

A scenic view of a park with a fountain, trees, and modern buildings. The fountain is in the foreground, with a rainbow visible in the mist. The background features a large, curved glass building and other structures. The sky is clear and blue.

# ERC in Horizon Europe

**Jean-Pierre BOURGUIGNON**

*ERC President*



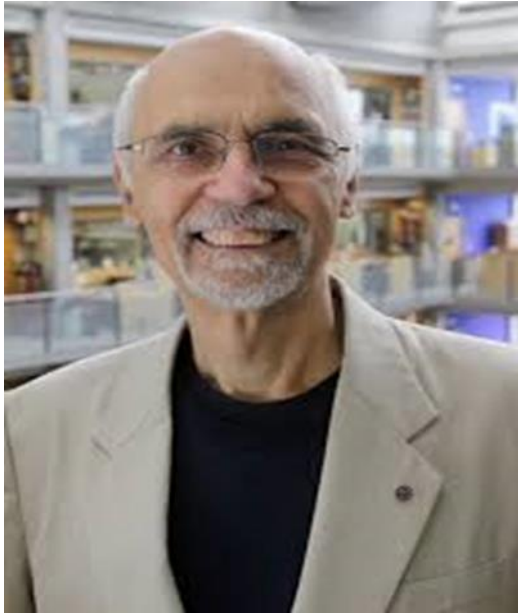
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# Frontier Research

# Europe Needs Excellent Research



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*"What is the comparative advantage of EU in the future? An increasingly old population, our limited natural resources? Investing in Research, which is an integral part of the European cultural tradition, is no longer a choice today, it is a one-way street for the EU. And the only way to make sure that investment pays back is excellence".*

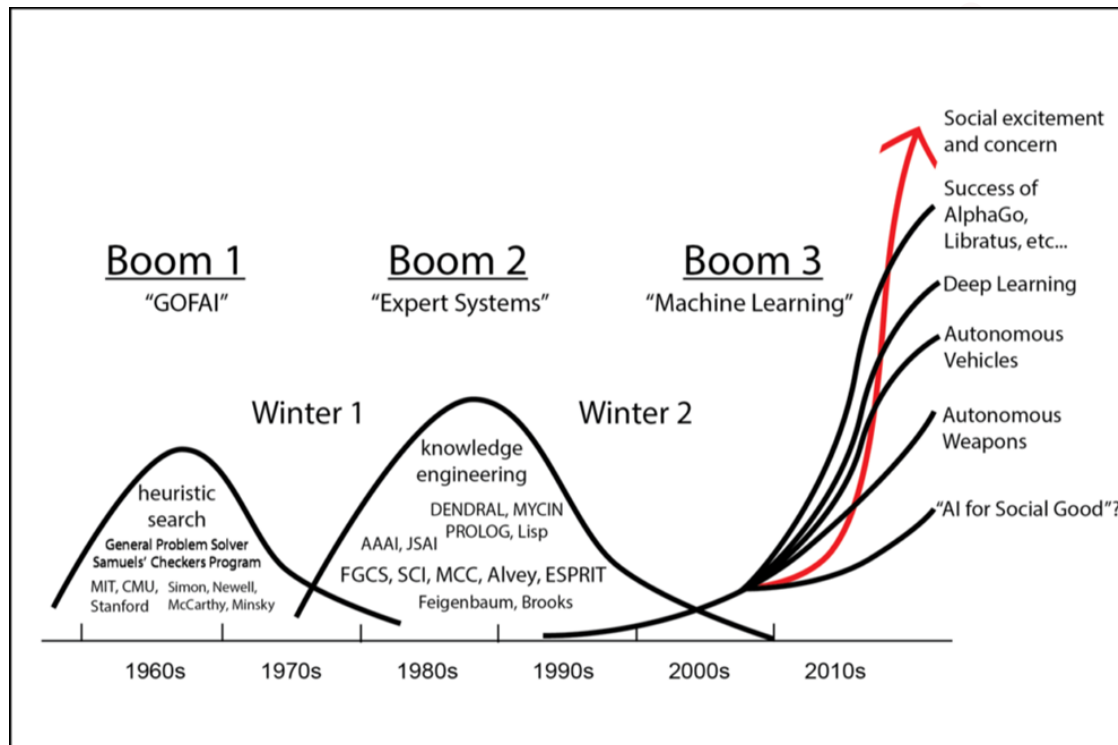
**Fotis KAFATOS, First ERC President.**  
**Speech at the ERC launch event in 2007 in Berlin**  
**in presence of Chancellor Angela MERKEL**

