

The European Research Council



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The ERC: a Success Story for the EU

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Head of Unit

May 2017



European
Commission

Horizon 2020
European Union funding
for Research & Innovation

Celebrating ERC-10 in Europe and beyond



- ✓ ERC Week: 13-19 March
- ✓ 140 events in 38 countries
- ✓ New website:
erc.europa.eu





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Beyond the first 10 years

The ERC in a Nutshell

The ERC in a Nutshell



- Set up in 2007 by the EU, the ERC funds ambitious projects in frontier research. It aims at:
 - Supporting excellent frontier research throughout Europe in all scientific domains: Life Sciences (LS), Physical Sciences and Engineering (PE), and Social Sciences and Humanities (SH)
 - Retaining and attracting the best scientific talent to Europe, by offering very substantial grants for up to 5 years



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

- **22 prominent researchers** proposed by an independent identification committee
- **President** appointed following recommendation of an independent search committee
- **Appointed by the Commission** (4 years, renewable once)
- **Establishes overall scientific strategy**; annual work programmes; 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

The ERC Scientific Council



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BOURGUIGNON
Jean-Pierre



Vice
President

BOCK
Klaus



Vice
President

KONDOROSI
Eva



Vice
President

STOKHOF
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BUCKINGHAM
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Christopher



CRONE
Eveline



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Andrzej



JUNGWIRTH
Tomas



KRAMER
Michael



MEHLHORN
Kurt



ROMANOWICZ
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Giulio



TAVERNARAKIS
Nektarios



THORNTON
Janet



VERNOS
Isabelle



VEUGELERS
Reinhilde



WIEVIORKA
Michel



ZWIRNER
Fabio

The ERC in a Nutshell

- Funding schemes set up **"for scientists, by scientists"**
- Open to top researchers of **any nationality, age and gender, from anywhere in the world**, to perform research in Europe
- Long-term, individual grants for **ground-breaking, high-risk/high-gain research**: Starting Grants (€1.5 million), Consolidator Grants (€2 million) and Advanced Grants (€2.5 million)
- **No thematic priorities**; any field of research (life sciences, physical sciences & engineering, social sciences & humanities)
- **Bottom-up**, curiosity-driven approach
- Sole selection criterion: **scientific excellence**
- Selection based on international **high-quality peer review**

