



**Indo-European  
Research & Innovation cooperation under**

**HORIZON 2020**

***the European Union's Framework Programme  
for Research & Innovation (2014-2020)***

**and under other schemes**

**A guide for Indian users**



06.04.2016



**This document is still under development and review.**

**Updated versions of this document will be regularly uploaded on the EU Delegation's web site:**

[http://eeas.europa.eu/delegations/india/eu\\_india/research\\_innovation/index\\_en.htm](http://eeas.europa.eu/delegations/india/eu_india/research_innovation/index_en.htm)

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 their convenience (and in case some of the links are not clickable), the explicit URLs of these websites are provided as end notes.

This brochure was prepared by the *Research & Innovation Section* of the *EU Delegation to India, Delhi*.

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](#)<sup>i</sup>.

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

## 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*<sup>ii</sup>, in a [recent brochure](#)<sup>iii</sup> (2013) on the *European Research Area*, in the "*Innovation Union Scoreboard 2014*"<sup>iv</sup> and in the report on the "*State of the Innovation Union – Taking stock 2010-2014*"<sup>v</sup>.

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 worldwide expenditure on research, 32% of high impact publications and 32% of triadic patent applications, while representing only 7% of the world's population.

Many unique research infrastructures are also located in the EU, such as [CERN](#)<sup>vi</sup>, or those regrouped within the *Association of European-level Research Infrastructure Facilities (ERF-AISBL)*<sup>vii</sup>. In addition, [ESFRI](#)<sup>viii</sup>, the *European Strategy Forum on Research Infrastructures*, is a strategic instrument to develop the scientific integration of Europe and strengthen its international outreach. You should also look at this [interactive map](#)<sup>ix</sup> of European research infrastructures.

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 research intensity target of 3 % by 2020. The EU also remains a very attractive location for R&I investment:

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<sup>1</sup> 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.

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\** also reveals very positive trends regarding EU investment in R&D between 2007 and 2011, both in the public and private sectors.

Apart from these data, there are several reasons why R&I collaborations between India and the EU make sense.

First of all, such collaborations are already quite strong today.

Regarding academic collaboration in particular, the EU is India's leading partner. Indeed, based on an [analysis](#)<sup>xi</sup> of co-publications for the period 2006-10 (covering US, AU, JP, KR, CA, CN, DE, GB, FR and IT), while the USA is by far the leading single country (with 33 % of the total number of India's international co-publications), an aggregation of the data for DE, GB, FR and IT shows that these 4 EU countries alone, when taken together, are already ahead of the USA, with 36 % of the co-publications concerned (implying that the EU as a whole is even more clearly leading). Other indicators, ranging from the number of Nobel Prize winners to the number of international patent applications filed every year, as well as the availability of world-class research infrastructures, are also very favourable to Europe.

The strength of Indo-European R&I collaboration is also apparent from figures relating to the participation of Indian organisations in the previous EU Framework Programme (FP7) and in bilateral programmes of EU member states, as shown in [this overview](#)<sup>xii</sup> and as summarised below in the respective sections of this guide.

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 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 INDIAN RESEARCH ORGANISATIONS AND INDIVIDUAL RESEARCHERS**

This short chapter provides a compact overview of the schemes which are the most relevant for Indian stakeholders, either under Horizon 2020 (the new EU research & innovation framework programme – "H2020" in short) or in other contexts.

#### **3.1. Collaborative research**

- Classical collaborative projects under HORIZON 2020 (resulting from "open calls for proposals")
- Collaborative projects resulting from calls for proposals launched by the multilateral INNO INDIGO funding platform (or another ERA-Net project, e.g. INFECT-ERA)
- Collaborative projects resulting from calls for proposals launched by specific EU member states (bilateral cooperation).

## 3.2. Opportunities for individual researchers / students

- *Marie Skłodowska-Curie Actions* (MSCAs) fellowships under H2020
- ERC grants (*European Research Council*) under H2020
- Evaluation experts for H2020
- *Erasmus+* scholarships (especially for Masters' students)
- Mobility fellowships bilaterally offered by specific EU member states.

A convenient [flyer](#)<sup>xiii</sup> summarises the MSCA, ERC and Erasmus+ schemes.

# 4. HORIZON 2020

## 4.1. Introduction

Horizon 2020<sup>xiv</sup>, the EU's new Framework Programme for Research and Innovation (R&I), 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 many types of activities, from frontier science to close-to-market innovation.

Horizon 2020 brings all EU-level funding for research and innovation under one roof<sup>2</sup>, 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](#)"<sup>xv</sup> 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.

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

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

Some of today's most significant advances in science 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.

*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.

#### **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. EU funding helps pool resources for such large-scale projects, and provides Europe's researchers with access to the very latest, state-of-the-art infrastructure – making new and exciting research possible.

### **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.

#### **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 Indian 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](#)<sup>xvi</sup>.