# Frontier Research and Artificial Intelligence



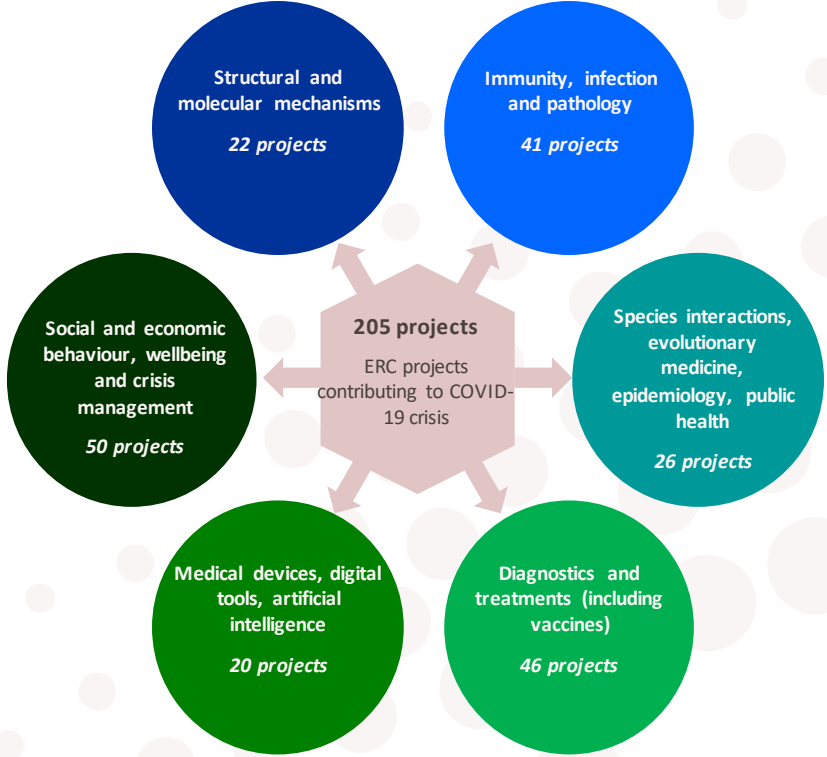
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Frontier researchers kept working on different approaches to AI for decades even when government and corporate funding dried up (twice!)



# ERC and Research on COVID-19

- About 200 ERC projects generate knowledge and technology that contribute to the response to the COVID-19 crisis
- Those projects were initiated before the crisis, showing the importance of long term research coming from bottom-up frontier ideas
- Highly interdisciplinary portfolio (LS, PE and SH)



# ERC and Research on COVID-19 Vaccines

## Two researchers developing COVID vaccines received ERC grants related to vaccines

- **Uğur ŞAHİN**, working on a new type of vaccines, an mRNA-based vaccine at BioNTech (with Pfizer as industrial partner)
  - => His ERC advanced grant, project 'SUMMIT' dedicated to a cancer mRNA-based mutanome vaccine (at the University Medical Centre of the Johannes Gutenberg University Mainz)
- **Adrian HILL**, working on a COVID-19 adeno-vector based vaccine at the University of Oxford (working with AstraZeneca as industrial partner)
  - => He received an ERC advanced grant, for the project 'IMMUNOGENE' about understanding the impact of human genetic diversity on responses to a range of vaccine antigens (including pertussis, diphtheria and hepatitis B)



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# ERC Rationale and Results

# ERC Rationale



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- *Reinforce excellence, especially in new, fast-growing research areas*
- *Stay ahead in a world of growing scientific and technological competition;*
- *Link science to technological innovation;*
- *Compete for talent;*
- *Encourage greater investment.*

## Frontier Research: The European Challenge High-Level Expert Group Report February, 2005





# ERC is Different



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## Scientific Governance

- Independent Scientific Council with 22 members including the ERC President; full authority over funding strategy and evaluation
- Support by a Dedicated Implementation Structure (ERC Executive Agency)

## Scientific Freedom

- Scientific quality as the only criterion for selection
- Support to the individual scientist – no consortia!
- No predetermined subjects (bottom-up)
- Support to Frontier Research in all fields of Science and Humanities
- International peer-review

# ERC Grants Schemes



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## Starting Grants

starters  
(2-7 years after PhD)  
up to 1.5 M€  
for 5 years

## Consolidator Grants

consolidators  
(7-12 years after PhD)  
up to 2 M€  
for 5 years

## Advanced Grants

track-record of  
significant research  
achievements in the  
last 10 years  
up to 2.5 M€  
for 5 years

## Proof-of-Concept

bridging the gap between  
research and marketable innovation  
lump sum 150 k€ for ERC grant holders