The ERC in a Nutshell

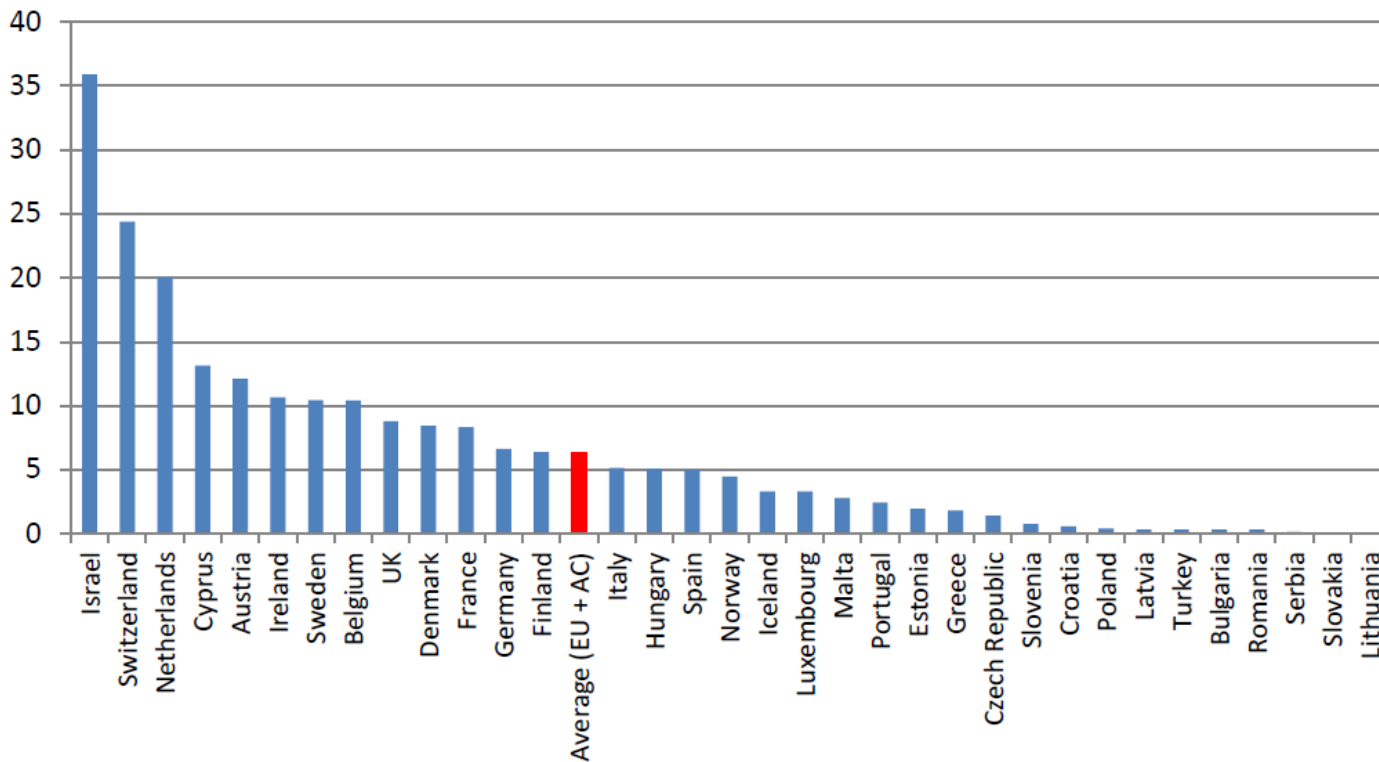


- ✓ The ERC is a key component of Horizon 2020, the EU programme for Research and Innovation
- ✓ €13 billion budget for 2014-2020, i.e. 17% of the Horizon 2020 budget
- ✓ Over 60,000 applications received and around 7,000 projects funded
- ✓ Highly competitive calls: success rate is around 11%

No. of ERC grants per 1000 researchers



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Substantial, long-term Grants



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Starting Grants

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

Consolidator Grants

Consolidators
(7-12 years after PhD)
up to € 2 Mio
for 5 years

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

Proof-of-Concept

bridging gap between research - earliest
stage of marketable innovation
up to €150,000 for ERC grant holders

