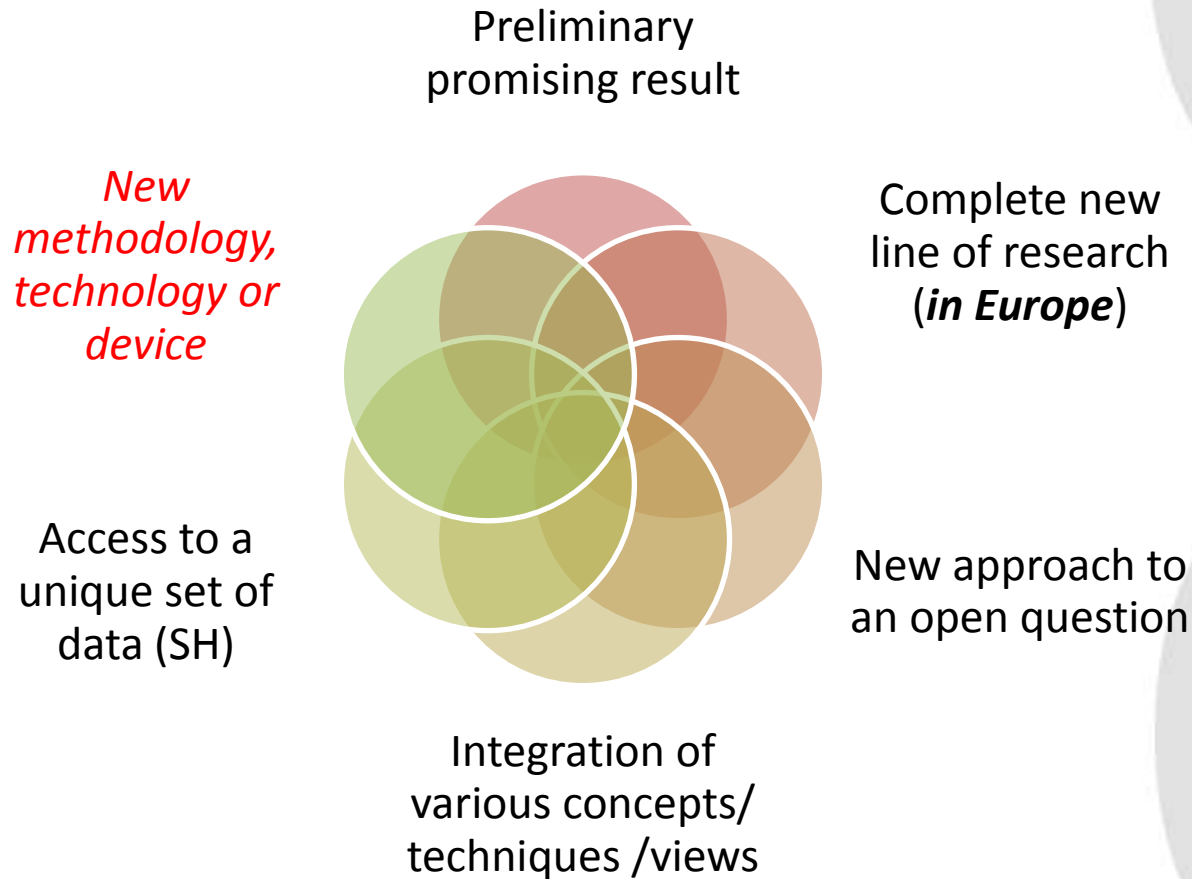


ERC EXAMPLES

What type of research the ERC funds?

Summary



PROPOSAL 1 (PE)

- New technique developed by the PI
- Proposal: to apply this new technique to a unique set of data in order to answer open questions relevant to a particular field and, eventually, to the whole domain.

The technique itself worths to be tested.