## Synergy Grants (re-launched 2018)

2 – 4 Principal Investigators  
up to 10 M€ for 6 years  
1 PI can be based outside EU/AC

# Evaluation Panel Structure (2021-2022)



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## Main Novelties:

<https://erc.europa.eu/news/new-erc-panel-structure-2021-and-2022>

**2021-2022:** Contours of panels redefined, descriptors enriched (especially LS), two new panels (PE11, SH7)

## Physical Sciences & Engineering

- PE1 Mathematics
- PE2 Fundamental Constituents of Matter
- PE3 Condensed Matter Physics
- PE4 Physical and Analytical Chemical Sciences
- PE5 Synthetic Chemistry and Materials
- PE6 Computer Science and Informatics
- PE7 Systems and Communication Engineering
- PE8 Products and Process Engineering
- PE9 Universe Sciences
- PE10 Earth System Science
- **PE11 Materials Engineering**

## Life Sciences

- LS1 Molecules of Life: Biological Mechanisms, Structures and Functions
- LS2 Integrative Biology: From Genes and Genomes to Systems
- LS3 Cellular, Developmental and Regenerative Biology
- LS4 Physiology in Health, Disease and Ageing
- LS5 Neuroscience and Disorders of the Nervous System
- LS6 Immunity, Infection and Immunotherapy
- LS7 Prevention, Diagnosis and Treatment of Human Diseases
- LS8 Environmental Biology, Ecology and Evolution
- LS9 Biotechnology and Biosystems Engineering

## Social Sciences and Humanities

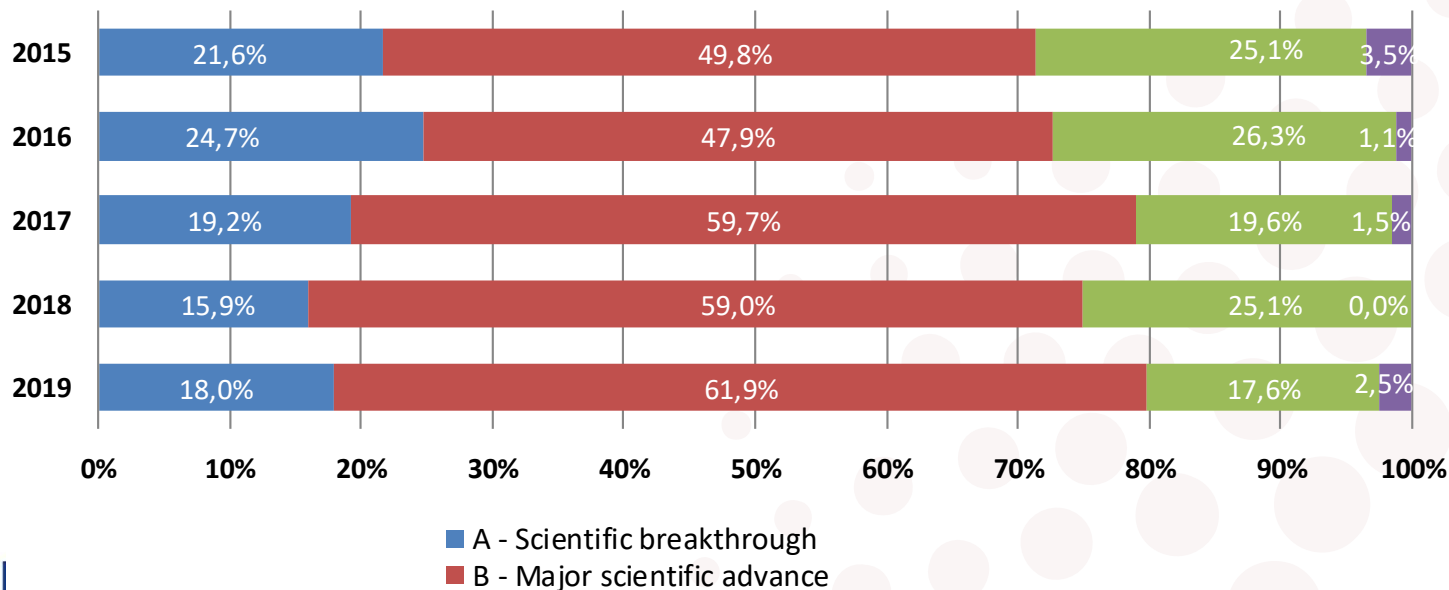
- SH1 Individuals, Markets and Organisations
- SH2 Institutions, Governance and Legal Systems
- SH3 The Social World and Its Diversity
- SH4 The Human Mind and Its Complexity
- SH5 Cultures and Cultural Production
- SH6 The Study of the Human Past
- **SH7 Human Mobility, Environment, and Space**