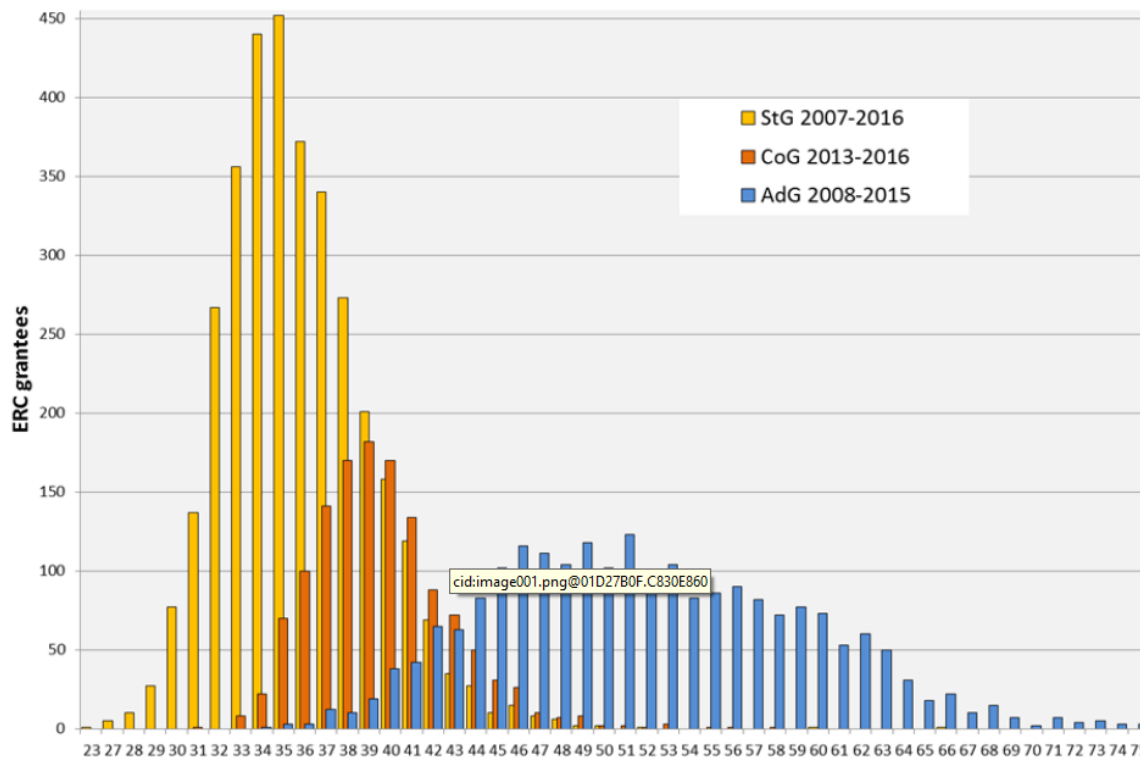
Synergy Grants

2 – 4 Principal Investigators
up to € 10 Mio for 6 years

Age of grantees



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Evaluation Panel Structure



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Life Sciences

- LS1 Molecular and Structural Biology and Biochemistry
- LS2 Genetics, Genomics, Bioinformatics and Systems Biology
- LS3 Cellular and Developmental Biology
- LS4 Physiology, Pathophysiology and Endocrinology
- LS5 Neurosciences and Neural Disorders
- LS6 Immunity and Infection
- LS7 Diagnostic Tools, Therapies and Public Health
- LS8 Evolutionary, Population and Environmental Biology
- LS9 Applied Life Sciences and Non-Medical Biotechnology

