Horizon Europe and ERC

Dr Martin Penny
Head of Unit
Physical Sciences & Engineering
ERC Executive Agency

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HORIZON EUROPE IN BRIEF
Horizon Europe (2021-2027)

Pillar 1
Excellent Science
- European Research Council
- Marie Skłodowska-Curie Actions
- Research Infrastructures

Pillar 2
Global Challenges and European Industrial Competitiveness
- Health
- Culture, Creativity and Inclusive Society
- Civil Security for Society
- Digital, Industry and Space
- Climate, Energy and Mobility
- Food, Bioeconomy, Natural Resources, Agriculture and Environment
- Joint Research Centre

Pillar 3
Innovative Europe
- European Innovation Council
- European innovation ecosystems
- European Institute of Innovation and Technology

Widening Participation and Strengthening the European Research Area
- Widening participation and spreading excellence
- Reforming and Enhancing the European R&I system
Horizon Europe Drivers

A sustainable, fair and prosperous future for people and planet based on European values.

- Tackling climate change (35 % budgetary target)
- Helping to achieve the Sustainable Development Goals
- Boosting the Union's competitiveness and growth

While benefiting from world-class research and strong industries.

- Europe can do better at transforming skills and knowledge into leadership in innovation and entrepreneurship
Added value through Horizon Europe

Benefits for Europe

- Trans-national collaboration, exchange and networks
- Critical mass to address global challenges
- Competitive funding promoting excellence
- Visibility for leading research and innovation
- Transnational mobility
- Creating new market opportunities
- Strengthened European R&I landscape
- Attracting the best talents
State of Play

European Parliament and Council reached a common understanding on Horizon Europe on 19 March 2019

Budget, synergies and third country association, discussions still ongoing

Commission has started preparations for the implementation of Horizon Europe
HORIZON EUROPE AND ERC
The European Commission
- Provides financing through the EU framework programmes
- Guarantees autonomy of the ERC
- Assures the integrity and accountability of the ERC
- Adopts annual work programmes as established by the Scientific Council

The ERC Scientific Council
- 21 prominent researchers proposed by an independent identification committee
- President appointed following recommendation of an independent committee
- Appointed by the Commission (4 years, renewable once)
- Establishes overall scientific strategy; annual work programmes (incl. calls for proposals, evaluation criteria); peer review methodology; selection and accreditation of experts
- Controls quality of operations and management
- Ensures communication with the scientific community

The ERC Executive Agency
- Executes annual work programme as established by the Scientific Council
- Implements calls for proposals and provides information and support to applicants
- Organises peer review evaluation
- Establishes and manages grant agreements
- Administers scientific and financial aspects and follow-up of grant agreements
- Carries out communications activities and ensures information dissemination to ERC stakeholders
 Governance by the Scientific Council
Scientific Council Statement on Horizon Europe

✓ Continuity
✓ Agility
✓ Scale-up
"The fundamental activity of the ERC is to provide attractive, long-term funding to support excellent investigators and their research teams to pursue ground-breaking, high-gain / high-risk research."

ERC Work Programme 2020
Principles of ERC funding

Scientific excellence is the sole criterion
Applications can be made in any field of research
Independent researchers of any age and career stage and from anywhere in the world can apply for attractive, long-term funding
Host institutions must provide independence for the Principal Investigator to direct the research and manage its funding
Excellence is the sole evaluation criterion

<table>
<thead>
<tr>
<th>Excellence of the Research Project</th>
<th>Excellence of the Principal Investigator</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Ground breaking nature</td>
<td>✓ Intellectual capacity</td>
</tr>
<tr>
<td>✓ Potential impact</td>
<td>✓ Creativity</td>
</tr>
<tr>
<td>✓ Scientific Approach</td>
<td>✓ Commitment</td>
</tr>
</tbody>
</table>
Generous grants

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

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

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

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

Synergy Grants
2 – 4 Principal Investigators
up to €10.0M for 6 years
1 PI can be based outside EU/AC
ERC: Changes for Horizon Europe

Continuity....

Two changes:

1. Interviews for Advanced Grantees
2. Panel Structure
Innovative panel structure reflects overriding principles of ERC evaluation policy:

- **Coherence:**
  - ERC covers all fields of sciences
  - Vision of science as transcending domains and disciplines

- **Forward-looking:**
  - Focus on frontier research and excellence only
  - Instigate transformative changes in research landscape
  - Signal openness to changes in paradigm

- **Evolving nature of disciplines, critical role of interdisciplinarity:**
  - Low number of panels $\Rightarrow$ wide breadth of viewpoints within panels
  - Panels to be interpreted in flexible and inclusive manner
Rationale for revision

- **Scientific needs:**
  - Modernise to reflect scientific reality better
  - Integrate parts of science that were so far only implicitly covered
  - Encourage applicants who may not have felt “at home” so far
  - Ensure coherence of each panel

- **Practical needs:**
  - Rebalance panel size for fairness and feasibility of evaluation process
New Panel Structure

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

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

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
Impact for applicants

- New panel structure applicable as of Starting Grant 2021
- Overriding aim is to tap into full potential of applicants in all areas of science
- Proactive communication effort by ERC Scientific Council and Agency
- Publication of full revised panel structure well ahead of time
- Applicants are advised to familiarise themselves with the changes
- No change in evaluation process linked to this revision
ERC ACHIEVEMENTS
ERC Achievements

“You are our jewel in the crown. You are one of the best things to happen in Europe in the last 10 years.”

ERC 10th anniversary Speech by Commissioner MOEDAS, 21 March 2017
Established by the European Commission

The Nobel Prize in Economics 2014 was awarded to Jean Tirole "for his analysis of market power and regulation".

