



**Research & Innovation cooperation under
HORIZON 2020**

***the European Framework Programme
for Research & Innovation (2014-2020)
and other schemes***

A guide for Pakistani users



HORIZON 2020
*Excellent Science
Global Challenges
Competitive Industries*
Open to the world!

European Commission

Research and Innovation

01.08.2017



This document is primarily intended for on-line interactive reading, in the sense that it includes many links to relevant websites, which readers are invited to inspect where appropriate (by clicking on those links). For more convenience, the explicit URLs of these websites are provided as end notes.

This brochure was prepared by the Research & Innovation Section of the EU Delegation.

The information provided in this brochure is intended for general information purposes only, and therefore represents a simplified summary of the rules and other features of Horizon 2020. Therefore this document should neither be considered to be binding nor to constitute a commitment by the European Commission. Fully accurate, up-to-date and legally binding information is only to be found in official documents of the European Commission such as Regulations, Work Programmes, Calls for Proposals or Grant Agreements, and on related web sites such as <http://ec.europa.eu/programmes/horizon2020>.

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1. WHAT IS THE EUROPEAN UNION ?

The EU is a unique economic and political partnership between (today) 28 European countries that together cover much of the European continent.

The EU is not a federal state like the United States of America, since its member states remain independent sovereign nations. Nor is it a purely intergovernmental organisation like the United Nations, because the member states do pool some of their sovereignty – and thus gain much greater collective strength and influence than they could have acting individually. They pool their sovereignty by taking joint decisions (e.g. defining common legislation – Regulations and Directives) through shared institutions such as the European Parliament, which is elected by the EU citizens, and the Council, which represents national governments. They decide on the basis of proposals from the European Commission, which represents the interests of the EU as a whole. More information on the EU can be found on official websites such as [this one](#)ⁱ.

In the EU, Research & Innovation (R&I) is a "mixed competence"¹. This means that, in addition to the "joint" or "horizontal" initiatives developed and implemented by the European Commission, such as the research Framework Programmes, the member states are free to individually develop and implement their own national research programmes, including as regards cooperation with non-European countries such as Pakistan.

2. EUROPEAN RESEARCH AND INNOVATION

The European Union (EU) is one of the leading regions of the world insofar as research and innovation are concerned, as demonstrated by the facts and figures included in the *Innovation Union Competitiveness Report 2013*ⁱⁱ (see also the *recent brochure*ⁱⁱⁱ (2013) on the *European Research Area*) and in the *Innovation Union Scoreboard 2014*^{iv}.

The EU remains today the main knowledge production centre, accounting for almost a third of the world's science and technology production. Indeed, the European Union is responsible for 24% of world expenditure on research, 32% of high impact publications and 32% of patent applications, while representing only 7% of the population.

The EU has managed to maintain its competitive knowledge position to a greater degree than the United States and Japan and is making progress towards its R&D intensity target of 3 % by 2020. The EU also remains a very attractive location for R&D investment: in 2011, the EU was the main destination of FDI in the world, receiving around 30 % of FDI inflows worldwide, more than the United States or Japan.

The *OECD Science, Technology and Industry Scoreboard 2013*^v also reveals very positive trends regarding EU investment in R&D between 2007 and 2011, both in the public and private sectors.

In addition, it may be noted that the EU is intrinsically highly diversified, with 28 member states and more than 20 official languages. This explains that European researchers are

¹ Contrary to the Trade policy, for instance, which is an exclusive competence of the EU – this implies in particular that *Free Trade Agreements* between the EU and non-EU countries are negotiated by the European Commission, and not individually by the EU member states.

not only used and open to cultural and linguistic diversity, but are also frequently involved in international collaborations, in which they integrate swiftly. This also explains that the European research landscape is highly networked. For these reasons, partnering with a European (public or private) research organization usually takes place very smoothly, and is often an effective way to gain access to existing networks. These are certainly important assets when Indo-European collaborations are being considered.

3. SHORT OVERVIEW OF THE KEY OPPORTUNITIES FOR PAKISTANI RESEARCH ORGANISATIONS AND INDIVIDUAL RESEARCHERS

This chapter provides a very short overview of the schemes which are the most relevant for Pakistani stakeholders. These schemes are explained in the further chapters.

3.1. Collaborative research

- Classical collaborative projects under HORIZON 2020
- Collaborative projects resulting from coordinated calls for proposals under H2020

3.2. Opportunities for individual researchers / students

- MSCAs (*Marie Skłodowska-Curie Actions*) fellowships under H2020
- ERC grants (*European Research Council*) under H2020
- Evaluation experts for H2020
- Erasmus+ scholarships

4. HORIZON 2020

4.1. Introduction

[Horizon 2020](#)^{vi}, the EU's new programme for research and innovation, will run from 2014 to 2020 with a budget of nearly EUR 80 billion (current prices, adjusted for inflation). It replaces the *Seventh Framework Programme for Research (FP7)*, which ran from 2007 to 2013 with a budget of around EUR 55 billion.

Horizon 2020 is the biggest EU research and innovation programme ever. It will lead to more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.

Horizon 2020 has been designed to deliver results that make a difference to people's lives. Built on three pillars – *Excellent Science*, *Industrial Leadership* and *Societal Challenges*, further described below – it will fund all types of activities, from frontier science to close-to-market innovation.

H2020 brings all EU-level funding for research and innovation² under one roof, provides a single set of rules and radically slashes red tape. The overarching goal is a more coherent, simpler programme that will make it easier to participate, especially for smaller research organisations and small businesses.

A compact presentation of the new programme can be found in the "[Horizon 2020 in brief](#)"^{vii} leaflet.