Physical Sciences & Engineering

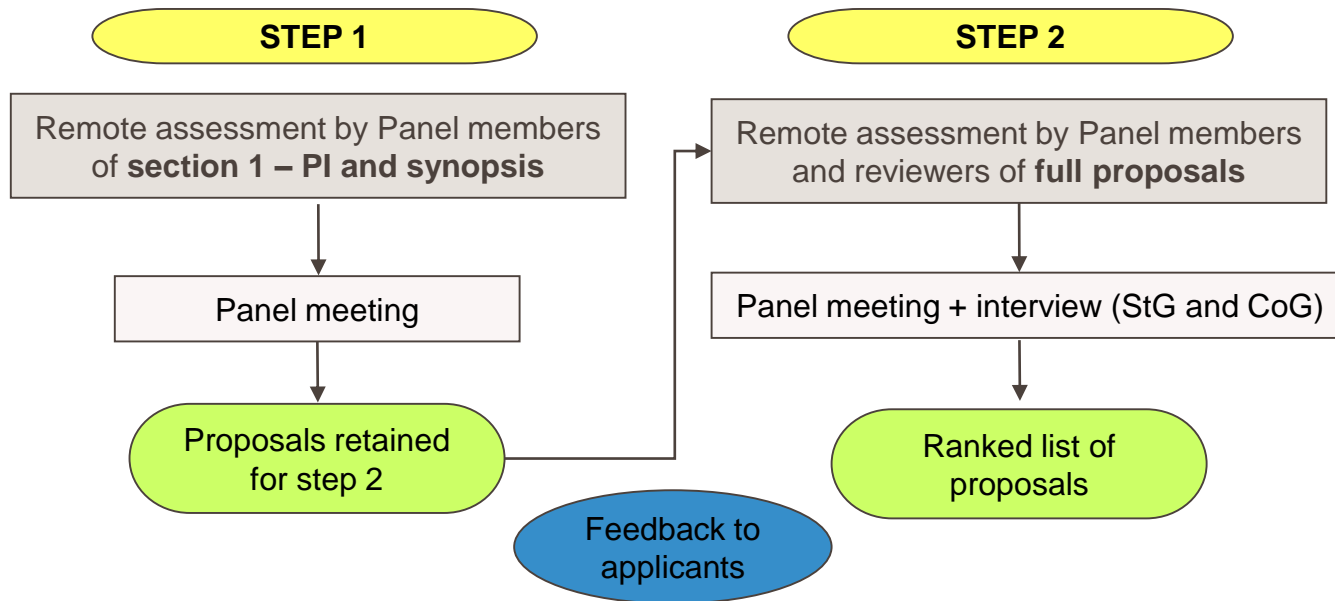
- PE1 Mathematics
- PE2 Fundamental Constituents of Matter
- PE3 Condensed Matter Physics
- PE4 Physical and Analytical Chemical Sciences
- PE5 Synthetic Chemistry and Materials
- PE6 Computer Science and Informatics
- PE7 Systems and Communication Engineering
- PE8 Products and Process Engineering
-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

Social Sciences and Humanities

- SH1 Individuals, Markets and Organisations
- SH2 Institutions, Values, Environment and Space
- SH3 The Social World, Diversity, Population
- SH4 The Human Mind and Its Complexity
- SH5 Cultures and Cultural Production
- SH6 The Study of the Human Past

