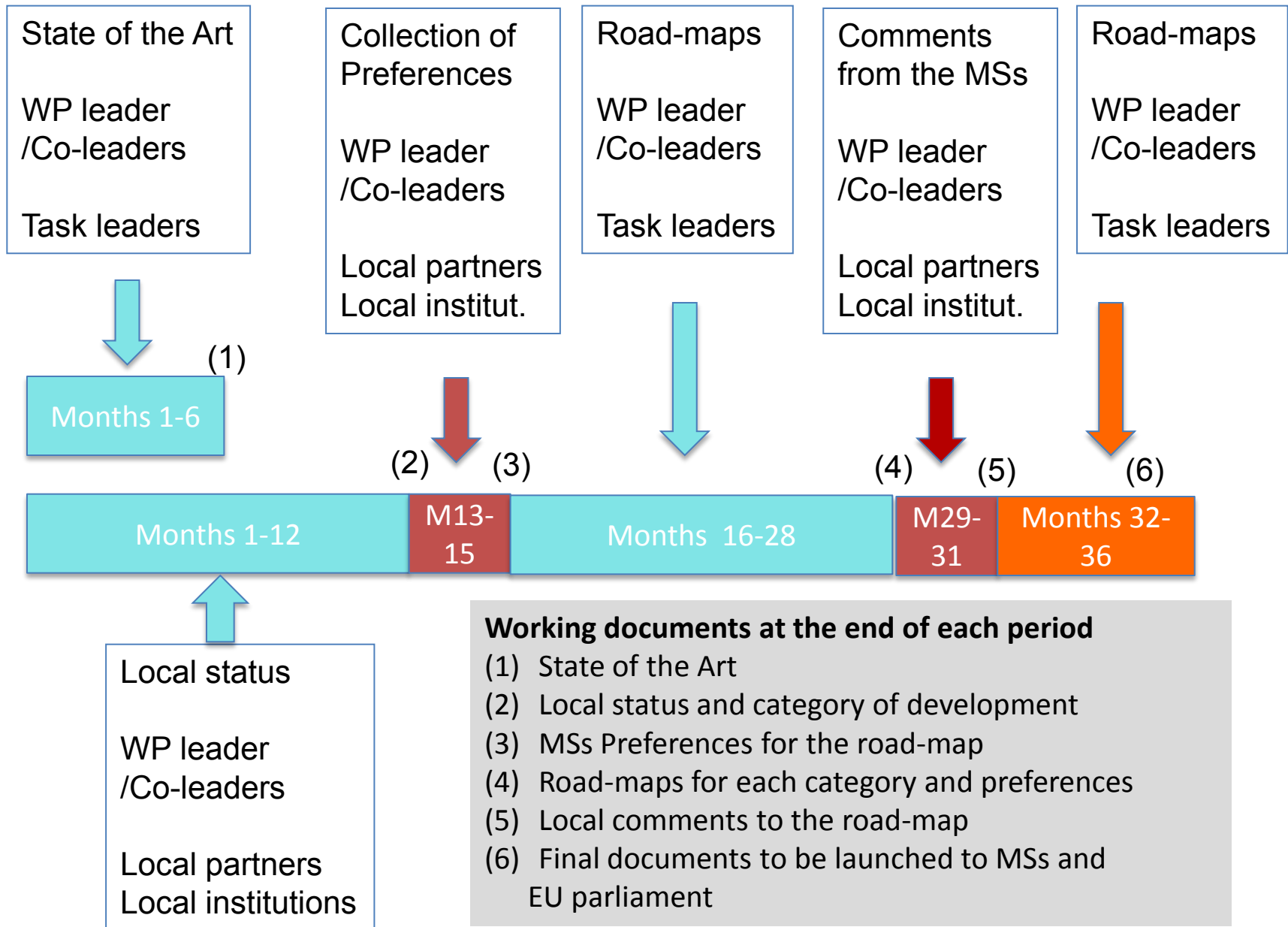
Simplificación

Público-Privado, Público-Público

Cooperación Internacional

The background of the slide features a blue gradient with a central graphic of a globe. The globe is positioned as if it's rising over a horizon, with a bright light source behind it creating a lens flare effect. The words "HORIZON 2020" are written in large, white, sans-serif capital letters across the middle of the image, with the globe acting as the letter 'O' in "HORIZON".