The following sections describe the 3 pillars of Horizon 2020.

4.2. ▶ Excellent science

Horizon 2020 will bolster excellence in research and science, by attracting the best brains and helping scientists collaborate and share ideas across Europe and beyond. It will help talented people and innovative firms boost competitiveness, creating jobs along the way, and contributing to a higher standard of living – benefiting everyone.

4.2.1. Frontier research funded by the European Research Council (ERC)

Some of today's most significant inventions are the result of our natural curiosity about the way the world works. Although curiosity-driven research at the frontiers of knowledge is rarely explicitly in support of commercial products, its discoveries nonetheless stimulate countless innovations. However, frontier research is often the first area to face cuts in times of economic difficulty, which is why through the ERC the EU is boosting investment. Excellence is the sole criterion here for EU funding, which is awarded to individual researchers or research teams from Europe but also from non-European countries.

Funding: €13.095 billion

4.2.2. Marie Skłodowska-Curie Actions (MSCAs)

Training and career development, including international mobility, help produce leading researchers. Support is offered to young and experienced researchers to reinforce their career and skills through training, or periods of placement in another country or in the private sector. This gives them new knowledge and experience to allow them to reach their full potential.

Funding: €6.162 billion

4.2.3. Future and emerging technologies (FETs)

Staying at the cutting edge of new technologies will enhance competitiveness and create new, high-skilled jobs – and this means being proactive and thinking one step ahead of the crowd. EU funding is helping to make Europe the best possible environment for responsible and dynamic multi-disciplinary cooperation on new and future technologies.

Funding: €2.696 billion

4.2.4. World-class infrastructure

Research equipment can be so complex and costly that no single research team – or even country – can afford to buy or construct or operate it alone. Examples include: the high powered lasers that serve a diverse research community spanning medicine, materials sciences and biochemistry; specialised high-tech airplanes; or a monitoring station at the bottom of the sea, used for observing climate change. These can cost millions of euro, and need the skills of the world's top experts. EU funding helps pool resources for such large-

² The research Framework Programme per se, the previous *Competitiveness and Innovation Programme* (CIP) and the *European Institute of Innovation and Technology* (EIT).

scale projects, and provides Europe's researchers with access to the very latest, state-of-the-art infrastructure – making new and exciting research possible.

Funding: €2.488 billion

4.3. ▶ Industrial leadership

A number of promising and strategic technologies play a crucial role in today's and tomorrow's industry, such as those used in advanced manufacturing and micro-electronics. But public funding alone is not enough: there is a need to encourage businesses to invest more in research, and target areas where they can work with the public sector to boost innovation.

Businesses gain by becoming more innovative, efficient and competitive. This in turn creates new jobs and market opportunities.

4.3.1. Leadership in enabling and industrial technologies (LEIT)

Horizon 2020 supports the ground-breaking technologies needed to underpin innovation across all sectors, including information and communication technology (ICT) and space. Key enabling technologies such as advanced manufacturing and materials, biotechnology and nanotechnologies, are at the heart of game-changing products: smart phones, high performance batteries, light vehicles, nanomedicines, smart textiles and many more besides. The manufacturing industry is a key employer, providing jobs for 31 million people across Europe.

Funding: €13.557 billion

4.3.2. Other instruments

The "SME instrument" and the "Access to risk finance" components of Horizon 2020 are not described in detail in this document since they are less relevant for Pakistani researchers and organisations.

4.4. ▶ Societal challenges

The EU has identified seven priority challenges where targeted investment in research and innovation can have a real impact benefitting the citizen, in Europe and also in many non-European countries:

- Health, demographic change and wellbeing (Funding: €7.472 billion)
- Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bioeconomy (Funding: €3.851 billion)
- Secure, clean and efficient energy (Funding: €5.931 billion)
- Smart, green and integrated transport (Funding: €6.339 billion)
- Climate action, environment, resource efficiency and raw materials (Funding: €3.081 billion)
- Europe in a changing world - inclusive, innovative and reflective societies (Funding: €1.309 billion)
- Secure societies - protecting freedom and security of Europe and its citizens (Funding: €1.695 billion).

A summary of the 7 core societal challenges can be found in [this short document](#)^{viii}.

4.5. Additional areas

► Spreading excellence and widening participation

Research and innovation are crucial to economic prosperity and so measures are needed to ensure that the innovation performances of all EU Member States and their regions converge and improve. Experience shows that when economic crises constrain national budgets, disparities in innovation performance become more apparent. Exploiting the potential of Europe's talent pool and maximising and spreading the benefits of innovation across the Union is therefore the best way to strengthen Europe's competitiveness and its ability to address societal challenges in the future.

Funding: €816 million

► Science with and for society

Effective cooperation between science and society is needed to recruit new talent for science and to marry scientific excellence with social awareness and responsibility. Horizon 2020 is, therefore, supporting projects that involve citizens in the processes that define the nature of the research that affects their everyday lives. Broader understanding between the specialist and non-specialist communities on objectives and the means for achieving them will maintain scientific excellence and allow society to share ownership of the results.

Funding: €462 million

► Innovation actions in Horizon 2020

Substantial support for innovation is provided throughout Horizon 2020 for prototyping, testing, demonstrating, piloting, large-scale product validation and market replication. Significant support to demand side approaches is another important feature, notably pre-commercial and first-commercial public procurement of innovation, as well as regulation to foster innovation and standard-setting. New forms of public sector innovation and social innovation as well as pilot actions for private sector services and products are also covered.