Evaluation of proposals

Review procedure

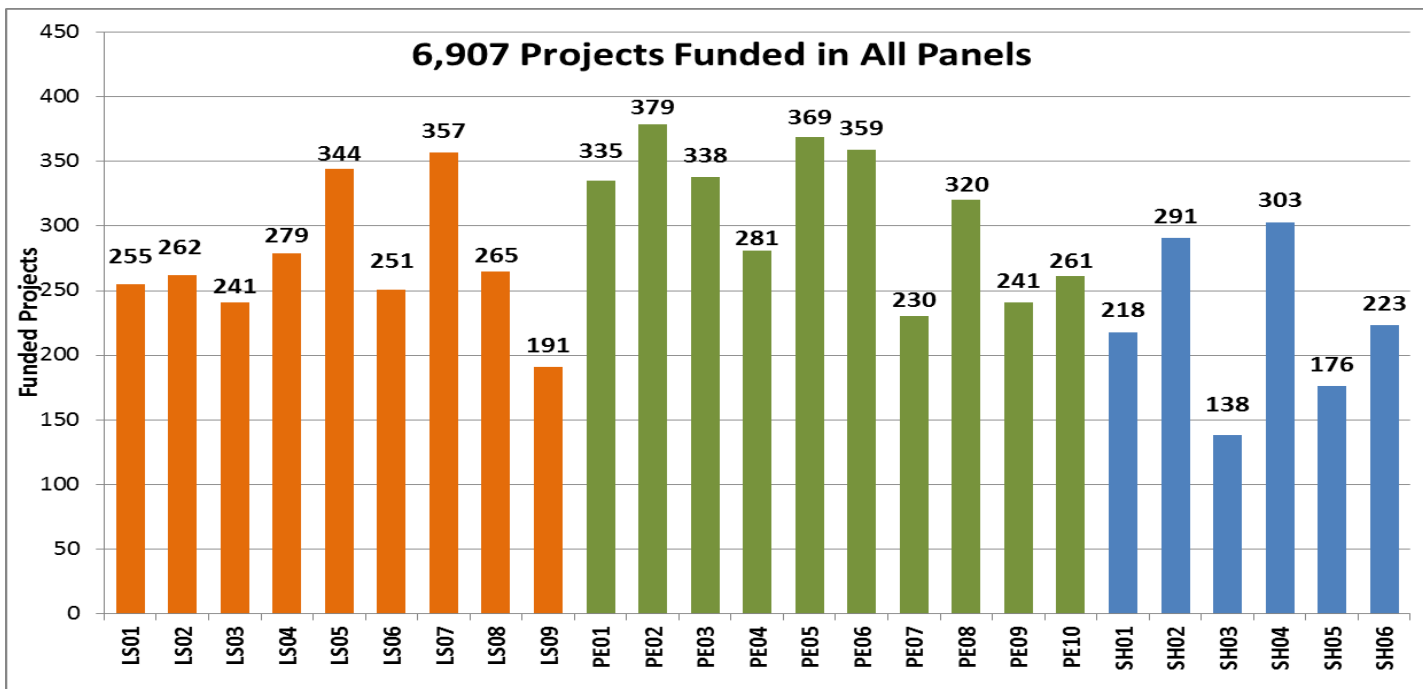


- Right balance between generalist + specialized review

Distribution of ERC Grants by Panel



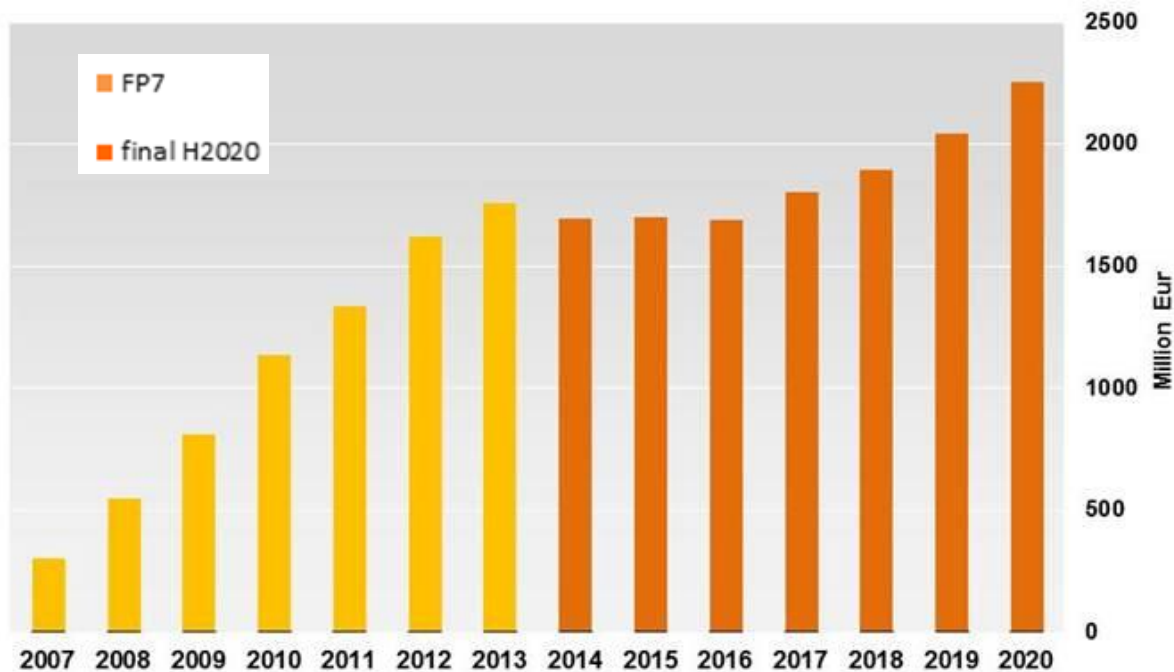
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Budget



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Beyond the first 10 years

Information for Applicants

Who can apply?