HORIZON 2020



PARTNERS

- UAM
- UPM
- UPNA
- UV
- KAROLINSKA INSTITUTE
- KINGS COLLEGE (LONDON)
- BEDS/HART UNIVERSITY
- U. TOULOUSE
- U. BORDEAUX
- UCSC (ROMA)
- U. BRUSSELS
- U. NAPOLES-2
- U. S CARLOS (PRAGA)
- JAGELLONIAN U. (CRACOVIA)
- BETHESDA HOSP. (STTUTGART)
- HOSP. S. RAFFAELLE (ROMA)
- WHO
- CARDIFF UNIVERSITY
- CARDIFF METROPOLITAN U.
- GERMAN INST. NUTRITION
- FRIEDRICH SCHILLER U (JENA)
- AUSTRIAN ACADEMY OF SCI.
- GHENT UNIVERSITY
- INRCA (ITALY)
- LIFELENGTH
- GENOMIC SYSTEMS
- INGEN
- IDETRA
- CLASE10
- DIFRAIL (UK)
- YOUHEALTH
- EVERCYTE
- MOSAIQUES
- SIEMENS
- ATOS
- CREATE-NET
- AUSTRIAN INSTIT. OF TECHNOLOGY
- INTERDIGITAL



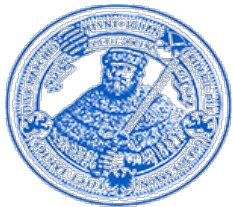
Thus, the **MAIN objective** of FRAILOMIC is to develop clinical instruments (composed by clinical BMs, -omics based laboratory BMs and classical laboratory BMs):

- To predict the risk of frailty
- To improve the diagnostic accuracy of frailty in day to day practice
- To assess the prognosis of frailty in terms of disability and other adverse outcomes

In addition, the project has also three **SECONDARY objectives**:

- 1) To assess the interactions between -omic based BMs and nutrition and physical exercise (useful to know the potential response to treatments) on the natural history of frailty.
- 2) To test whether the above stated instruments are also useful for special populations: people with diabetes, obesity and people with cardiovascular disease
- 3) To test the differential validity of Fried's criteria as compared with those described in the THSA and Three-City-Bordeaux studies.

Partners of FRAIOMIC



seit 1558



SanRaffaele.it



SERVIZIO SANITARIO REGIONALE
EMILIA-ROMAGNA
Azienda Ospedaliero-Universitaria di Parma