# Ex-post Evaluation of ERC Projects



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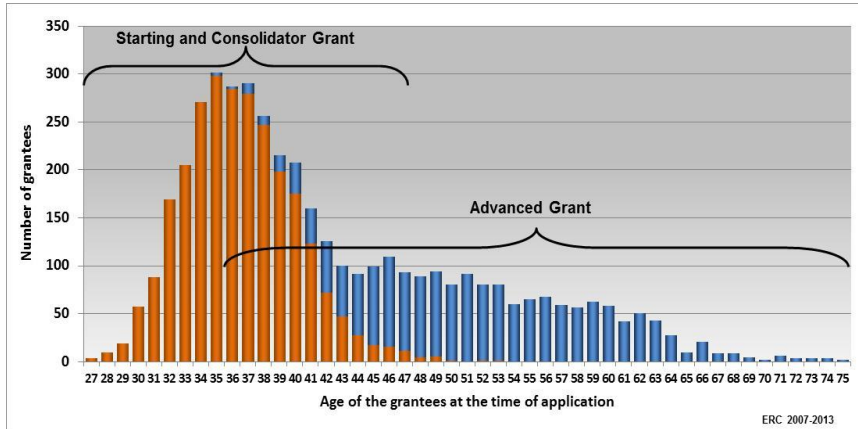
## Qualitative evaluation of completed ERC projects Overall results from 2015 to 2019



# Priority to Young Scientists

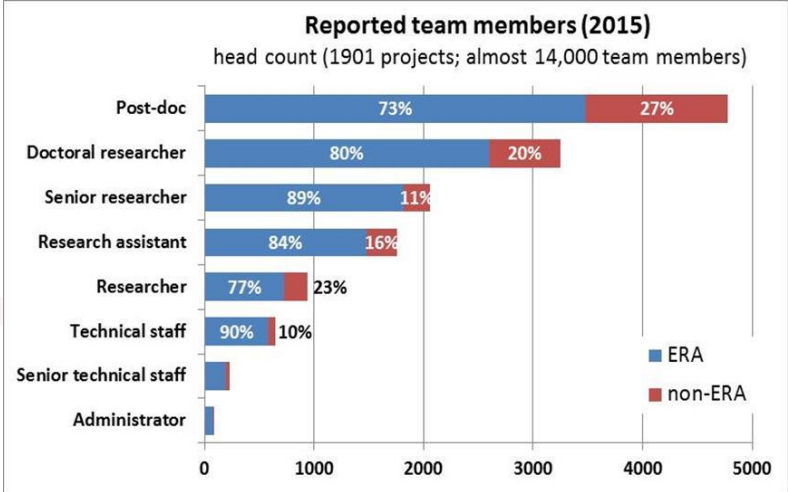


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> 45 000 PhD and post-doc researchers working in ERC teams

Two-thirds of ERC grants to early-stage Principal Investigators



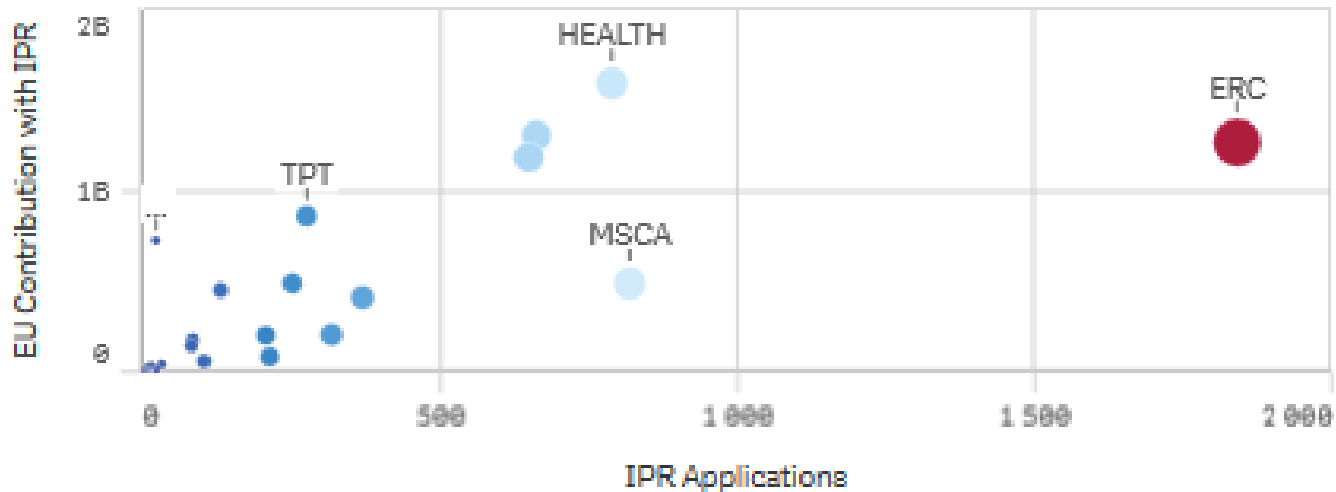
# Highest Impact of FP7 and H2020 Programmes