## 4.5. Additional areas

### ▶ 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.

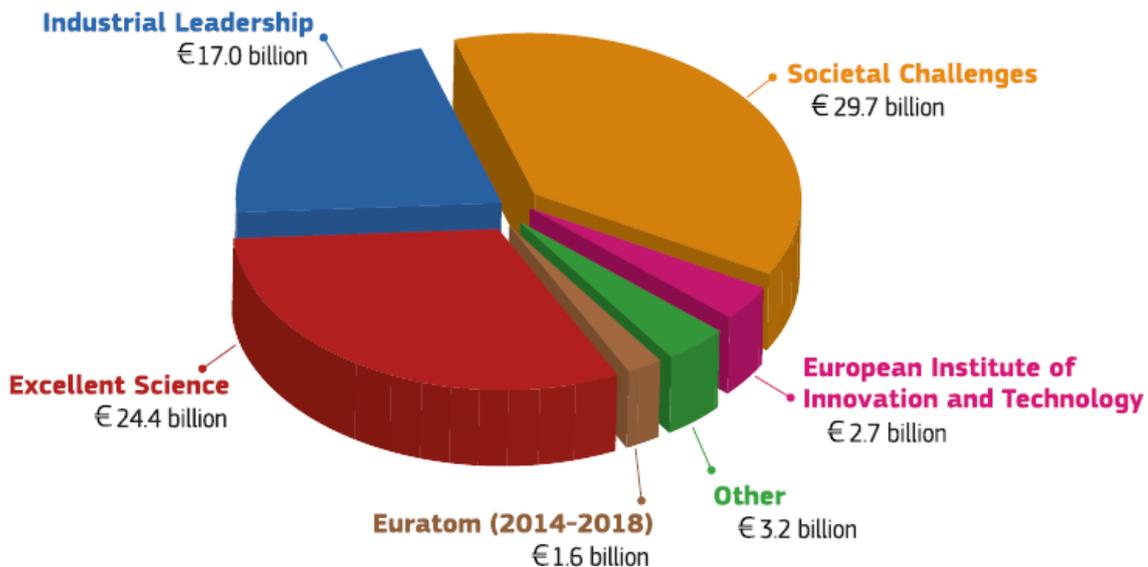
### ▶ Nuclear research

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 European stakeholders.

*Funding: €1.603 billion*

The following chart summarises the allocation of funds under Horizon 2020:



## 4.6. International dimension

### International participation – A key element of Horizon 2020

In line with the European 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.

As many of the EU's international partner countries are investing more and more in research and innovation – and this is clearly the case in India –, cooperation with them will be vital if research & innovation 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 not only the EU but also most countries outside the EU 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*"<sup>xvii</sup>.

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

- strengthening the EU's excellence and attractiveness in research and innovation and its economic and industrial competitiveness;
- tackling global societal challenges; and,
- supporting the EU's external policies.

The new international cooperation strategy focuses on R&I in areas of common interest and mutual benefit in order to achieve these objectives. The strategy also differentiates between three country groupings, in terms of funding rules<sup>xviii</sup>:

- Industrialised and emerging economies (such as India) (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 (2007-13)**

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<sup>xi</sup> (such as Norway). Indian participation in FP7 was quite strong, as explained below.

### **International dimension of the *European Research Council (ERC)*<sup>xx</sup>**

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)*<sup>xxi</sup>**

*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 European<sup>3</sup> and non-European 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).

This fact sheet<sup>xxii</sup> provides figures regarding the 1638 Indian researchers funded in *Marie Curie Actions* (MCAs) under FP7 (2007-13).

## **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 India – can participate in Horizon 2020 projects. However, this does not mean that EU funding will be automatically provided to all non-European participants (see below).

The consortium of a typical collaborative project must include 3 independent organisations from different EU member states ("MSs") or associated countries<sup>xxiii</sup> (such as Norway), and beyond this may include any number of additional EU or non-EU organisations. Organisations from both the public and private sectors are eligible for participation.

### **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<sup>xxiv</sup>. However, funding has become "selective" (i.e., not automatic) for participants from emerging countries, including India, as further explained below.

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<sup>3</sup> In this context, "European" means from a EU member state or a country associated to Horizon 2020

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 Actions (with an exception for non-profit organisations – funding up to 100 %).

Information on funding for ERC and MSCA grants can be found in the related sections below – where it is clarified that, under such schemes, funding is still available for individual Indian researchers.

### **What types of actions (instruments) are available ?**

- [Research and Innovation Actions \(RIAs\)](#)

These are the classical collaborative projects, which are the most important tool in Horizon 2020. They are intended to tackle clearly defined challenges, which can lead to the development of new knowledge or a new technology. Such actions typically include a dozen of participants, may have a budget of several million euros, and their typical duration may be e.g. 4 years.

Who? Consortia of partners from different countries, industry and academia – including at least 3 partners from 3 different EU member states or countries associated to Horizon 2020.

- [Innovation Actions \(IAs\)](#)

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? Same rules as for RIAs (see above).

- [Coordination and support actions \(CSAs\)](#)

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 \(ERC\)](#)

These projects are evaluated on the sole criterion of scientific excellence in any field of research, carried out by carried out by a 'Principal Investigator' ('PI') and his/her research team.

Who? Top early-career researchers, already independent researchers and senior research leaders. Researchers (PIs and team members) can be of any nationality and their projects can be in any field of research.

- [Marie Skłodowska-Curie Actions \(MSCAs\)](#)

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 as they are less relevant for Indian participants.

Detailed information on the various typed of action is available [here](#)<sup>xxv</sup>.

For a full description of all components of Horizon 2020, please refer to [this webpage](#)<sup>xxvi</sup>.