The Nobel Prize in Physiology or Medicine 2014 was awarded to May-Britt Moser and Edvard Moser, together with John O'Keefe, "for their discoveries of cells constituting a positioning system in the brain".

The Nobel Prize in Chemistry 2016 was awarded to Bernard L. Feringa "for the design and synthesis of molecular machines". jointly with Jean-Pierre Sauvage and Sir J. Fraser Stoddart.

Highest Prizes to ERC Grantees

Fields Medals: in 2010 Stanislav Smirnov for "the conformal invariance of the percolation model"; in 2014 Artur Avila and Martin Hairer "for their work in stochastic singularities and dynamical systems and", and in 2018 to Alessio Figalli "for his work on Calculus of Variations".
Nobel Prize in Physiology or Medicine 2019

Awarded jointly to William G. Kaelin Jr, Sir Peter J. Ratcliffe and Gregg L. Semenza "for their discoveries of how cells sense and adapt to oxygen availability."

Sir Peter J. Ratcliffe is Co-Principal Investigator of an ERC Advanced grant 2008 project Title: "Project Molecular Mechanism of Oxygen Sensing by Enzymes"
Host Institution: University of Oxford
ERC World Best Major Research Funder

- ERC had the highest category normalised citation impact, the highest percentage of papers in the world’s top 1% and the highest percentage of papers involving international co-authorship of the top 50 funders.

- Of the 100 most frequently acknowledged funders, only three (all large pharmaceutical companies) have a higher citation impact – though not substantially higher.
Highest Impact of Horizon 2020 Programmes

Scientific Publications by Research Thematic Priority

- ERC: 149,490 publications
- ICT: 51,422 publications
- NMP: 20,297 publications
- MSCA: 10,692 publications

Horizon Dashboard
Ex-post Evaluation of ERC projects

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

<table>
<thead>
<tr>
<th>Year</th>
<th>A - Scientific breakthrough</th>
<th>B - Major scientific advance</th>
<th>C - Significant</th>
<th>D - Good</th>
<th>E - Average</th>
<th>F - Below average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>21,6%</td>
<td>49,8%</td>
<td>25,1%</td>
<td>3,5%</td>
<td></td>
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</tr>
<tr>
<td>2016</td>
<td>24,7%</td>
<td>47,9%</td>
<td>26,3%</td>
<td>1,1%</td>
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<tr>
<td>2017</td>
<td>19,2%</td>
<td>59,7%</td>
<td>19,6%</td>
<td>1,5%</td>
<td></td>
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<tr>
<td>2018</td>
<td>15,9%</td>
<td>59,0%</td>
<td>25,1%</td>
<td>0,0%</td>
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<td></td>
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<tr>
<td>2019</td>
<td>18,0%</td>
<td>61,9%</td>
<td>17,6%</td>
<td>2,5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A - Scientific breakthrough  
B - Major scientific advance  
C - Significant  
D - Good  
E - Average  
F - Below average
Highest Impact of Horizon 2020 Programmes

Horizon 2020 Dashboard

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-dashboard
More than 100 Spin-off Companies
ERC AND PORTUGAL
ERC Evaluated Proposals by Country

The chart shows the evaluated ERC proposals by country from 2007 to 2019, categorized according to the type of grant:
- **AdG 2008-2019**
- **CoG 2013-2019**
- **StG 2007-2019**

The chart is divided into three main categories:
- **EU15 - 85%**: Proposals from the 15 countries that were part of the EU15 before 2004.
- **EU13 - 6%**: Proposals from the 13 countries that joined the EU after 2004.
- **A.C. - 9%**: Proposals from other countries that are not part of the EU.

The countries are listed on the x-axis, with the number of evaluated proposals on the y-axis.
ERC Funded Projects by Country

Host country (as of 25/03/2020)

- Advanced Grant
- Consolidator Grant
- Starting Grant

<table>
<thead>
<tr>
<th>Country</th>
<th>ERC grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>2027</td>
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<tr>
<td>DE</td>
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<tr>
<td>FR</td>
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<td>LT</td>
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<td>LV</td>
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<tr>
<td>SK</td>
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</tbody>
</table>
ERC Funded Projects by Domain

Host country (as of 25/03/2020)

- **LS** – 49
- **PE** – 29
- **SH** – 20
Success Rates by Domain

*ERC calls 2007-2019*

- Orange circles: LS
- Green circles: PE
- Blue circles: SH

*Country of Host Institution*
Success Rate by Country

Success rate (2007-2019)
ERC Nationals at Home and Abroad

Established by the European Commission

- 14 foreign grantees in Portugal
- 84 PIs with Portuguese nationality in Portugal
- 61 Portuguese PIs abroad (60% in UK and FR)

ERC 2007-2019 calls
Top Host Institutions in Portugal

- University of Lisbon: 8 StG, 6 CoG, 3 AdG
- New University of Lisbon: 9 StG, 5 CoG, 2 AdG
- Champalimaud Foundation: 5 StG, 8 CoG, 2 AdG
- Calouste Gulbenkian Foundation: 5 StG, 4 CoG, 1 AdG
- University of Porto: 7 StG, 2 CoG, 1 AdG
- University of Minho: 1 StG, 3 CoG, 2 AdG
- University of Coimbra: 3 StG, 2 CoG, 1 AdG
- University of Aveiro: 1 StG, 2 CoG, 2 AdG
- Technical University of Lisbon: 2 StG, 1 CoG, 2 AdG

Current Host Institutions (data as of 25/03/2020)
ERC AND YOU
The European Research Council

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