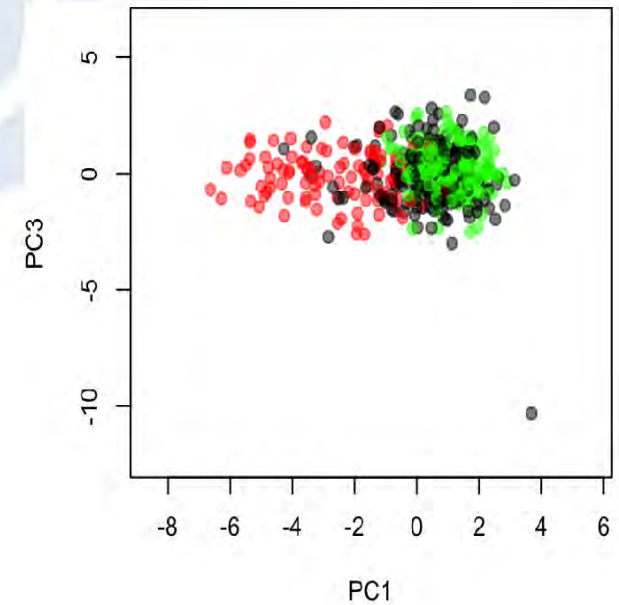
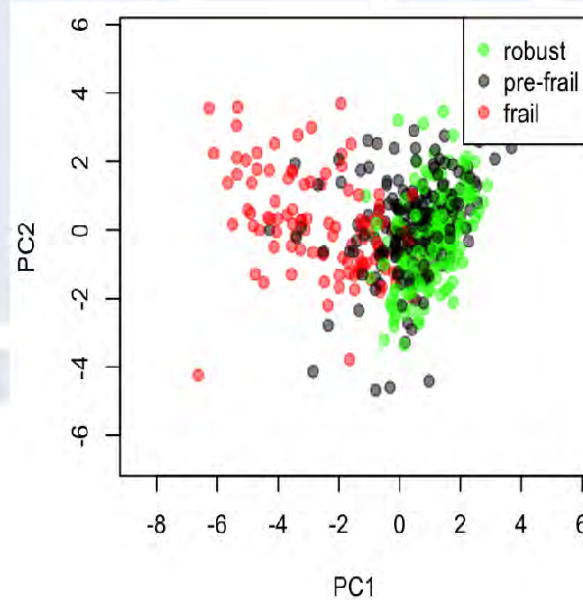
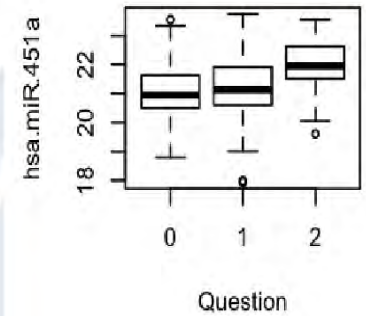
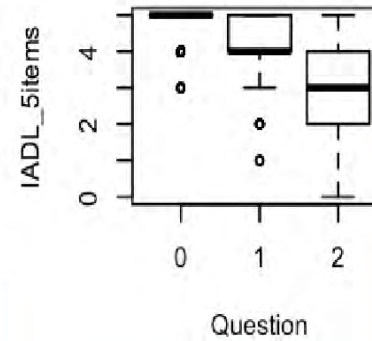
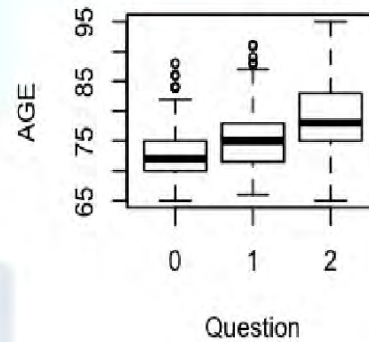
VNIVERSITAT
ID VALÈNCIA



ETS

Q1_FINAL

AGE
 CONGESTIVE_HEART_FAILURE
 DEPRESSION
 GENDER
 hsa.miR.125b.5p
 hsa.miR.126.3p
 hsa.miR.155.5p
 hsa.miR.451a
 IADL_5items
 KATZ
 KATZ_BINARY
 Protei_carbonyls
 Retinol
 SDP
 VCAM.1
 WAIST_CIRC
 WINE
 X25_hydroxyvitamin_D3
 X56884



Use of Minimal model and Toledo cohort information variables in diagnosis (Q1) by PCA a

“Developing innovative therapeutic interventions against physical frailty and sarcopenia (ITI-PF&S) as a prototype geriatric indication”



GlaxoSmithKline



Innovative Medicines Initiative



**IMI Call n.9
(call for interest)
published on
July 9th, 2013**

Multi-component intervention (MCI)

Physical activity intervention

Structured exercise and physical activity (LIFE study protocol), mainly aerobic

Nutritional assessment and dietary intervention

Personalised dietary recommendations

Health technology intervention

Remote monitoring of daily physical activity, walk speed, reinforcement of intervention adherence

The SPRINTT randomised clinical trial

15 clinical sites (+ 1)
9 European countries



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www.unircat.it



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Novartis Pharma AG
www.novartis.com



Jagiellonian University
www.um.jagiellonia.pl



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Sanofi-Aventis Research and
Development
<http://www.sanofi.com/index.aspx>



Roessingh
Roessingh Research and Development BV
www.rnd.nl



EU-OPEN S.R.L.
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GlaxoSmithKline
GlaxoSmithKline Research and
Development LTD
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Eli Lilly and Company Ltd
www.lilly.com



Hôpitaux de Toulouse
Centre Hospitalier Universitaire de Toulouse
www.chu-toulouse.fr



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Helsingin yliopisto (University of Helsinki)
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Universitätsmedizin Göttingen, Georg-August-Universität
Stiftung Öffentlichen Rechts
www.med.uni-goettingen.de