A glossary explaining most of the [reference terms](#)<sup>xxvii</sup> is also available – see "Glossary" chapter below.

## How to participate ?

The Work Programme ("WP" – sub-divided in several chapters) announces the specific R&I areas that will be funded, two years by two years. The WP 2016-2017 is accessible through the [Participant Portal](#)<sup>xxxviii</sup> and indicates the topics and timing of Calls for Proposals to be published during the two years concerned. When published, each Call gives more precise information on the research & 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 European Commission publishes all *Calls for Proposals* on the *Participant Portal*. If you apply for the first time and do not know yet the available opportunities/instruments, it is useful to refer to the [H2020 Online Manual](#)<sup>xxxix</sup>. It will help you identify the most suitable opportunity/instrument depending on your area and profile, also by using keywords 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 3 different EU Member States or Associated Countries. Various [tools](#)<sup>xxx</sup> 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). For these schemes, however, the researcher must first identify a suitable host institution in the EU, that accepts to host him/her for a specific project.

- **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 European 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 also education, audiovisual and cultural) programmes. This allows consistent handling of the organisations' official data and avoids multiple requests for the same information.

If you want to participate in a project proposal, your organisation needs to be registered and have a 9-digit "Participant Identification Code" (PIC) that is the unique identifier of your organisation and will be used as a reference by the Commission in any interactions. See the [Guide on beneficiary registration, validation and financial viability check](#).

- **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 Indian participants (rarely acting as coordinators, although this is possible) do not need to bother about this in classical collaborative projects. See the section on [section on Proposal submission and evaluation](#)<sup>xxxi</sup> of the Grants Manual, as well as the helpful ["self-evaluation forms"](#)<sup>xxxii</sup> that are available for *Research and innovation actions*, for *Innovation actions* and for *Coordination & support actions*.

Note that there are one-stage and two-stage submission schemes. For two-stage submission schemes, you must submit a 'short outline proposal' for the first stage and you will be invited to submit your 'full proposal' for the second stage, if you pass the first-stage evaluation.

This [template](#)<sup>xxxiii</sup> summarises which information has to be provided for a *Research & Innovation Action* (RIA). (For other types of actions, please see the section on "Templates & forms / Proposal templates" in the [list of reference documents](#)<sup>xxxiv</sup>.) This information

has to be submitted on-line by the coordinator, using the electronic submission system of the Participant Portal (this is not about filling in a template and sending it back, as it was in the past), as described in the related [manual](#)<sup>xxxv</sup>.

- **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](#)<sup>xxxvi</sup> and ranks them.

Should you wish to act as an expert in this context (which is also possible for non-European researchers, including Indian ones), 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" – 'GA') with each consortium. The GA 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 GA is generally three months. Once the GA is signed the project can start.

Normally the GA is governed by the applicable EU law, supplemented if necessary by the law of Belgium. If a dispute concerning the interpretation, application or validity of the GA cannot be settled amicably, the General Court — or, on appeal, the Court of Justice of the European Union — has sole jurisdiction.

An [annotated Grant Agreement](#)<sup>xxxvii</sup> is available for collaborative projects; it includes abundant detailed information and examples, relating in particular to financial aspects.

- **Step 7 – Implementation of the project**

During this phase all provisions of the grant agreement need to be taken into account, including those relating to deliverables<sup>4</sup> & reporting, and to financial issues.

While all beneficiaries (partners/contractors) are jointly and severally liable for the technical implementation of the project, the coordinator plays a special role, regarding in particular:

- reporting: it is the coordinator who must submit to the Commission or Agency the technical and financial reports (periodic and final), after reviewing and compiling the individual contributions from each beneficiary; and
- payments, that will also be made to the coordinator (typically, one pre-financing payment, one or more interim payments, and one payment of the balance) on the basis of his/her requests for payment. The coordinator must distribute the payments between the beneficiaries without unjustified delay.

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

## 4.8. Special issues relevant for Indian participants, including funding options (NEW)

- **Thematic focus relevant for Indian participants**

While Indian participants are welcome to collaborate with European organisations in any of the fields covered by Horizon 2020, the following fields have been defined as key

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<sup>4</sup> 'Deliverables' are additional outputs (e.g. information, special report, a technical diagram brochure, list, a software milestone or other building block of the project) that must be produced at a given moment during the action (normally not at the same time as the periodic/final reports).

priorities: health, water, energy and the bio-economy. These priorities have been jointly agreed by the European Commission, EU member states and India. It may be noted that, under FP7 already, **health** was by far (in terms of funding) the area where Indian entities collaborated the most with Europe.

- **Funding by the EU of Indian participants under Horizon 2020**

The (new) basic rule is that EU funding will normally **not** be available for participants from emerging countries (including India) in respect of classical **collaborative research projects** (“research & innovation actions”). For such participants, EU funding will however be available when their participation is deemed by the European Commission to be essential in the project (and some Indian participants have already enjoyed this exception under Horizon 2020).

Moreover, individual Indian researchers are still eligible for participation *and for EU funding* under **ERC grants** and **MSCAs** (*Marie Skłodowska-Curie Actions*).

Funding will also be available for Indian entities involved in a collaborative project relying on one of the India-specific mechanisms described below (e.g. plurilateral funding under INNO INDIGO or other ERA-Nets or JPIs). Therefore it would be wrong to consider that no funding is available anymore to support Indian participants in Horizon 2020.