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Horizon  
Dashboard

IPR Applications by Research research Thematic Priority

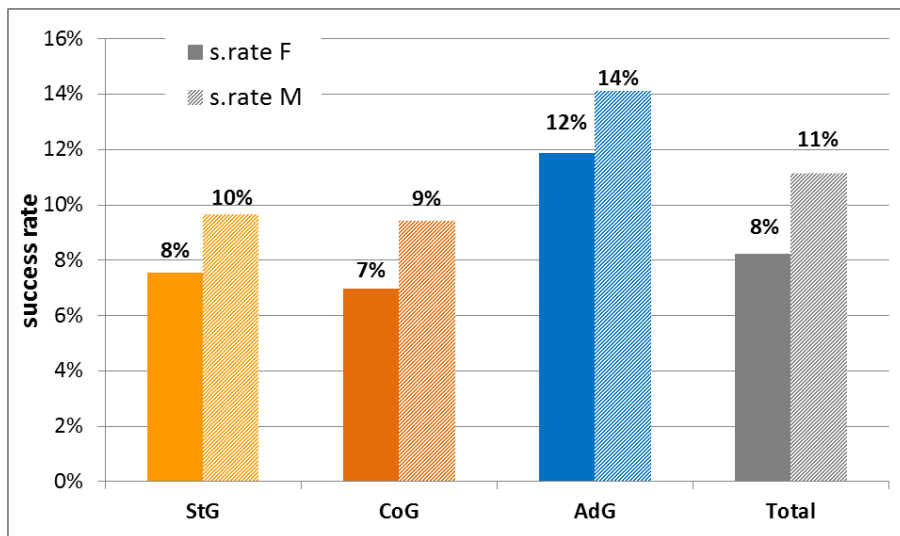


# Success Rate by Gender and Call

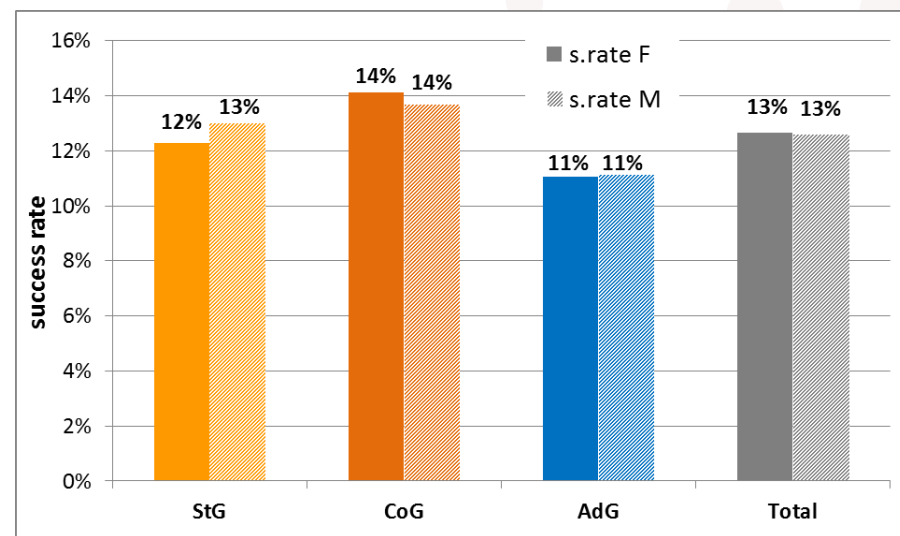


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## FP7 (2007-2013)



## Horizon 2020 (2014-2018)



# Excellent Proposals not funded by ERC

*In the ERC calls 2012-2019\*, 11 023 proposals received the top “A” score, but 33% of them, i.e. 3600 proposals, could not be funded due to an insufficient ERC budget (requested grant value missing: nearly 7 billion euro). This reveals a large scientific potential that remains unmet due to ERC financial limitations.*

With its current budget the ERC is forced to turn down hundreds of excellent proposals every year.