► Social Sciences and Humanities

As a cross-cutting issue of broad relevance, Social Sciences and Humanities (SSH) research is fully integrated into each of the general objectives of Horizon 2020. Embedding SSH research across Horizon 2020 is essential to maximise the returns to society from investment in science and technology. Integrating the socio-economic dimension into the design, development and implementation of research itself and of new technologies can help find solutions to societal problems.

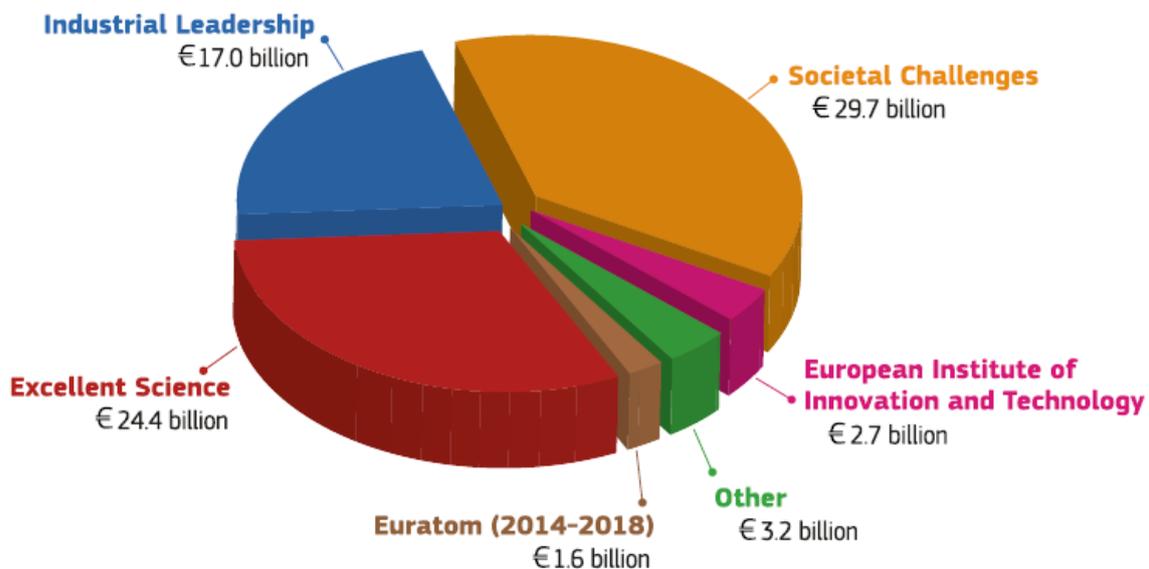
► Nuclear research

EU research on nuclear fission focuses on safety and security, medical research, radiation protection, waste management, industrial uses of radiation, and includes many other areas such as the use of radiation in the agricultural sector.

Research on nuclear fusion aims at demonstrating that fusion can become a viable energy source for large-scale commercial exploitation within a reasonable timeframe, by gathering the efforts of all stakeholders into a unique European joint programme.

Funding: €1.603 billion

The following chart summarises the allocation of funds under 2020:



4.6. International dimension

International participation – A key element of Horizon 2020

In line with the Union's strategy for international cooperation in research and innovation, Horizon 2020 is open to the participation of researchers from across the world. As more research and innovation is performed in international partner countries, it is crucial that Europe be able to collaborate with the best researchers and research centres worldwide. Targeted international cooperation activities are included in the societal challenges, enabling and industrial technologies and other relevant parts of Horizon 2020. The areas and partners for cooperation are identified in the relevant Work Programme.

As many of the EU's international partner countries are investing more and more in research and innovation, cooperation with them will be vital if research is to reach its full potential. An active and more strategic international cooperation will also contribute to achieving wider policy objectives, in particular to addressing societal challenges that most countries outside the EU also have to address.

A new international strategy

In 2012, the European Commission set out its new approach to international cooperation in a Communication entitled "[Enhancing and focusing EU international cooperation in research and innovation: a strategic approach](#)".

In-line with this approach, international cooperation activities developed under Horizon 2020 will contribute to the objectives of:

- Strengthening the Union's excellence and attractiveness in research and innovation and its economic and industrial competitiveness;
- Tackling global societal challenges; and,
- Supporting the Union's external policies.

The new international cooperation strategy focuses on research in areas of common interest and mutual benefit in order to achieve these objectives. To strengthen implementation, the strategy also differentiates between three country groupings:

- Industrialised and emerging economies (which will only receive funding under specific conditions);
- Enlargement and neighbourhood countries (eligible for automatic funding); and

- Developing countries (eligible for automatic funding).

International participation in FP7

Global cooperation was already an important element of FP7. Partner countries accounted for around 5% of total participations; the top international partner countries were Brazil, Russia, India, China, and South Africa (BRICS), Ukraine and the USA. One-in-five projects included an international partner in addition to participants from Member States or Associated Countries (such as Switzerland).

International dimension of the *European Research Council* (ERC^x)

The ERC's mission is to encourage the highest quality research in Europe through competitive funding and to support investigator-initiated frontier research across all fields of research on the basis of scientific excellence. The aim is to recognise the best ideas, and retain and confer status and visibility to the best brains in Europe, while also attracting talent from abroad. Under Horizon 2020, the ERC will continue to play a major role in fostering scientific excellence, building on its success in FP7, and will remain open to non-EU researchers.

***Marie Skłodowska-Curie Actions* to enhance international cooperation (MSCAs^{xi})**

Marie Skłodowska-Curie Actions (MSCAs) promote inter-disciplinary, inter-sectorial and international mobility as well as knowledge-sharing. By attracting non-European researchers, this programme enhances international research cooperation, and facilitates the mobility and exchange of researchers between EU and non-EU universities, research institutions, and private companies. Since their creation in 1996, the MSCAs have helped train over 65 000 fellows of more than 130 nationalities, 30% of them coming from outside Europe. They will be further developed under Horizon 2020 (see below).