PROPOSAL 2 (PE)

- New technology to cope with a real nowadays (and near future) problem

*Novel approach for a
groundbreaking paradigm shift*



GOBIERNO
DE ESPAÑA

MINISTERIO
DE ECONOMÍA
Y COMPETITIVIDAD

FECYT



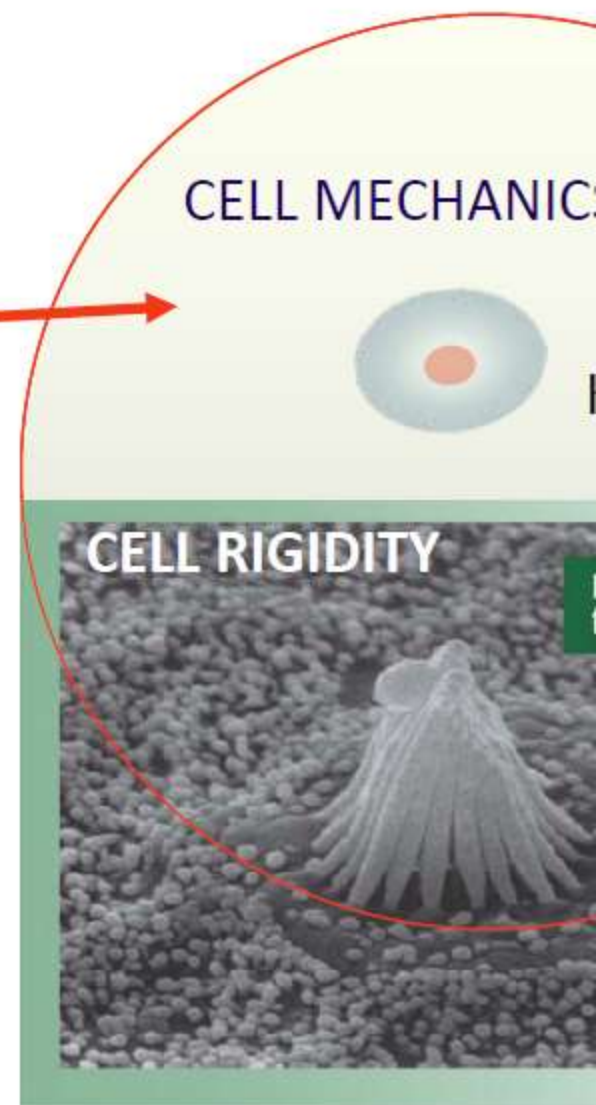
FUNDACIÓN ESPAÑOLA
PARA LA CIENCIA
Y LA TECNOLOGÍA

oficina
europea

Cell: basic functional unit of life

Cell / cell communication
Cell differentiation
Cell division / migration (metastasis)
Mechanosensation (hearing, pain,..)

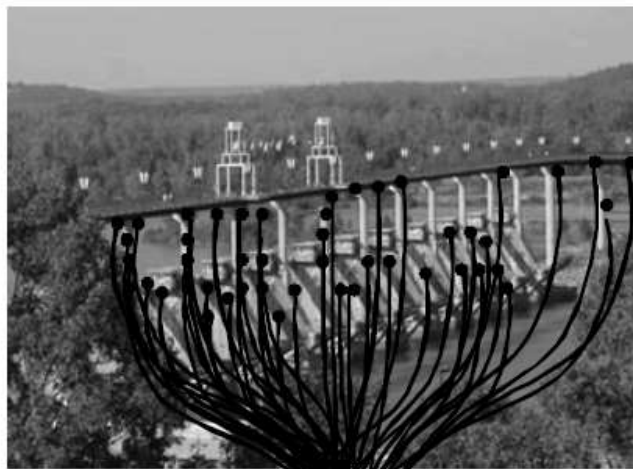
It seems that **disease** is connected to **mechanical properties** of biological systems: Cancer, Malaria, Sickle-cell disease, Taxol side-effects,...