- **Excellent** Researchers
- **Any nationality, any age** or any current place of work
- In conjunction with a Host Institution
 - Based in Europe
EU or associated countries
 - At least 50% of the time spent in Europe

ERC Starting Grants

The applicant's profile

"Am I competitive enough?"

- **Potential** for research **independence**
- Able to develop ground-breaking idea, think out of the box
- Evidence of scientific maturity & **creativity**
- At least one publication without participation of PhD supervisor

Promising track-record of early achievements

- Significant publications, contribution to the field
- Invited presentations in conferences
- Funding, patents, awards, prizes

ERC Consolidator Grants

The applicant's profile

"Am I competitive enough?"

- Research **independence**
- Able to develop ground-breaking ideas, think out of the box
- Evidence of scientific maturity & **creativity**
- Several publications without participation of PhD supervisor

Promising track-record of early achievements

- Significant publications, contribution to the field
- Invited presentations in conferences
- Funding, patents, awards, prizes

ERC Advanced Grants

The applicant's profile

Already a leader in the field?

- Track-record of significant research achievements **in the last 10 years**
- Exceptional **leaders** and **mentors**
- 10 publications as senior author in major scientific journals
- 5 granted patents
- 10 invited presentations at international conferences
- 3 international conferences where applicant was an organiser
- International prizes/awards

Role of the Host Institution

- Hosts the PI and is located in **EU Member State** or **Associated Country**
- Is a legal entity: university, research center, business research unit, etc.
- Is committed to ensure that the PI may:
 - ✓ Apply for funding independently
 - ✓ Manage research and funding project
 - ✓ Publish independently as senior author
 - ✓ Have access to reasonable space and facilities
- Signs Grant Agreement
- Overhead: 25%

Main features evaluation of proposals

- Goal of the evaluation: select the best **frontier research proposals**
- Only evaluation criteria: **excellence** of the Principal Investigator and the Project
- Method: **Two steps**, peer review
- Structure: **25 panels** (10-15 experts/panel)

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10 Reasons to Celebrate

1. Supporting Research Talent

- ✓ 7,000 "research champions" and their teams supported
- ✓ 50,000 team members, mostly PhDs and postdocs, working on ERC projects



2. Advancing the Frontiers of Knowledge

- ✓ 73% of a sample of completed ERC projects resulted in scientific breakthroughs or major advances
- ✓ ERC grantees won prestigious awards:
6 Nobel Prizes, 5 Wolf Prizes, 4 Fields Medals, ...



3. Enhancing Visibility of European Research Results

- ✓ 100,000 publications resulting from ERC projects
- ✓ 7% of these publications rank in the top 1% most cited worldwide. Also thanks to this, in 2014 Europe surpassed the US for the first time in this top 1%.



4. Attracting Scientific Talent

- ✓ The ERC tackles the brain-drain by making Europe a more attractive place for bright minds
- ✓ Around 17% of the ERC team members are from non-EU countries
- ✓ 9 countries (including US, China, Korea, Brazil) have signed specific agreements with the EU that allow ERC grantees to cooperate with young scientists from around the world



5. Promoting Innovation



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- ✓ There is no innovation without frontier research!
- ✓ Almost 600 Proof of Concept Grants awarded
- ✓ ERC projects have led to 800 patent applications and setting up 75 new ventures (2007-2013)



ERC Research Turns into A.I. Spin-Off

- ❖ Breakthrough technology to automate data extraction from content on the web developed thanks to ERC funding
- ❖ February 2017: spin-off **Wrapidity** was purchased by Meltwater, a leader in data intelligence.