4.7. How does Horizon 2020 work concretely ?

Who can apply?

With very few exceptions, organisations and researchers from any country of the world – including Pakistan – can participate in Horizon 2020 projects. However, as explained below, this does not mean that EU funding will be automatically provided to all non-European participants.

The consortium of a typical collaborative project must include 3 independent organisations from different EU member states or associated countries (such as Norway), and may include any number of additional European or non-European organisations.

Who can receive EU funding?

Participants from European countries (EU member states and associated countries) in classical collaborative projects are automatically eligible for funding, as well as those from most developing countries, as defined in [this document](#)^{xii}. However, funding is selective (i.e., not automatic) for participants from developed and emerging countries, as further explained below.

A single funding rate is applicable for all beneficiaries and all activities in a given project, as defined in the Work Programme. The funding rate is up to 100 % of the eligible costs, but is limited to 70 % for innovation projects (with an exception for non-profit organisations - maximum of 100 %).

Information on funding for ERC and MSCA grants can be found in the related sections below.

What types of actions (instruments) are available?

- Research and innovation actions

These are the standard collaborative projects, to which most of the funding will be allocated. They are intended to tackle clearly defined challenges, which can lead to the development of new knowledge or a new technology.

Who? Consortia of partners from different countries, industry and academia.

- Innovation actions

These projects are more focused on closer-to-the-market activities. For example prototyping, testing, demonstrating, piloting, scaling-up, etc. if they aim at producing new or improved products or services.

Who? Consortia of partners from different countries, industry and academia.

- Coordination and support actions

These actions intend to cover the coordination and networking of research and innovation projects, programmes and policies. Funding for research and innovation per se is covered elsewhere.

Who? Single entities or consortia of partners from different countries, industry and academia.

- Frontier research grants – European Research Council

These projects are evaluated on the sole criterion of scientific excellence in any field of research, carried out by a single national or multinational research team led by a ‘principal investigator’.

Who? Excellent young, early-career researchers, already independent researchers and senior research leaders. Researchers can be of any nationality and their projects can be in any field of research.

- Marie Skłodowska-Curie Actions

Funding for international research fellowships in the public or private sector, research training, staff exchanges.

Who? Early-stage researchers or experienced researchers (of any nationality), technical staff, national/regional research mobility programmes.

- The “SME Instrument” and the “Fast track to innovation” schemes are not described in this document.

How to participate?

Work programmes announce the specific research and innovation areas that will be funded. They are accessible through the [Participant Portal](#)^{xiii} and indicate the timing of forthcoming Calls for Proposals. When published, each Call gives more precise information on the research and innovation areas and issues that applicants for funding should address in their proposals.

Although details on all Calls can also be found in the EU’s Official Journal, the Participant Portal goes further. It provides easy-to-follow guidance and all the tools needed to apply for funding and manage projects throughout their lifecycle. It covers every type of research and innovation action.

- **Step 1** - *Find a suitable Call for Proposals*

The Commission publishes all *Calls for Proposals* on the *Participant Portal* of . If you apply for the first time and do not know yet the available programmes, it is useful to refer to the [H2020 Online Manual](#)^{xiv}. It will help you identify the most suitable programme(s) depending on your area and profile, also by using key words and filters if necessary.

- **Step 2** - *Find project partners (or apply as an individual researcher/team)*
 - **Collaborative projects:** Most collaborative projects must include at least 3 independent organisations (legal entities) from different EU Member States or Associated Countries. Various [tools](#)^{xv} help you find potential partners (see below).
 - **Individual researcher or team:** It is also possible to submit your proposal as an individual researcher, team or organisation, especially for *European Research Council* (ERC) grants and *Marie Skłodowska-Curie* actions (MSCAs).
- **Step 3** - *Create an account on the Participant Portal and register your organisation*

To fill in the required forms and submit them electronically to the Commission, you first need to create an account on the Participant Portal. The Commission has an online register of the organisations participating in the EU research and innovation or education, audiovisual and cultural programmes. This allows consistent handling of the organisations' official data and avoids multiple requests for the same information.
- **Step 4** - *Submit your project proposal to the Commission*

The formal (on-line) submission of a project proposal is the responsibility of the coordinator; this means that Pakistani participants (normally not acting as coordinators) do not need to bother about this in classical collaborative projects.
- **Step 5** - *Evaluation by experts*

Once the call is closed, all proposals are evaluated by a panel of independent experts in the field concerned. The panel checks all proposals against a list of [criteria](#)^{xvi} and ranks them.

Should you wish to act as an expert in this context (which is also possible for non-European researchers), please refer to the related section below.
- **Step 6** - *Signature of the Grant Agreement*

Once a proposal passes the evaluation stage and is successfully selected (~ five months' duration), applicants are informed about the outcome. The European Commission then draws up a contract ("grant agreement") with each consortium. The grant agreement accurately defines what research & innovation activities will be undertaken, the project duration, budget, rates and costs, the European Commission's contribution, all rights and obligations and more (e.g. intellectual property provisions). The time limit for signing the grant agreements is generally three months. Once the grant agreement is signed the project can start.

For more information please refer to the [H2020 online manual](#)

4.8. Act as an expert!

The European Commission is looking forward to broadening its pool of experts assisting in the evaluation of proposals and monitoring of actions. A bigger pool of international experts will serve several purposes: to broaden the pool of available expertise (in all domains), to provide the opportunity for an 'outside' perspective to proposal evaluations/ monitoring of actions when necessary, and to provide additional expertise that may be required in the case of actions targeting cooperation with international partner countries.