HI country	A-scored proposals	Funded	Unfunded	%Unfunded	Missing (M€)
UK	2260	1499	761	34%	1,513
DE	1800	1208	592	33%	1,127
FR	1336	901	435	33%	839
NL	958	690	268	28%	534
CH	709	497	212	30%	432
ES	624	403	221	35%	416
IL	598	413	185	31%	369
IT	532	353	179	34%	305
Other	2206	1459	747	34%	1,425
<b>Total</b>	<b>11023</b>	<b>7423</b>	<b>3600</b>	<b>33%</b>	<b>6,961</b>





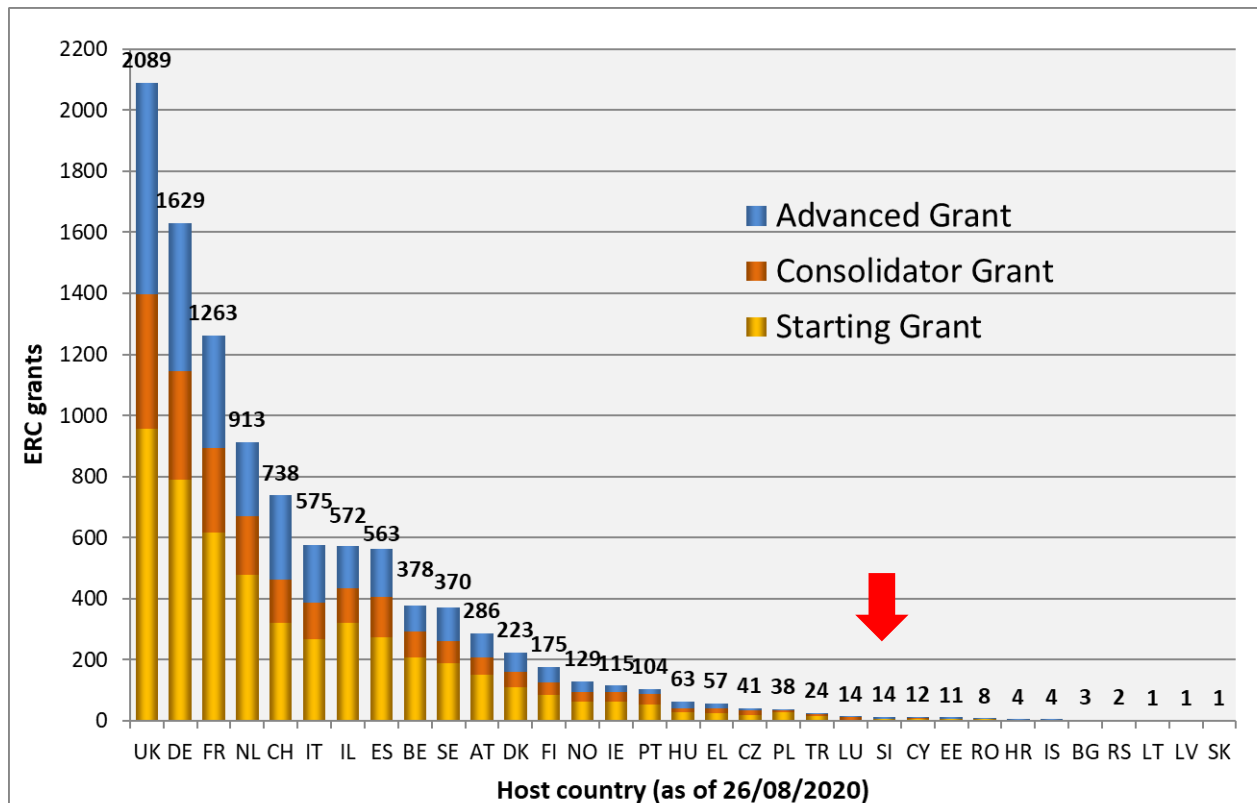
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# ERC Grants in Slovenia