Prof. Georg GOTTLOB, *University of Oxford*

DIADEM (Domain-centric Intelligent Automated Data Extraction Methodology) ERC Advanced Grant 2009
+ **ExtraLytics**, 2014 Proof of Concept



[Yahoo Finance](#), 22 February 2017

Meltwater acquires Oxford University data extraction spinout Wrapidity

Energy storage: better, more efficient

Method: uses of 2-dimensional nanomaterials, including graphene, to create and print batteries

Result: could increase the lifetime of a battery of about 5000 times

Valeria Nicolosi, Trinity College Dublin
(Ireland)

3D2DPrint (3D Printing of Novel 2D
Nanomaterials: Adding Advanced 2D
Functionalities to Revolutionary Tailored
3D Manufacturing)



6. Addressing Societal Challenges

- ✓ The ERC funds projects related to major health challenges, energy efficiency, demographic changes, etc.
- ✓ ERC-funded research contributes to economic growth and benefits the society at large



Paths to Success for 2nd-Generation Migrants

- ❖ The ERC project studied the factors behind second-generation migrants' success in overcoming barriers to employment in four countries
- ❖ Policy makers use the findings to better support migrant communities

Prof. Maurice CRUL, *Erasmus University Rotterdam*

ELITE (Elite Leadership Positions In The Emerging Second Generation) ERC Starting Grant 2011



Catalysts and Ultra-Clean Fuels

- ❖ The ERC research team developed a technique to produce high-quality diesel fuel that uses feedstock more efficiently, generates fewer by-products and results in much lower emissions.

Prof Krijn Pieter DE JONG, Utrecht University

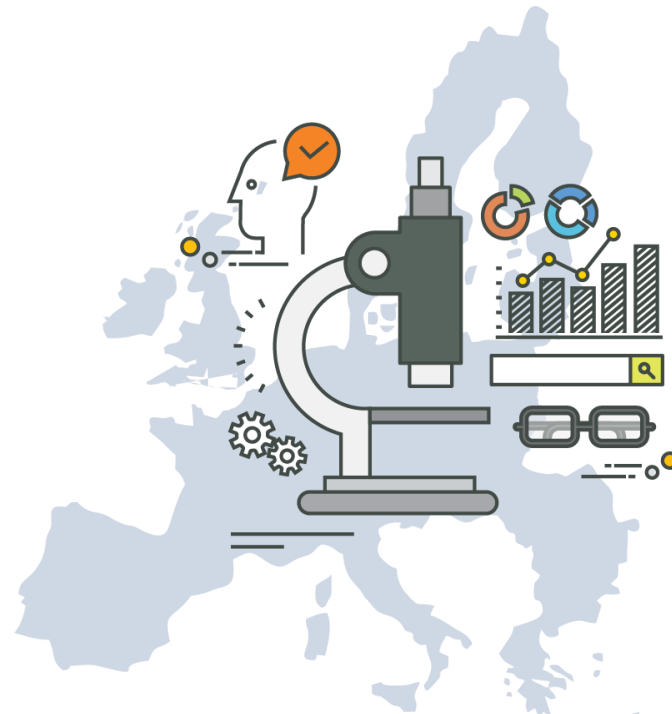
NanoPartCat (Supported Nanoparticles for Catalysis: Genesis and Dynamics in the Liquid Phase), ERC Advanced Grant 2013



ERC story:
Controlled Catalysis for ultra-clean fuels

7. Inspiring Reforms in Europe

- The ERC has set the benchmark of competitive funding of basic research
- New scientific councils and funding schemes launched in EU Member States
- 17 countries have introduced initiatives to finance their best unfunded applicants



8. Engaging with the Scientific Community

- ✓ Research integrity
- ✓ Open access
- ✓ Gender balance
- ✓ Widening European participation



9. Boosting Research Careers

- ✓ 2/3 of ERC grants go to early career researchers
- ✓ ERC grants have a strong, positive effect on grantees' careers
- ✓ They contribute to the consolidation of research teams
- ✓ Key role in training and developing a new generation of top scientists