There are also advantages for international experts:

- They get to know H2020 better, to appreciate the peer-review process and possibly to consider participation in the future;
- They have the opportunity for interaction with European experts in their domain;
- They are remunerated for their work.

Further information (on eligibility, remuneration, workload etc.) and registration details can be found on the [related web page](#)^{xvii}.

4.9. How to find partners?

Seen from Pakistan, it may appear that the identification of potential (European) partners for collaborative projects, and of (European) host institutions for individual researchers, is a complex task. However, many tools are available for this purpose, as summarised on [this page](#)^{xviii}.

In addition to well-known sources of information such as scientific journals, and of opportunities such as scientific conferences, attention should also be paid to:

- patent information (e.g. the free-of-charge [EspaceNet database](#)^{xix} of the *European Patent Office* contains about 80 million documents – watch [video](#)^{xx}), which will enable you to identify the main players in a certain field, at least regarding applied research
- the [CORDIS Partner Service](#)^{xxi}, currently including more than 7000 partner profiles and more than 4000 partnership requests
- the [CORDIS Project Repository](#)^{xxii}, including summaries and lists of participants of most EU Framework Programme projects since 1990
- the [Euraxess Links](#)^{xxiii} assistance service
- *National Contact Points*, where available
- thematic partner search tools – e.g. <http://www.fitforhealth.eu> for health / life sciences.

5. BILATERAL COOPERATION BETWEEN EU MEMBER STATES AND PAKISTAN

This document does not address bilateral cooperation with individual EU member states (MSs). More information on the related instruments can be found on the websites of the respective MSs, as well as in the "[Overview of EU and Member States Research and Innovation Cooperation with India](#)"^{xxiv} (as many schemes described therein are also applicable to Pakistani stakeholders).

6. MORE DETAILS REGARDING THE EUROPEAN RESEARCH COUNCIL (ERC)

ERC grants may be applied for by “principal investigators” (PIs), individually or possibly assisted by “team members”. Vacancies for team members of an ERC project can for instance be published by Principal Investigators (and found by researchers) on the [Euraxess-Jobs](#)^{xxv} portal.

The following table summarises the features of the various ERC grants under H2020, for which researchers of any nationality are eligible:

Core grants	Other ERC grants
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	Starting Grants	Consolidator Grants	Advanced Grants	Synergy Grants	Proof of Concept
For whom?	<p>Researchers with 2-7 years of experience³</p> <p>and scientific track record showing great promise</p>	<p>Researchers with 7-12 years of experience</p>	<p>Researchers of any age. (Applicants must be scientifically independent and be recognised as leaders in their respective field(s).)</p>	<p>Groups made up of 2 to 4 <i>Principal Investigators</i> (PIs) and, as necessary, their teams</p>	<p>PIs benefitting from an on-going or recent⁴ ERC Grant concerning a related research topic</p>
Max. Funding	up to 2 M€	up to 2.75 M€	up to 3.5 M€	15 M€ ⁵	150.000 €
Max. duration	5 years	5 years	5 years	6 years	18 months

Evaluation criteria

For all ERC frontier research grants, excellence is the sole criterion of evaluation. It will be applied to the evaluation of both the research project and the Principal Investigator in conjunction. ERC calls are extremely competitive; only exceptional proposals are likely to be funded and the number of applications has consistently risen faster than the available budget.

Proof of Concept Grants are not ERC frontier research grants and may be evaluated against other evaluation criteria than excellence. The evaluation criteria for selection of proposals for *Proof of Concept Grants* are excellence, impact and quality and efficiency of the implementation.

Procedures

More detailed information can be found on the [ERC web site](#)^{xxvi}, which includes, in particular, a [step-by-step description](#)^{xxvii} of the procedures to be followed before a call for proposals is published, once the call is open, and after the closing date of the call. The [2014 Work Programme](#)^{xxviii} includes detailed information regarding funding rates, eligibility criteria, proposal submission and description, and many other issues.

Typically, a single submission of the full proposal will be followed by a two-step evaluation. The evaluation will be conducted by means of a structure of high-level peer review panels. At step 1, the extended synopsis and the Principal Investigator's track record and CV will be assessed (and not the full scientific proposal). At step 2 the complete version of the retained proposals will be assessed (including the full scientific proposal).

Pakistani participants

It is important for Pakistani applicants to note that Principal Investigators (PIs) may reside in any country in the world. PIs do not have to be based full-time in Europe.

³ since completion of PhD or equivalent degree

⁴ on-going or which has ended less than 12 months before the publication of the *Proof of Concept* call

⁵ for 6 years (pro rata for shorter projects)

However, PIs must spend:

- a minimum 50% of their total working time on the ERC project (this is for Starting and Consolidator Grants – for Advanced Grants the threshold is 30%),
- and also a minimum of 50% of their working time in an EU Member State or Associated Country.

Team members can be located anywhere.

Additional information on ERC grants, specifically targeting researchers from non-European countries, can be found on a [dedicated web page](#)^{xxix}.

Host institutions

The host institution (Applicant Legal Entity) must engage the Principal Investigator for at least the duration of the project, as defined in the grant agreement. It must either be established in an EU Member State or Associated Country as a legal entity created under national law, or it may be an International European Interest Organisation (such as CERN, EMBL, etc.), the European Commission's Joint Research Centre (JRC) or any other entity created under EU law. Any type of legal entity, public or private, including universities, research organisations and undertakings can host Principal Investigators and their teams.