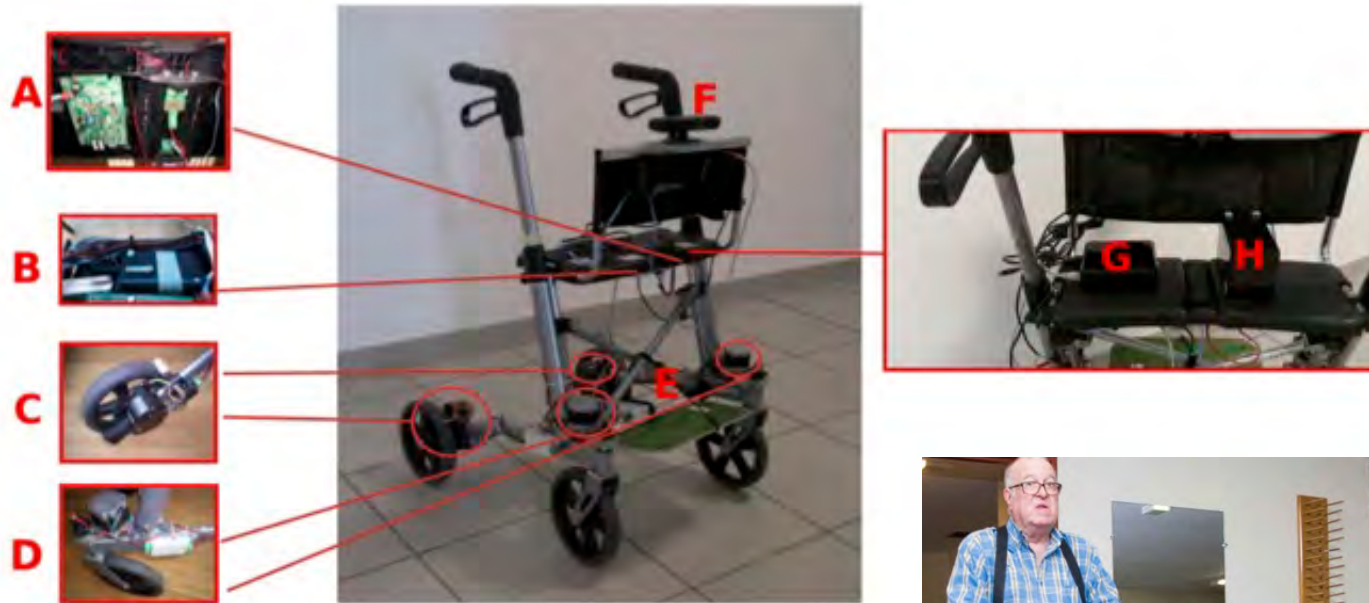


Sprintt
CLINICAL TRIAL

ACANTO Consortium



ACANTO is a continuation of a recently finished project: DALI: Devices for Assisted Living



**WP1. ACANTO
Clinical Validation**



Características del Paciente

PACIENTE “CLASICO” (siglo XX)

Una enfermedad

Sin impacto sobre la función

Sin secuelas funcionales

PACIENTE MODERNO (siglo XXI)