- **Funding by India of Indian participants under Horizon 2020** \*\*\* NEW \*\*\*

While in general no EU funding is available for Indian participants in collaborative projects, co-funding may be offered by Indian authorities, on a case-by-case basis, under conditions to be defined by them.

Since March 2016, such **co-funding is now available from DBT in certain cases**. Indeed, an agreement has been reached between the European Commission and DBT, according to which DBT may agree (subject to its positive evaluation) to fund Indian participants in Horizon 2020 projects resulting from the following calls for proposals:

<b>Call name / topic</b> <i>(click topic name to follow link)</i>	<b>Planned Opening date</b>	<b>Planned Closing date</b>
<a href="#">NMBP-15-2017</a> : Nanotechnologies for imaging cellular transplants and regenerative processes in vivo - <i>Bio-Nano-Tech</i>	11.5.2016	27.10.2016
<a href="#">BIOTEC-07-2017</a> : New Plant Breeding Techniques (NPBT) in molecular farming: Multipurpose crops for industrial bioproducts - <i>Biotech</i>	11.5.2016	27.10.2016
<a href="#">SC1-PM-07-2017</a> : Promoting mental health and well-being in the young - <i>Health</i>	29.7.2016	4.10.2016
<a href="#">SC1-PM-08-2017</a> : New therapies for rare diseases - <i>Health</i>	29.7.2016	4.10.2016
<a href="#">SC1-PM-10-2017</a> : Comparing the effectiveness of existing healthcare interventions in the adult population - <i>Health</i>	29.7.2016	4.10.2016
<a href="#">LCE-06-2017</a> : New knowledge and technologies - <i>Secure, Clean and Efficient Energy</i>	20.9.2016	5.1.2017
<a href="#">SFS-10-2017</a> : Research and approaches for emerging diseases in plants and terrestrial livestock - <i>Biotech</i>	4.10.2016	14.2.2017

Call name / topic (click topic name to follow link)	Planned Opening date	Planned Closing date
<a href="#">SFS-13-2017</a> : Validation of diagnostic tools for animal and plant health - <i>Biotech</i>	4.10.2016	14.2.2017
<a href="#">SFS-16-2017</a> : Bee health and sustainable pollination - <i>Biotech</i>	4.10.2016	14.2.2017
<a href="#">SFS-17-2017</a> : Innovations in plant protection - <i>Biotech</i>	4.10.2016	14.2.2017
<a href="#">SFS-22-2017</a> : Smart fisheries technologies for an efficient, compliant and environmentally friendly fishing sector - <i>Marine-Biotech</i>	4.10.2016	14.2.2017
<a href="#">SFS-34-2017</a> : Innovative agri-food chains: unlocking the potential for competitiveness and sustainability - <i>Biotech</i>	4.10.2016	14.2.2017
<a href="#">SFS-35-2017</a> : Innovative solutions for sustainable food packaging - <i>Biotech</i>	4.10.2016	14.2.2017
<a href="#">BG-08-2017</a> : Innovative sustainable solutions for improving the safety and dietary properties of seafood - <i>Marine-Biotech</i>	4.10.2016	14.2.2017
<a href="#">BB-02-2017</a> : Towards a method for the collection of statistical data on bio-based industries and bio-based products - <i>Biotech</i>	4.10.2016	14.2.2017
<a href="#">BB-03-2017</a> : Adaptive tree breeding strategies and tools for forest production systems resilient to climate change and natural disturbances - <i>Biotech</i>	4.10.2016	14.2.2017
<a href="#">SC1-PM-16-2017</a> : In-silico trials for developing and assessing biomedical products - <i>Health</i>	8.11.2016	14.3.2017
<a href="#">SC1-PM-17-2017</a> : Personalised computer models and in-silico systems for well-being - <i>Health</i>	8.11.2016	14.3.2017

As explained in [DBT's notice<sup>xxxviii</sup>](#), the "co-funding mechanism" agreed with DBT will work as follows:

- **Each proposal is submitted** simultaneously **both (1) to DBT** by the Indian participant(s) only, **and (2) to the EC** on behalf of all participants (before the closing date of the H2020 call concerned).
  - **The proposal submitted to the EC** is a classical, complete Horizon 2020 proposal, fulfilling all H2020 requirements (it is thus extremely important that Indian participants as well are fully aware of all related administrative, legal and other aspects). The H2020 proposal has to be submitted on-line by the *project coordinator* – usually this role is played by one of the EU participants, what considerably reduces the administrative burden for Indian participants – on behalf of all participants, **including the Indian ones**.
  - **The proposal submitted to DBT** must include (1) 'Part B' of the H2020 proposal (also called 'technical annex', describing the research work to be conducted) and (2) a 'financial plan', i.e. an Excel table identifying the planned expenditures (in Rupees) for all Indian partners involved. This proposal is submitted to DBT, by email, by one Indian participant (the "*Indian project coordinator*") on behalf of all Indian participants (if there are more than one).
- The proposals are **evaluated** by both the EC and DBT. For proposals positively evaluated by both sides, DBT provides a research grant (funding) to the Indian researchers, while the EU

funds the EU participants (under a "grant agreement" signed by all participants, including the Indian ones), enabling the project to start. In some cases, project participants can be required to sign an additional Consortium Agreement before the start of the project. DBT may allocate a maximum of three crore rupees (₹ 30,000,000, i.e. about 400 k€) per project to successful Indian participants, for a maximum duration of 3 years.