7. MORE DETAILS REGARDING MARIE SKŁODOWSKA-CURIE ACTIONS (MSCAs)

Under H2020, Marie Curie Actions (as they were known under FP7) have been renamed "[Marie Skłodowska-Curie actions](#)"^{xxx} (MSCAs). They come under the "[Excellent Science](#)"^{xxxi} pillar of Horizon 2020 and will award 6,162 million euro over the period 2014-2020.

The objective of MSCAs is to support the career development and training of researchers – with a focus on innovation skills – in all scientific disciplines through worldwide and cross-sector mobility. For this, the MSCA provide grants at all stages of researchers' careers, from PhD candidates to highly experienced researchers, and encourage transnational, intersectoral and interdisciplinary mobility. The MSCA will become the main EU programme for doctoral training, funding 25 000 PhDs.

Endowing researchers with new skills and a wider range of competences, while offering them attractive working conditions, is a crucial aspect of the MSCA. In addition to mobility between countries, the MSCA also seek to break the real and perceived barriers between academic and other sectors, especially business. The MSCA follow a "bottom-up" approach, i.e. individuals and organisations working in any area of research can apply for funding, except for those areas covered by the EURATOM Treaty. Boosting non-academic sector involvement in any of the actions is one of the new features of the MSCA scheme.

There are now 4 types of MSCAs: *ITN*, *IF*, *RISE* and *COFUND*; they are further described below.

7.1. Research networks (ITN): support for Innovative Training Networks

ITNs support competitively selected joint research training and/or doctoral programmes, implemented by partnerships of universities, research institutions, research infrastructures, businesses, SMEs, and other socio-economic actors from different European countries and beyond.

The research training programmes provide experience outside academia, hence developing innovation and employability skills. ITNs will include industrial doctorates, in which non-academic organisations have an equal role to universities in respect of the researcher's time and supervision, and joint doctoral degrees delivered by several universities. Furthermore, non-European organisations can participate as additional partners in ITNs, enabling doctoral-level candidates to gain experience outside Europe during their training either in a European Training Network, in a European Industrial Doctorate, or in a European Joint Doctorate.

7.2. Individual fellowships (IF): support for experienced researchers undertaking mobility between countries, optionally to the non-academic sector

Individual Fellowships will support the mobility of researchers within and beyond Europe - as well as helping to attract the best foreign researchers to work in the EU. The grant usually covers two years' salary, a mobility allowance, research costs and overheads for the host institution. Individual researchers submit proposals for funding in liaison with their planned host organisation. Proposals are judged on their research quality, the researcher's future career prospects, and the support offered by the host organisation. Fellows can also spend part of the fellowship elsewhere in Europe if this would boost impact, and those restarting their career in Europe benefit from special eligibility conditions. Furthermore, Europe-based researchers can be financed to spend a period on another continent, before returning.

7.3. International and inter-sectoral cooperation through the Research and Innovation Staff Exchanges (RISE)

RISE will support the short-term mobility of research and innovation staff at all career levels, from the most junior (post-graduate) to the most senior (management), including also administrative and technical staff supporting the research and innovation activities of the proposal. It will be open to partnerships of universities, research institutions, and non-academic organisations both within and beyond Europe. In worldwide partnerships, academia-to-academia exchanges will be permitted.

This scheme is less relevant to Pakistani researchers since it is only applicable to staff members of organisations located in the EU or associated countries (ACs).

7.4. Co-funding of regional, national and international programmes that finance fellowships involving mobility to or from another country (COFUND)

The MSCA offer additional funding to regional, national and international programmes based in Europe for research training and career development. COFUND programmes encourage the movement of researchers across borders and provide good working conditions. The scheme can support doctoral and fellowship programmes.

This scheme is also potentially relevant to Pakistani researchers, to the extent that the national schemes concerned are open to them.

7.5. Other relevant actions

In addition, there are several Coordination and Support Actions to support the four main actions, such as European Researchers' Night. This is a Europe-wide public event to enhance researchers' public recognition, and to stimulate interest in research careers, especially amongst young people. Pakistani MSC fellows settled in Europe are encouraged to participate in a NIGHT event in their host beneficiary country with an outreach activity. It should be highlighted that a feature of the MSCA is ensuring excellent and innovative research training. Communication and transferable skills such as planning suitable public outreach activities are a key factor.

7.6. Practical information

The [MSCA Work Programme 2014](#)^{xxxii} includes information regarding not only the calls for proposals to be published but also more general issues, such as eligibility conditions, award criteria (excellence/impact/implementation), evaluation procedures and [financial contribution](#)^{xxxiii}. A separate document describes the [MSCA Standard Eligibility Conditions](#)^{xxxiv}.

Early-stage researchers shall at the time of recruitment (ITN, COFUND) or secondment (RISE) by the host organisation, be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a doctoral degree.

Experienced researchers shall, at the time of the relevant deadline for submission of proposals (IF), recruitment (COFUND) or secondment (RISE) by the host organisation, be in possession of a doctoral degree or have at least four years of full-time equivalent research experience.

Individual **Pakistani researchers** are eligible for participation and funding in most MSCA schemes (see table below). Indeed, the general rule is that researchers eligible for MSCAs may be of any nationality, and will receive support on the condition that they move from one country to another to broaden or deepen their competences.