Varias enfermedades crónicas,
con reagudizaciones frecuentes

Con impacto sobre la función

Con secuelas funcionales

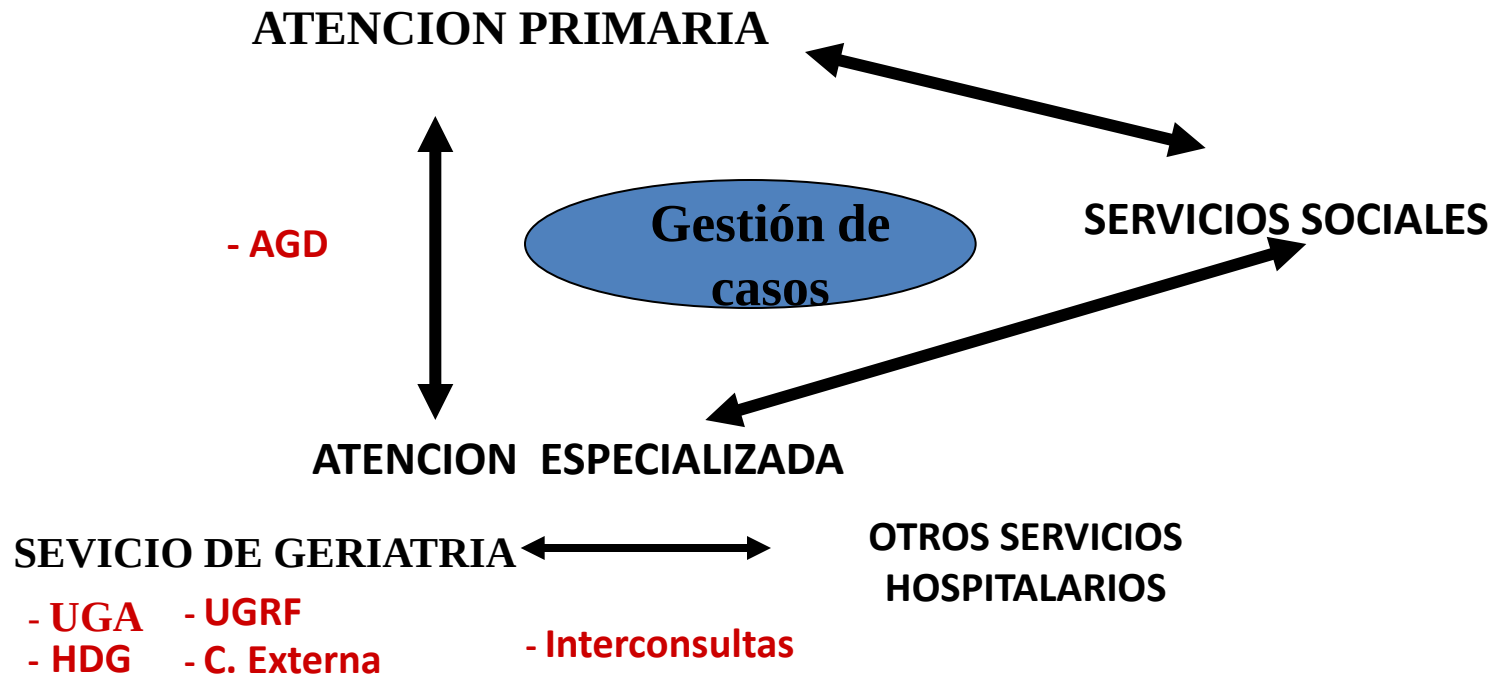
Características de los Sistemas de Salud

**ENFOCADOS EN
LA ENFERMEDAD**

**ENFOCADOS EN
LA FUNCION**

Rodríguez-Mañas; 2001

ESQUEMA GENERAL DE ASISTENCIA GERIATRICA SECTORIZADA Y COORDINADA



AGD: asistencia geriátrica domiciliaria; UGA: Unidad Geriátrica de Agudos; UGRF: Unidad Geriátrica de Recuperación Funcional; HDG: Hospital de Día Geriátrico;

• EIT Health Spanish co-location center

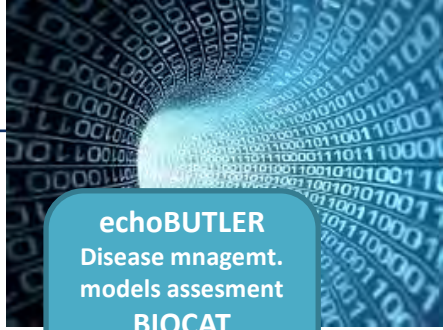
The Spanish node is formed by three regions (Catalunya, Madrid and Valencia) involving strong partners in the three areas of the innovation triangle: research, education and business



Industry



PIPELINE OF PROJECTS LISTED (WORK IN PROGRESS 2015)



echoBUTLER
Disease mnagemt.
models assesment
BIOCAT

TRL3-9

AD CARE
caregivers support
CAIXA FUND
TRL (ND)

Magic-AD
UPM
TRL (ND)