NEW TOOLS ARE NEEDED TO STUDY MECHANICS

Miguel González Herráez (PE7)

U-FINE: overview



**N sensors, N wires,
N calibrations**



Proposal LS2: PRIMATESVS

Structural variation and copy-number variant regions (CNVs) (including segmental duplications) are usually underrepresented in genome analyses but are becoming a prominent feature in understanding the organization of genomes as well as many diseases. Large-scale comparative sequencing projects promised a golden era in the study of human evolution, however, many genome regions, especially these complicated regions, are clearly not solved. Despite international efforts to characterize thousand of human genomes to understand the extent of structural variants in the human species, **primates (our closest relatives) have somehow been forgotten**. Yet, they are the ideal set of species to study the evolution of these features from both mechanistic and adaptive points of view. Most genome projects include only one individual as a reference but in order to understand the impact of structural variants in the evolution of every species we need to re-sequence multiple individuals of each species. We can only understand the origins of genomic variants and phenotypical differences among species if we can model variation within species and compare it to a proper perspective with the differences among species. **The object of this proposal is to discover the extent of genome structural polymorphism within the great ape species by generating next-generation sequencing datasets at high coverage from multiple individuals of diverse species and subspecies, characterizing structural variants and validating them experimentally.** The results of these analyses will assess the rate of genome variation in primate evolution, characterize regional deletions and copy-number expansions as well as determine the patterns of selection acting upon them and whether the diversity of these segments is consistent with other forms of genetic variation among humans and great apes. In so doing, a fundamental insight will be provided into evolutionary variation of these regions among **primates** and into the mechanisms of disease-causing rearrangements with multiple repercussions in the understanding of evolution and human disease.

PROPOSAL 3: LS

- PRELIMINARY STUDIES of the PI HAVE DEMONSTRATED A HUGE POTENTIAL IN X DISEASE TREATMENT
- PROPOSAL: Pre-clinical validation of such drug.

*Very promising result that
needs further research*



GOBIERNO
DE ESPAÑA

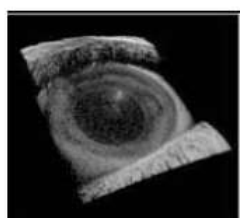
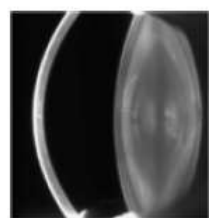
MINISTERIO
DE SANIDAD Y CONSUMO

PROPOSAL 4: LS

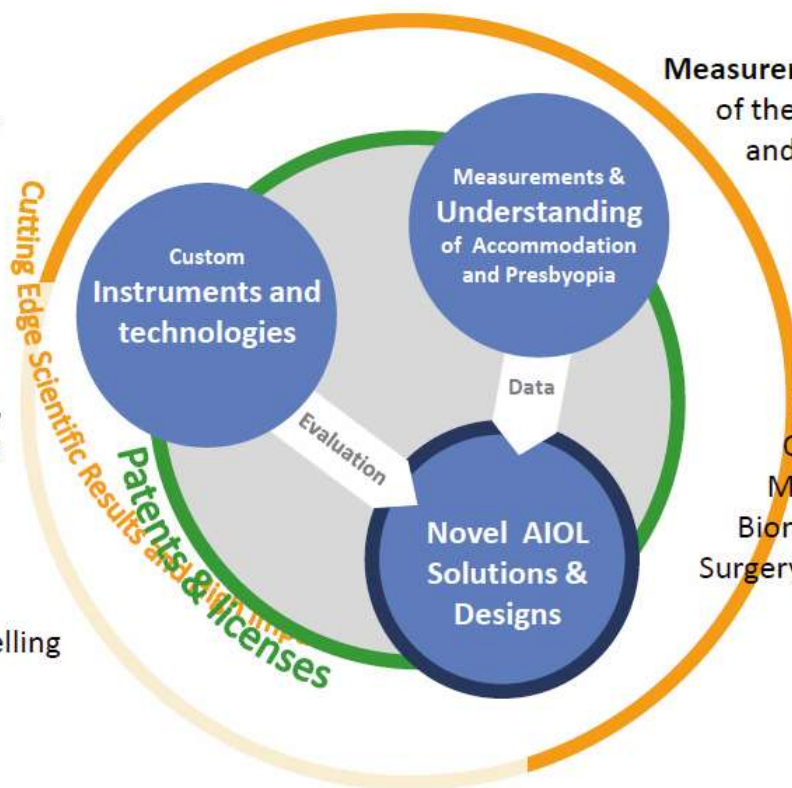
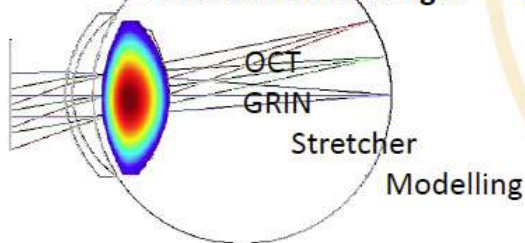
- Prevention, detection, and (future) therapy of a particular disease through metabolism-cell studies
- Use of a validated animal model