A similar "co-funding mechanism" is currently being negotiated with DST, and ICMR funding is in principle available for ICMR teams to participate in Horizon 2020.

- **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 many 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 website](#)<sup>xxxix</sup>. The [model contract](#)<sup>xl</sup> for experts is also available.

- **Legal aspects**

In the event an Indian research organisation would participate in a Horizon 2020 collaborative project without receiving any EU funding, certain obligations of the Grant Agreement would not apply to that organisation, as stated in [Article 9](#)<sup>xli</sup> of the Model Grant Agreement.

## 4.9. How to find partners ?

Seen from India, it may appear that the identification of potential (European) partners for collaborative projects, and of (European) host institutions for individual researchers, is a very complex task. However, [many tools](#)<sup>xlii</sup> are available for this purpose.

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](#)<sup>xliii</sup> of the *European Patent Office* contains about 80 million documents – watch [video](#)<sup>xliiv</sup>), which will enable you to identify the main players in a certain field, especially regarding applied research
- the [CORDIS Partner Service](#)<sup>xliv</sup>, currently including more than 7000 partner profiles and more than 4000 partnership requests, and the [CORDIS Project Repository](#)<sup>xlvi</sup>, including summaries and lists of participants of most past EU Framework Programme projects
- the [Catalogue of FP7 projects with Indian participants](#)<sup>xlvii</sup>
- the [Euraxess Links](#)<sup>xlviii</sup> assistance service
- [National Contact Points](#)<sup>xlix</sup>

- thematic partner search services – e.g. <http://mm.fitforhealth.eu> for health & life sciences
- the extensive [EURAXESS JOBS<sup>i</sup>](#) service, useful both for individual researchers looking for a job, as well as research organisations looking to hire researchers.

## 5. ADDITIONAL SCHEMES AVAILABLE FOR INDIAN PARTICIPANTS

### 5.1. Bilateral collaboration with EU member states (MSs)

This document does not address bilateral cooperation between India and individual EU member states. More information on the related instruments can be found in the "[Overview of EU and Member States Research and Innovation Cooperation with India<sup>li</sup>](#)" and in the "[Compendium of European Mobility Schemes for Students and Researchers India ↔ Europe<sup>lii</sup>](#)", and evidently on the websites of the (embassies in India of the) respective MSs.

It may be noted that several EU MSs have established joint research centres or similar structures in India, for instance the *Indo-German Science & Technology Centre (IGSTC)*, the *German House for Research and Innovation (DWIH New Delhi<sup>liii</sup>)*, the *Indo-French Centre for the Promotion of Advanced Research (CEFIPRA<sup>liv</sup>)*, the *UK-India Education and Research Initiative (UKIERI<sup>lv</sup>)*, the *Research Councils UK India (RCUK India<sup>lvi</sup>)*, the *Innovation Centre Denmark in India (link<sup>lvii</sup>)* and many others.

In this respect, a study of the *Indian Institute of Management* on "[Foreign R&D Centres in India: An Analysis of their Size, Structure and Implications<sup>lviii</sup>](#)" is particularly interesting.

### 5.2. Coordinated calls by Indian authorities and the EU

In the framework of Horizon 2020, a number of "coordinated calls for proposals" may again be launched jointly by Indian authorities and the European Commission, building on the successful implementation of five such calls during FP7.

### 5.3. Plurilateral funding for R&I – INNO INDIGO, JPIs, etc.

As was successfully the case with [NEW INDIGO<sup>lix</sup>](#) until 2013, the "[INNO INDIGO<sup>lx</sup>](#) Partnership Programme" (an ERA-Net project funded by the European Commission) provides, until 2016/17, a multilateral funding platform through which several EU national funding agencies and Indian authorities fund joint collaborative research projects in various areas.

Each consortium applying for funding under INNO INDIGO must include at least 3 eligible partners from the participating countries (that vary for each call): 2 of which have to come from 2 different European participating countries, and 1 of which has to come from India.

The 3 evaluation criteria are *Scientific excellence and innovativeness*; *Management, Transnationality and Cooperation*; and *Potential impact and expected outcomes*.

INNO INDIGO is implemented with a "virtual common pot" which means that funds for each project are provided directly to successful applicants by the respective national/regional funding agency (that also determine which costs are eligible). The amount of funding per project and per partner depends on national/regional regulations of the respective participating funding organisations. Each project partner is invited to consult its respective national/regional regulations for further details

This is not the only multilateral funding platform; for instance, the EU-funded [Infect-ERA](#)<sup>lxii</sup> (also an ERA-Net) has launched several calls for proposals associating several European funding agencies and also the Indian *Department of Biotechnology*, DBT, that provided funding to Indian participants.

[Joint Programming Initiatives](#)<sup>lxiii</sup> (JPIs), under which several EU member states join forces in specific R&I areas (in order to develop and implement common Strategic Research Agendas addressing major societal challenges), may also be relevant for India as most of them are open to international participation. In June 2015, for instance, India was officially invited to participate in the [Water JPI](#)<sup>lxiii</sup> (a reply is still expected, as of January 2016) and in the [Antimicrobial Resistance JPI](#)<sup>lxiv</sup>.