**AD-
DIAGNOSTIC**
UPM
TR5-8

SMARTCARE
Integrated care
platforms
UPV
TR7

BeyondSILOS
ICT integrated care
UPV
TRL7

BREATHE
Manage stress and
depressions
UPV
TRL7

**FRAILTY
SERMAS**
TR6-8

ACTIVATE
managing
dependant people
at home
UPV
TR6

FRAILTY
(ALTARI-
HomeCare)
GMV
HOME monitoring
TRL8

ReAAL
Open platform for
independan living
UPV
TRL8

**FRAILTY
UPM**
TR6-8

**FRAILTY (MUSCLE
LOSS)
ABBOT**
Nutrition
TR9

VISUALAID
Enhanced reality for
visually impaired
UPM
TRL6

HMD_LOVI
aids for low
vission patients
UPM
TRL6

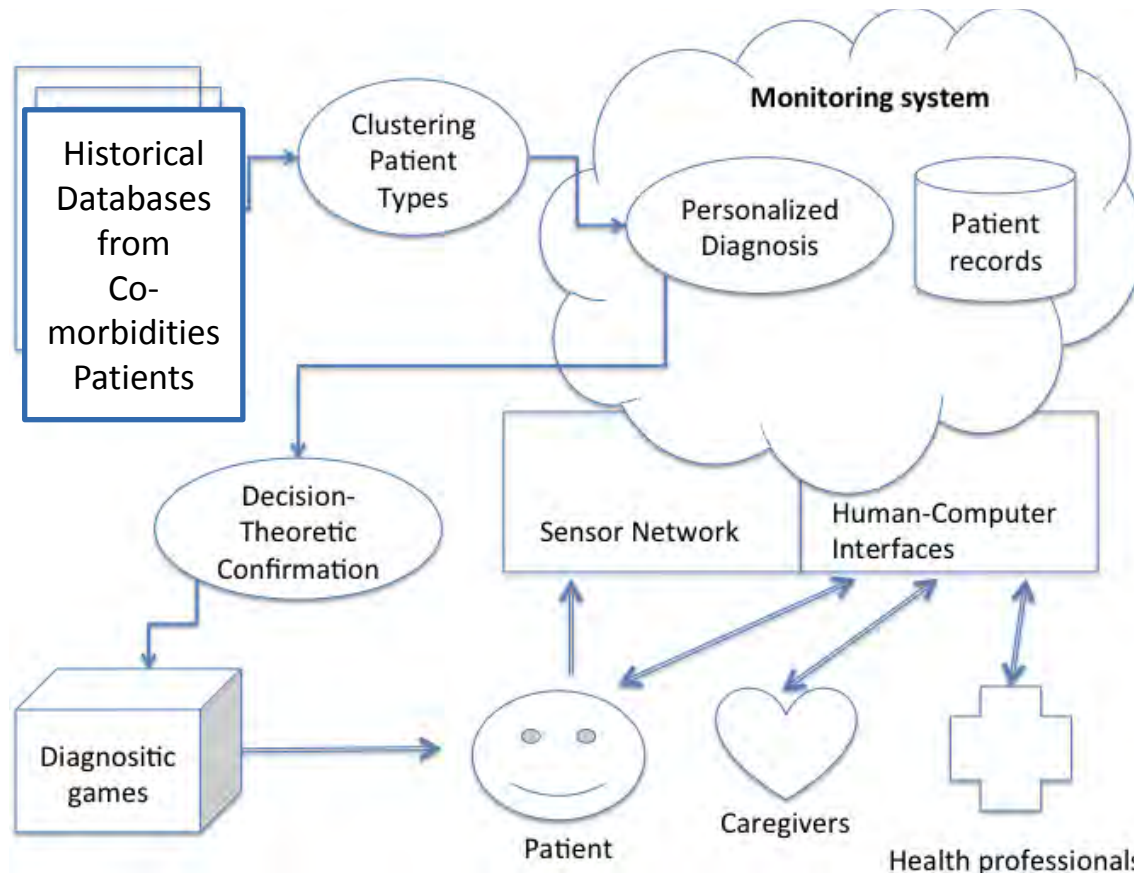
MemSleep
Enhancing ageing
memeory loss
UPM
TRL6

FRAILTY (PREHEE)
prescriptive health for
the elderly
GMV
TRL8

**FRAILTY
ATOS**
TR9

MATURITY

INNOVACIÓN: **FUNCTION vs DISEASE**



Now-a-days there are not in the market applications to attend the specific needs of elderly people with comorbidities in risk of developing dependency

EN CONCLUSION

**LO SE... DEBERÍA
PERDER PESO,
PERO YO ODO
PERDER**



¿PREGUNTAS?