10. Raising an International Visibility

Wide media coverage



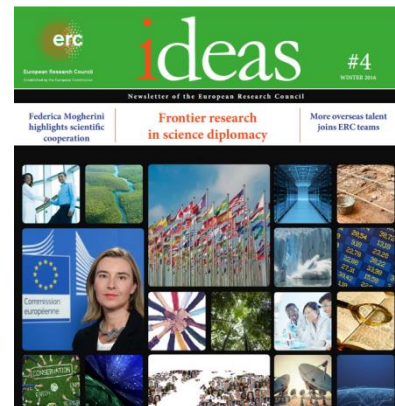
10.000 articles in the media every year



Events around the world



> 500.000 visitors of the ERC website per year





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The Secrets of the ERC Success

The secrets of a success

- ✓ The Scientific Council: 22 renowned scientists as decision makers
- ✓ The evaluators: high-level scientists from all over the world
- ✓ Strict bottom-up approach: no thematic priorities, all disciplines eligible
- ✓ Scientific and financial independence of the grantees
- ✓ The size of the grants: €1.5 million for Starting Grants, €2 million for Consolidator Grants, €2.5 million for Advanced Grants
- ✓ The simplicity of the schemes and of the procedures
- ✓ A very efficient management by the executive agency (ERCEA)



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Examples of projects

Earth-like Exoplanets Discovered

Credit: ESO/N. Bartmann/spaceengine.org



"Without the EU funding it would not have been possible to arrive at this discovery. I'm grateful that the European Research Council invested in our idea and believed in our intuition back in 2013."

Method: A network of telescopes to detect exoplanets orbiting dwarf stars.

Result: Pilot project discovered a system of 7 potentially inhabitable exoplanets

Prof Michaël GILLON, Université de Liège (Belgium)

SPECULOOS (searching for habitable planets amenable for biosignatures detection around the nearest ultra-cool stars), ERC Starting Grant 2013

Playing dirty against allergies and asthma



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Method: studied the link between environmental factors (e.g. microbial exposure) and genetic factors in allergy and asthma occurrence

Results highlighted the protective role of some bacterial and fungal chemicals

Erika Von Mutius, Ludwig-Maximilians-Universitaet Muenchen, Germany

HERA (Host-environment interactions in the protection from asthma and allergies)

ERC Advanced Grant 2009



'Mini Human Brains' to Study Neurological Diseases

Method: Researchers used human stem cells to grow pea-sized structures that resemble the developing human brain

Use: These tissues provide a tool for modelling neurodevelopmental disorders such as microcephaly

Jürgen KNOBLICH, Institute of Molecular Biotechnology GmbH (IMBA) (Austria) & Andrew JACKSON, University of Edinburgh (UK) were part of the team

NeuroSyStem (A Systems Level Approach to Proliferation and Differentiation Control in Neural Stem Cell Lineages), ERC Advanced Grant 2009

HumGenSize (Cellular pathways determining growth and human brain size), ERC Starting grant 2011



Hidden Medieval Cities Uncovered in Cambodia

Method: A laser radar mounted on a helicopter to scan the jungle in the Angkor region

Result: Discovery of unknown human activity dating back to prehistory

Prof Damian EVANS, École française d'Extrême-Orient (France)

CALI (Cambodian Archaeological Lidar Initiative), ERC Starting Grant 2014



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- More information: erc.europa.eu
or watch: <https://player.vimeo.com/video/154715819>
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Thank you!



Key figures

7,000

top researchers funded

50,000

researchers & other professionals
hired in ERC teams

with **€12 billion**



Breakthroughs

73%

of completed projects
led to breakthroughs/major
advances



Scientific impact

> 5,500

articles among
1% most cited
scientific journals



Open to the World

9

international initiatives
for non-EU talent
to join ERC teams



Prestigious prizes, e.g.

6

Nobel
Prizes

5

Wolf
Prizes

4

Fields
Medals



ERC as model

15

EU countries set up
ERC-like structures/funding
schemes