## 5.4. GITA – Bilateral funding for industrial R&D projects

GITA – the Indian *Global Innovation & Technology Alliance* – is running bilateral industrial R&D [funding programmes](#)<sup>lxv</sup> with several countries including e.g. Spain, Finland and the UK.

## 5.5. Funding by specific European research organisations

A number of European research organisations are running their own research funding programmes, for example the *European Molecular Biology Organization* ([EMBO](#)<sup>lxvi</sup>).

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

ERC grants are offered to “principal investigators” (‘PIs’) and their “team members”. Vacancies for team members of an ERC project can for instance be published by Principal Investigators (and found by interested researchers) on the [EURAXESS-Jobs](#)<sup>lxvii</sup> portal.

The following table summarises the features of the various ERC grants under H2020:

	Core ERC grants			Other ERC grants	
	Starting Grants	Consolidator Grants	Advanced Grants	Synergy Grants	Proof of Concept
For whom ?	<p>Researchers with 2-7 years of experience<sup>5</sup></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 recent<sup>6</sup> 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€ <sup>7</sup>	150.000 €

<sup>5</sup> since completion of PhD or equivalent degree

<sup>6</sup> on-going or which has ended less than 12 months before the publication of the *Proof of Concept* call

<sup>7</sup> for 6 years (pro rata for shorter projects)

<b>Max. duration</b>	5 years	5 years	5 years	6 years	18 months
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## Evaluation criteria

For all ERC "core 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. Guidance can be found in this [self-evaluation form](#)<sup>lxviii</sup> for ERC *Starting Grants* and *Consolidator Grants*.

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

## Procedures

More detailed information can be found on the [ERC web site](#)<sup>lxix</sup>, which includes, in particular, a [step-by-step description](#)<sup>lxx</sup> 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 [2016 Work Programme](#)<sup>lxxi</sup> 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).

[This video](#)<sup>lxxii</sup> clearly explains what is the ERC and how it works step-by-step.

## Indian participants

It is important for Indian 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. However, PIs must spend [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](#)<sup>lxxiii</sup>.

## 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](#)"<sup>lxv</sup> (MSCAs). They come under the "[Excellent Science](#)"<sup>lxvi</sup> pillar of Horizon 2020 and will award 6,162 million euro, over the period 2014-2020, to about 65,000 researchers worldwide. Under FP7, about 1600 Indian researchers were awarded a MCA grant, for a total amount (EU funding) of about 4.5 M.

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, as well as in a convenient [Pocket Guide](#)<sup>lxvii</sup> and in this [flyer](#)<sup>lxviii</sup>.

### 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 and infrastructures, businesses and other socio-economic actors from Europe 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 help 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.

This scheme, and more specifically the "*European Fellowship*" sub-scheme, is **particularly relevant for Indian researchers**. Proposals for *European Fellowships* involve a single host organisation (future "beneficiary") established in a EU MS or AC (see Glossary). The project proposals are submitted by this host organisation, which is represented by the supervisor, in liaison with the researcher. Detailed information about this (sub-)scheme can be found in the *Guide for Applicants*<sup>lxxxviii</sup> relating to the *Individual Fellowships* call for proposals published in Sept. 2015, in *this FAQ*<sup>lxxxix</sup> and in this *self-evaluation form*<sup>lxxx</sup>.

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

RISE will support short-term mobility of research and innovation staff at all career levels, from the most junior (post-graduate) to the most senior (management), including administrative and technical staff supporting the research and innovation activities proposed. It is 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. It should be noted that (as for collaborative projects), Indian organisations will receive EU funding in exceptional cases only.

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

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

This scheme is also potentially relevant to Indian 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. Indian MSCA 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 2016-17*<sup>lxxxix</sup> 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<sup>lxxxii</sup>. Separate documents describe the [MSCA Standard Eligibility Conditions](#)<sup>lxxxiii</sup> and the [MSCA Award Criteria and Evaluation Procedure](#)<sup>lxxxiv</sup>.

*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 **Indian 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.

However, in line with the [new funding rules](#)<sup>lxxxv</sup> (*selective funding*) applicable to entities based in emerging countries, Indian institutions/organisations involved in MSCAs under HORIZON 2020 will not be entitled to automatic EU funding.

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

<i>Action name</i> →	<b>ITN</b> Innovative Training Networks	<b>IF</b> Individual Fellowships	<b>RISE</b> Research and Innovation Staff Exchange	<b>CO-FUND</b> Co-funding of regional, national and international programmes
Who applies?	Host institutions (in Europe)	Individual researchers	Consortia of at least 3 organisations (2 from EU MS/AC + 1 from India is ok)	Funding agencies
How does it work ?	Successful proposals from networks receive funding for up to 4 years to cover researcher allowances as well as the cost of research, training and networking activities.	A proposal is submitted by a researcher in liaison with a host. Successful proposals receive up to 2 years' support.	A joint R&I project is implemented by the exchange of individual staff during 1-12 months.	Selected organisations that fund/manage a doctoral or fellowship programme receive a fixed amount for each supported researcher.
Who is it for?	Networks of organisations that train early-stage researchers at doctoral level (less than 4 years of full-time research experience and no PhD)	Experienced / post-doctoral researchers (PhD or at least 4 years of full-time research experience)	Partnerships of organisations that undertake a joint research project supported by the exchange of staff (including technical, admin. and managerial staff)	Organisations funding or managing doctoral or fellowship programmes
Duration	3 months - 3 years	<i>IF European:</i> 12-24 months	1-12 months	At least 3 months
Funding of individual Indian researchers	Yes	Yes	Yes, <u>IF</u> the researchers are permanent staff members of the institutions included in the consortium	Yes, depending on the eligibility criteria of the co-funded programmes
Mobility	At the time of	By the proposal	Secondments may be	Mobility types