Very ambitious research programme that bridges in vitro and in vivo studies with patient data. Clear and significant potential to impact both basic research and clinical practice

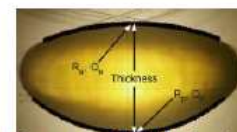
Susana Marcos (LS7)



Technology, instruments,
Simulation and design:



Measurements and experiments
of the crystalline lens
and intraocular lenses



Conceptual design
of accommodative
intraocular lenses:

Optics,
Materials
Biomechanics
Surgery



PROPOSAL 5 (SH)

- New (sustented) hypothesis that changes the actual paradigm of a period of History
- Proposal: to analyse, through a combination of cutting-edge methodologies, a new set of data available at different sites (not yet analysed)

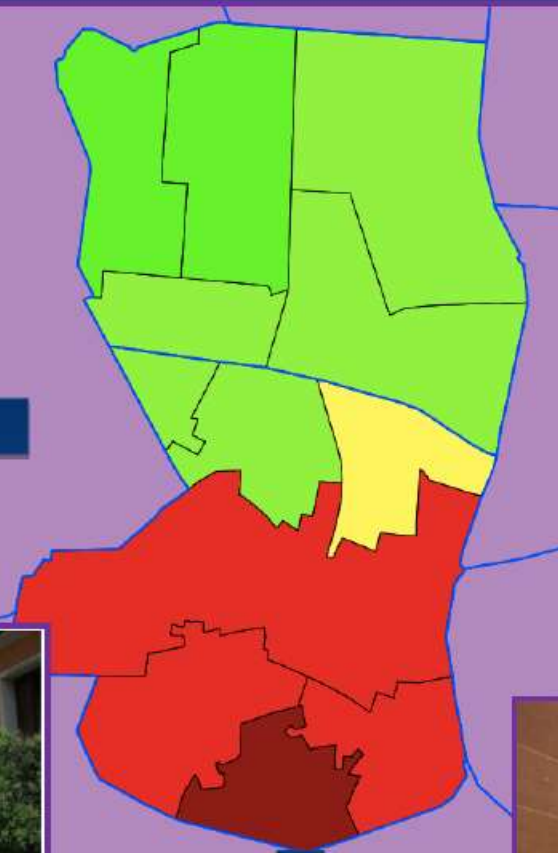
Rather new line of research, new approach, and (partially) novel methodologies

Does your neighborhood affect your health?

**Large Social
Cardiovascular Health
Disparities Between
Neighborhoods**

**Hypertension
Prevalence in 12
Neighborhoods
in Madrid**

**How can we
prevent CVD?**



ESPERANZA ALFONSO , SH5 & SH6, CSIC

Project: Interconnected research inquiries on the intellectual production of Late Medieval Sephardic Jews with the Hebrew Bible as a shared common element

Objectives:

- Production of bibles as cultural artifacts
- Biblical exegesis
- Relationship between bible and literature
- The Bible and community identity
- Bible and ethics
- Bible and the visual arts

What makes your proposal unique?