# ERC Grants by Host Country



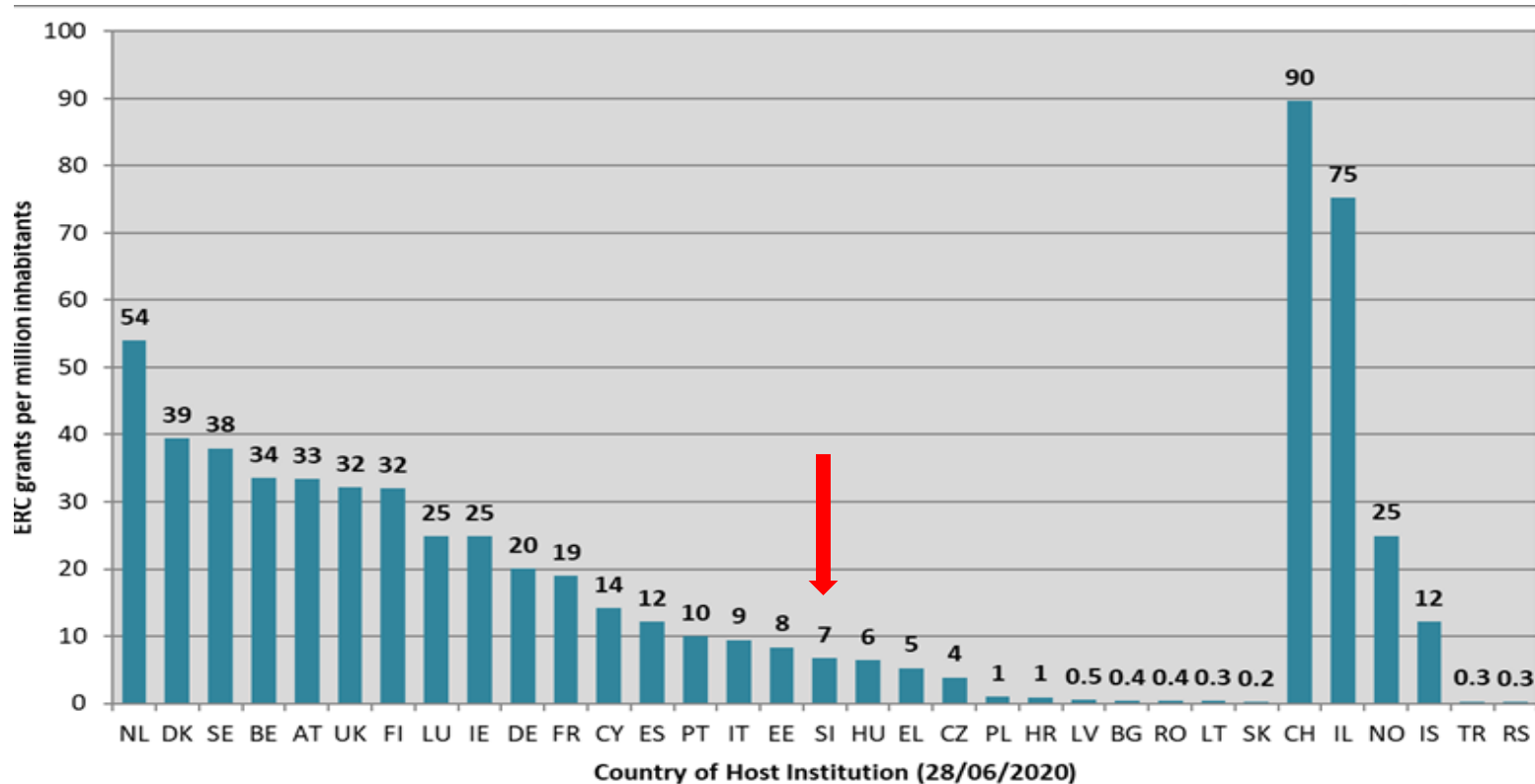
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# ERC Grants per Million Population