conditions	recruitment by the host, researchers must not have resided, worked, etc. in the country of the host for more than 12 months (in the 3 years immediately prior to the reference date).	submission deadline, researchers must not have resided in the country of the host for more than 12 months in the last 3 years.	split into several stays not exceeding 12 months in total, nor the project duration. The exchanged staff members should be guaranteed full reintegration into the sending institution.	supported by fellowship programmes may be similar to the ones supported under the <i>MSCA Individual Fellowships</i> .
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The following table is also quite helpful to identify which MSCA scheme is best suitable, depending on your experience (lines) and on who applies for the fellowship (columns):

	Host applies	Individuals apply with an organisation	Funder applies
<b>You have less than 4 years research experience</b> (e.g. you are doing your PhD)	ITN RISE		COFUND
<b>You have more than 4 years research experience</b> or you have a PhD	RISE	IF	
<b>Managerial and technical staff</b>			

A [Fact Sheet](#)<sup>lxxxvi</sup> on "IP management in Horizon 2020 Marie Skłodowska-Curie Actions" has been published by the IPR Helpdesk, recalling amongst others that the results of MSCA projects belong to the beneficiary (i.e. usually the host institution, not the researcher).

## 8. BACKGROUND INFORMATION ABOUT EU-INDIA R&I COLLABORATION

EU-India relations regarding research and innovation formally started with the *European Community-India Science and Technology Cooperation Agreement*<sup>lxxxvii</sup> in 2001 (renewed in 2007<sup>lxxxviii</sup> and again in 2016). An *agreement for cooperation in the field of fusion energy research*<sup>lxxxix</sup> was also signed in 2009.

With these agreements as a background, the participation of Indian entities (universities, research centres, companies, etc.) in the EU Framework Programmes has been steadily increasing. In the 7<sup>th</sup> Framework Programme ("FP7"<sup>xc</sup>), for instance, India ranked 4<sup>th</sup> in terms of participation (more than 200 projects included Indian participants), and 3<sup>rd</sup> in total amount of EU financial contribution received (circa 41 M€ went directly to Indian entities).

Quite relevant from a political point of view is also the publication of five "Coordinated Calls for Proposals" organised and funded jointly by the EU and India (30 M€ in total by each side), which led to several projects with strong Indian participation being launched.

Science and technology was one of the key policy areas addressed – with a list of concrete objectives – in the *Joint Action Plan*<sup>xcii</sup> agreed by the EU and India in their Summit of 2005, and *updated in 2008*<sup>xciii</sup>.

The *SFIC*<sup>xciii</sup> (the EU's *Strategic Forum for International Science and Technology Cooperation*), an advisory body to the Council and the Commission, plays since 2008 a key role in coordinating the EU's and its member states' strategy regarding international R&I

collaboration. In particular, in 2010 it launched an "India Pilot Initiative"<sup>xciv</sup> on water and bio-resources challenges, which paved the way for tighter EU/MS/India cooperation.

Several ministerial meetings have taken place since then, so as to review progress and further implement relevant actions. They ultimately led to a Joint Declaration<sup>xcv</sup> being signed at the 2012 EU-India Summit, that paved the way for an ambitious *Euro-Indian Partnership on Research and Innovation*, involving the setting up of a *Group of Senior Officials* (GSO) and the development of a *strategic research and innovation agenda* (SRIA), as defined in the Brussels communique<sup>xcvi</sup> adopted at the May 2012 ministerial meeting. Currently 3 priority areas have been defined for this partnership – health, water and energy –, to which ICT and the bio-economy should be added. The first meeting of the GSO took place in Brussels on 8.10.2013.

These developments take place in a context of increased emphasis on research and innovation in public policies, both in the EU (cf. its "Innovation Union"<sup>xcvii</sup> flagship initiative) and in India (cf. its "*Decade of Innovation*" initiative and its "Science, technology and innovation policy 2013"<sup>xcviii</sup>).

More information on the EU's policy regarding international research and innovation collaboration can be found in a recent Commission Communication "*Enhancing and Focussing EU International Cooperation in Research and Innovation: A Strategic Approach*" (COM(2012)497<sup>xcix</sup> – SWD(2012)258<sup>c</sup>).

Obviously, EU initiatives focusing on India complement the numerous bilateral activities that several EU member states have implemented. In particular, the above-mentioned Partnership on research and innovation (currently being set up) benefits from a strong involvement of EU member states (MS). More information on EU and MS R&I schemes is available in the "Overview of EU and Member States Research and Innovation Cooperation with India"<sup>ci</sup>.