The table below summarises the main features of the various MSCA schemes:

Action	ITN Innovative Training Networks	IF Individual Fellowships	RISE Research and Innovation Staff Exchange	CO-FUND Co-Funding of Regional, National and International Programmes
Who applies ?	Host applies	Individuals apply	Host applies	Funder applies
What does it offer?	High-quality research training delivered through international and interdisciplinary networks, industrial doctorates or joint doctorates	Opportunities to work on personal research projects by moving between countries and possibly sectors to acquire new skills	International and/or intersectoral exchanges of staff members involved in R&I to develop collaborative projects and transfer knowledge	Access to regional, national or international programmes to foster excellence in researchers' training, mobility and career development
Who is it	Networks of organisations that	Postdoctoral researchers (PhD or at	Partnerships of organisations that	Organisations funding or managing doctoral

for?	train researchers at doctoral level (less than 4 years of full-time research experience and no PhD)	least 4 years of full-time research experience)	undertake a joint research project supported by the exchange of their staff (including technical, admin. and managerial staff)	programmes or fellowship programmes
Max. duration	3 months - 3 years	<i>IF European:</i> 12-24 months <i>IF Global:</i> 12-24 months for the outgoing phase, plus a 12-month return phase in Europe	1-12 months	At least 3 months
Funding of individual Pakistani researchers	Yes	Yes, but, in respect of "European Fellowships Reintegration Panels" and of "Global Fellowships", only if the researcher is a long-term resident of the EU/ACs (at least 5 consecutive years of full-time research activity)	Yes, but only if the researchers are staff members of organisations located in the EU or ACs	Yes, depending on the eligibility criteria of the co-funded programmes
Mobility conditions	At the time of recruitment by the host beneficiary, researchers must not have resided, worked, studied, etc. in the country of the host beneficiary for more than 12 months in the 3 years immediately prior to the reference date.	By the proposal submission deadline, researchers must not have resided in the country of the host organisation for more than 12 months in the last 3 years. For <i>Career Restart</i> and <i>Reintegration Panels</i> , the maximum period is 36 m. in the last 5 years. There are additional conditions for the <i>Reintegration Panel</i> (mobility to Europe) and <i>Global Fellowships</i> (mobility from Europe).	Secondments may be split into several stays not exceeding 12 months in total and not going beyond the project duration. The exchanged staff members should be guaranteed full reintegration into the sending institution.	Mobility types supported by fellowship programmes may be similar to the ones supported under the MSCA Individual Fellowships.

8. HIGHER EDUCATION IN THE EU – ERASMUS+ PROGRAMME

Erasmus+, the new EU programme for education, training, youth and sport, launched in January 2014, will offer opportunities for 4 million people to study, train, teach or volunteer abroad by 2020.

Erasmus+ will offer **scholarships** for students, doctoral candidates and staff, and therefore will continue the objectives of Erasmus Mundus.

It will also fund capacity-building projects involving higher education institutions from all over the world including Pakistan, similar to the Asia-Link programme which ran from 2002 to 2007.

Erasmus+ offers a number of opportunities for cooperation with higher education institutions outside the EU, including:

- ***Joint master degree programmes***

Your university can be part of a consortium of higher education institutions that offers a Joint Master Degree programme. These high-level programmes are selected by the European Commission under annual Calls for Proposals. All consortium members design and offer the programme together, and students will study or research in at least two of the institutions. Your institution will therefore be involved in delivering the courses and selecting and hosting the students. The consortium awards a joint or double/multiple degree at the end of the studies. Students apply directly to the consortium, which carries out a competitive selection procedure for EU-funded scholarship places.

- ***Higher education inter-institutional agreements for credit mobility***

Under an inter-institutional agreement your university will be able to send your own students, doctoral candidates or staff (with scholarships) for short-term mobility (up to 12 months) to partner universities covered by the agreement. Under the agreement your institution will recognise the credits accrued by your students when abroad, which will contribute to the student's degree once back home. Your staff will be able to receive grants for teaching assignments or training at the partner institution. Under the same agreement, you will be able to host foreign students, PhD candidates or staff for similar short-term study periods at your institution.

- ***Capacity-building projects***

Your university can take part in collaborative capacity-building projects set up and managed by a consortium of universities from the programme countries* on the one hand and those from a particular region of the world on the other (the EU's neighbouring countries, candidate and potential candidate countries, Latin America, Asia, Africa-Caribbean-Pacific countries). These projects can be:

- Joint projects: these help all partners to develop, modernise and disseminate new curricula, teaching methods or materials, as well as to boost quality assurance and governance of higher education institutions.
- Structural Projects: to develop and reform higher education institutions and systems; to enhance their quality and relevance, promote regional cooperation and increase convergence.

- ***Jean Monnet projects***

Your university can propose a project specialised in EU studies to promote excellence in teaching and research on the European integration process. The Jean Monnet programme supports these projects and the professors, while key activities include courses, research, conferences, and publications in the field of EU studies.

To learn more about Erasmus+ and studying in the EU, visit the [related web site](#)^{xxxv} of the European Commission, where you can find in particular a very detailed [Programme Guide](#)^{xxxvi}, as well as a page specifically focusing on [cooperation outside the EU](#)^{xxxvii}.

9. R&I-RELATED PITFALLS FOR PAKISTANI ORGANISATIONS

Some FP7 applicants or participants from non-EU countries have pointed to issues that hinder or prevent the satisfactory conclusion of contract negotiations. In many cases these are perceived or actual pitfalls that prevent such entities from signing a FP7 grant agreement.

9.1. Visas

ISSUE

Obtaining a visa may be difficult, both for European researchers intending to travel to Pakistan and for Pakistani researchers intending to travel to Europe.

COMMENTS

Regarding **European visas**, rules are also different for each EU member state, although some common principles do apply, especially in the countries member of the "Schengen Area"^{xxxviii} and also as a consequence of the European Directives on the "Scientific Visa Package"^{xxxix} and on the "Blue Card"^{xl} for highly-skilled workers.