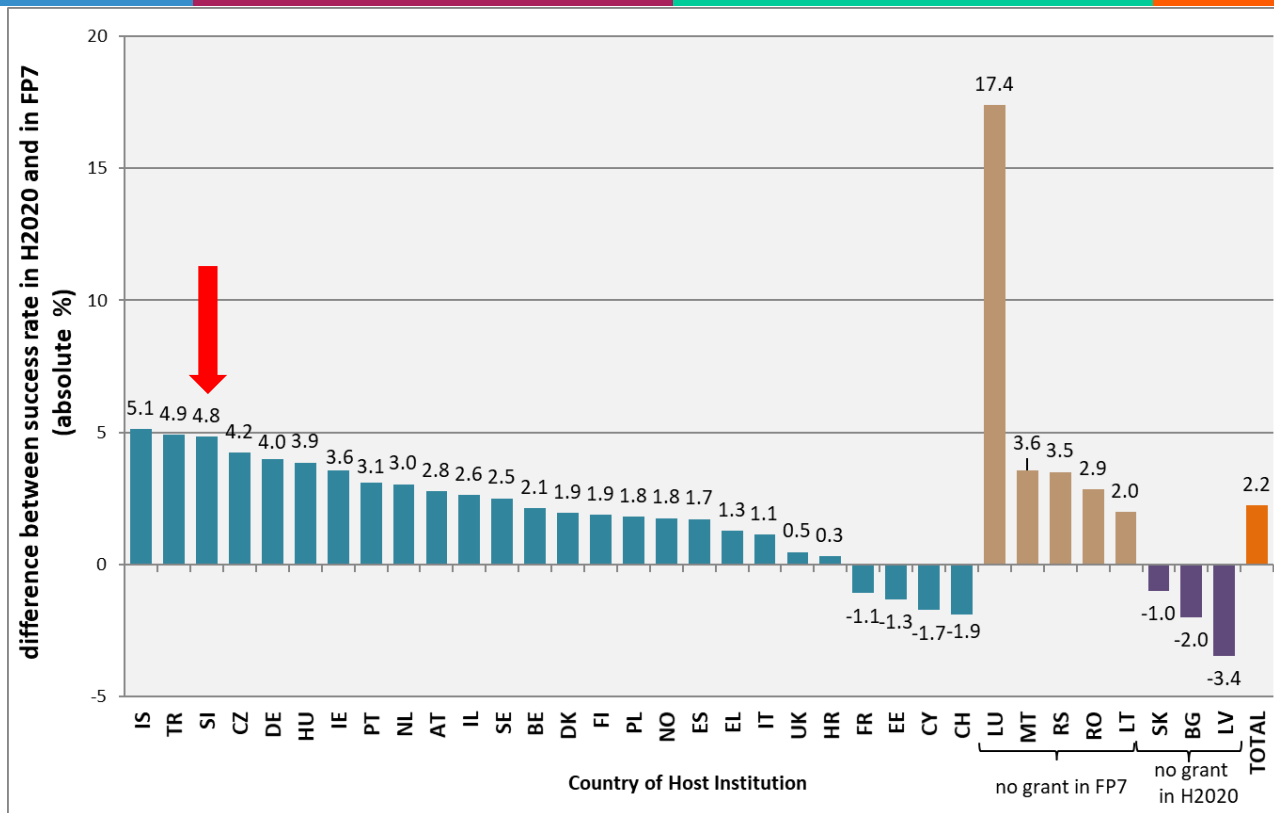
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# Success Rates Horizon 2020 vs FP7 ERC Calls



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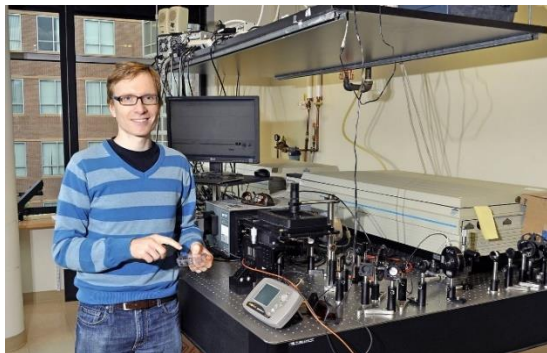


# ERC StG 2019 Grantees in Slovenia



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**Dr. Matjaž HUMAR,**  
*Josef Stefan Institute, Ljubljana*  
PE - Physical Sciences and Engineering  
**Cell-lasers “Intracellular lasers:  
Coupling of optical resonances with  
biological processes”**



**Dr. Nejc HODNIK,**  
*National Institute of Chemistry,  
Ljubljana*  
PE - Physical Sciences and Engineering  
**123STABLE - “Towards Nanostructured  
Electrocatalysts with Superior Stability**



## Visiting Fellows Programme

**Scheme:** Short term research visit (from one to 6 months) in an ERC team: international exposure, grant application coaching.

**Funding:** by ARRS, no additional funding is provided by ERC.

**Eligibility:** Open to researchers funded by ARRS, based on excellence and potential for an ERC grant application.

**Condition:** Selected applicants will be hosted as members of an ERC research team.

**Successful applicants must commit to apply for an ERC grant no later than one/two year(s) after the end of the visit.**



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# ERC in Horizon Europe

# Horizon Europe: Evolution not Revolution



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## Specific objectives of the Programme

Support the creation and diffusion of high-quality knowledge

Strengthen the impact of R&I in supporting EU policies

Foster all forms of innovation and strengthen market deployment

Optimise the Programme's delivery for impact in a strengthened ERA



**Pillar 1**  
Open Science

European Research Council

Marie Skłodowska-Curie Actions

Research Infrastructures



**Pillar 2**  
Global Challenges and Industrial Competitiveness

- Clusters
- Health
  - Inclusive and Secure Society
  - Digital and Industry
  - Climate, Energy and Mobility
  - Food and natural resources

Joint Research Centre



**Pillar 3**  
Open Innovation

European Innovation Council

European innovation ecosystems

European Institute of Innovation and Technology

**Strengthening the European Research Area**

Sharing excellence

Reforming and Enhancing the European R&I system



# The European Research Council



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