The EURAXESS Service Centres^{xli} provide advice and support to researchers and their families moving to Europe, including on visa formalities.

9.2. Intellectual property issues

ISSUE

The IPR rules in Pakistan and in the EU are not exactly identical, which may complicate the management of IPR issues in R&I collaborations.

Moreover, some participants find it difficult to understand and/or apply those IPR rules which specifically apply to the EU Framework Programmes.

COMMENTS

- ***Guidance on the IPR rules applicable in EU Framework Programmes***

The IPR rules applicable in FP7 were explained in a detailed guide^{xlii}. While many of these explanations remain valid, a new similar guide should be available soon for H2020.

One of the main IPR issues to be clarified in any R&I collaboration relates to the ownership of the results. Under Horizon 2020, the basic rule is that each participant owns the results (and related IP, if any) that it has generated (with joint ownership being possible, the case being).

- ***IPR-related assistance***

IPR-related information and free-of-charge assistance can be obtained from the (European) IPR Helpdesk^{xliii}. It has developed various information material, such as this document^{xliv} on IP management in Horizon 2020 at the proposal stage.

- ***Management of IPR issues in international R&I collaborations***

Useful recommendations can be found in the "European Research Area guidelines on intellectual property (IP) management in international research collaboration agreements between European and non-European partners"^{xlv}, which build on the earlier Commission

Recommendation on the management of intellectual property in knowledge transfer activities and Code of Practice for universities and other public research organisations^{xlvi} (which didn't have a specific international focus).

Although somewhat older, the Commission-funded "*Expert group report on role and strategic use of IPR in international research collaborations*"^{xlvii} also provided a number of valuable recommendations. Another Commission-funded expert group delivered a report on "*International knowledge transfer – Investigations of European Practices*"^{xlviii} which provides detailed case studies (and related lessons) involving several European and non-European countries.

9.3. General assistance regarding Horizon 2020

If you have questions about any aspect of European research in general and the EU Research Framework Programmes in particular, please send them to the [Horizon 2020 Helpdesk](#)^{xlix}.



End notes

You can find below the explicit URLs of the links included in the text of this document.

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- i http://europa.eu/about-eu/index_en.htm
 - ii http://ec.europa.eu/research/innovation-union/pdf/competitiveness_report_2013.pdf
 - iii http://ec.europa.eu/research/era/pdf/era_progress_report2013/era_facts_and_figures_new.pdf
 - iv http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014_en.pdf
 - v http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard-2013_sti_scoreboard-2013-en
 - vi <http://ec.europa.eu/programmes/horizon2020/>
 - vii http://ec.europa.eu/information_society/newsroom/cf/horizon2020/document.cfm?action=display&doc_id=4752
 - viii <http://cascade-inconet.eu/sites/default/files/Information%20Sheet.pdf#page=2>
 - ix http://ec.europa.eu/research/iscp/pdf/policy/com_2012_497_communication_from_commission_to_inst_en.pdf
 - x http://erc.europa.eu/sites/default/files/publication/files/ERC_Grant_Schemes_2014_0.pdf
 - xi <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/marie-sklodowska-curie-actions>
 - xii http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-a-countries-rules_en.pdf
 - xiii <http://bit.ly/H2020PP>
 - xiv <http://ec.europa.eu/research/participants/portal/desktop/en/funding/index.html>
 - xv http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/applying-for-funding/find-partners_en.htm
 - xvi http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-ga_en.pdf#page=28
 - xvii <http://ec.europa.eu/research/participants/portal/desktop/en/experts/index.html>
 - xviii http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/applying-for-funding/find-partners_en.htm
 - xix <http://worldwide.espacenet.com>
 - xx <http://www.youtube.com/watch?v=U-2PDaUrADk>
 - xxi <https://cordis.europa.eu/partners/web/guest/home>
 - xxii http://cordis.europa.eu/projects/home_en.html
 - xxiii <http://ec.europa.eu/euraxess/index.cfm/links/index>
 - xxiv http://eeas.europa.eu/delegations/india/documents/snt_update_26_oct_12/overview_of_research_and_innovation_coop_july_2012.pdf
 - xxv <http://ec.europa.eu/euraxess/index.cfm/jobs/index>
 - xxvi <http://erc.europa.eu/funding-schemes>
 - xxvii <http://erc.europa.eu/step-step>
 - xxviii http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/erc/h2020-wp1415-erc_en.pdf
 - xxix <http://erc.europa.eu/non-european-researchers>
 - xxx <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/marie-sklodowska-curie-actions>
 - xxxi <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/excellent-science>
 - xxxii http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-msca_en.pdf#page=39

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- xxxiv http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/msca/h2020-wp1415-msca-elig_en.pdf
- xxxv http://ec.europa.eu/programmes/erasmus-plus/index_en.htm
- xxxvi http://ec.europa.eu/programmes/erasmus-plus/documents/erasmus-plus-programme-guide_en.pdf
- xxxvii http://ec.europa.eu/education/opportunities/higher-education/international-cooperation_en.htm
- xxxviii <http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/borders-and-visas/schengen/>
- xxxix
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- xlii http://ec.europa.eu/research/participants/data/ref/fp7/89593/ipr_en.pdf
- xliii <https://www.iprhelpdesk.eu/>
- xliv
http://www.iprhelpdesk.eu/sites/default/files/newsdocuments/IP%20Management%20in%20Horizon%2020_the%20proposal%20stage_0.pdf
- xlv http://ec.europa.eu/research/innovation-union/pdf/international_cooperation_guidelines_era_ct_group.pdf#view=fit&pagemode=none
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- xlx <http://ec.europa.eu/research/index.cfm?pg=enquiries>