It is also important to note that India is a valuable partner for the EU in major international projects such as the *European Organization for Nuclear Research*, CERN (e.g. it contributed since 1996 to the *Large Hadron Collider*), or the *International Thermonuclear Experimental Reactor* (ITER). Furthermore India's *National Knowledge Network* (NKN) is linked to its pan-European equivalent GEANT, and is part of the *Trans-Eurasia Information Network* (TEIN), which is supported by the EU.

In addition to a number of collaboration opportunities offered at a bilateral level by several EU member states, the EU itself (more specifically the European Commission) runs various large-scale research and innovation activities in which Indian participation is encouraged, in particular the EU Framework Programmes for research ("FPs").

Under FP7 for instance (2007-13), about 200 Indian entities participated in collaborative R&D projects (see catalogue<sup>cii</sup>), receiving about 41 M€ of EU funding. Moreover, more than 1600 Indian researchers enjoyed Marie Curie fellowships<sup>ciii</sup> (promoting mobility and training of researchers).

Still under FP7, 173 Indian nationals have also applied for an ERC<sup>civ</sup> grant, of which 18 have received one.

Since the start of the ERASMUS MUNDUS programme<sup>cv</sup> in 2004, approx. 2500 Indians – either PhD or Master's students – have been selected for Erasmus Mundus scholarships. The new ERASMUS+ programme<sup>cvi</sup> remains relevant for Master's students, while PhD students are now covered by MSCAs.

Calls for proposals specifically targeting India have also been launched by the NEW INDIGO Partnership Programme<sup>cvi</sup>, which supports Indo-European multilateral research and networking projects, and is funded both by EU member states and by India (DST, DBT). By the end of 2013 four multilateral calls for proposals had been published, and NEW INDIGO

was then replaced by [INNO INDIGO<sup>cviii</sup>](#). After the termination of INNO INDIGO in 2017, it is expected that its *Platform for Funders* will keep operating, under the control of the national funding agencies interested.

Finally, it may be noted that the EU is the region of the world with which Indian researchers are collaborating the most, as assessed on the basis of joint academic publications, as mentioned above.

## 9. CASE STUDIES / SUCCESS STORIES REGARDING EU-INDIA R&I COLLABORATION

### 9.1. Collaborative projects

Success stories relating to FP7 projects including Indian participants are available on [DG RTD's website<sup>cx</sup>](#).

Stories regarding joint collaborative projects funded under the NEW INDIGO multilateral platform (a FP7 ERA-Net project) can be found [here<sup>cx</sup>](#).

### 9.2. ERC

#### *Unveiling how our genome is protected*

Conducting research in small RNAs, Dr. Ramesh Pillai attempts to understand how the genome protects itself from an internal threat, namely 'transposons' or 'jumping genes' which can cause mutations. Awarded an ERC Starting grant in 2010, Dr. Pillai was then based at the European Molecular Biological Laboratory, Grenoble (France).

Every cell in our body uses small snippets of genetic material (called small RNAs) to identify and control the activity of specific members of more than 25,000 genes. 50% of our genome is host to sequences called "junk", unnecessary for the functioning of the cell. These sequences have a sinister potential, as some of them move about - removing themselves from one location and inserting into a new location in the genome.

Since 2003, researchers became aware of the existence of a special small RNA (called Piwi-interacting RNAs or piRNAs), and current studies are trying to understand their genesis and functioning. Dr Pillai's research draws from protein biochemistry, computational biology, mouse genetics and cell biology - to explain how the genome defends itself against 'transposons' which threaten its integrity. He explains, "Our genome is populated by mobile alien DNA elements called 'transposons' or 'jumping genes' which can move freely within the cell, resulting in mutations. To locate and destroy such trouble-makers, the germ cells of all animals produce particular molecules called piRNAs. Animals lacking these defenders are infertile. My group is studying how these small defenders are generated, and how they function while protecting the genome."

Dr Pillai has shown that 'Piwi' - a protein in our genome that binds the small RNA - is a small RNA-guided enzyme (nuclease). Once the small RNA has identified transcripts (or DNA codes) from the target jumping genes, the Piwi protein destroys it by cutting it up. His group has shown that mice - which are genetically engineered to lack this activity - are infertile as a result of a failure to control transposons. His group has identified 'partner' proteins ('tudor proteins') that team up with Piwis to combat jumping genes by birthing new piRNAs. Research reveals that tudor proteins distinguish Piwis (from thousands of other proteins) by reading out specific chemical modifications on Piwis. The team studies whether the formation of this protein complex can be regulated, thereby making the path taken by the Piwi-interacting RNA (or piRNA) to the targeted DNA more responsive to the requirements of cells. Current efforts are aimed at understanding other components needed for the cell to produce piRNAs. His laboratory uses next-generation sequencing techniques and collaborates with biologists in understanding this machinery. One of their goals is to discover how the cell passes on the tricks it learned in taming transposons on to the next generation. It is hoped that this

research will have future potential benefits in biotechnology, as any ability to manipulate our genome can be applied to the cure of genetic diseases.

For Dr Pillai, “Every researcher aspires to an ERC grant as it is indicative of high-quality research. With secured and substantial funding, we can focus on science. The prestige attached to the grant provides visibility within the scientific community, useful for establishing research contacts.” He collaborates with scientists across the globe in mouse genetics, and bioinformatics, besides engaging with other ERC grant-holders who use mice as models in their RNA research. He says, “The ERC provides a high level of funding, for investing well in infrastructure, for covering high costs of interdisciplinary scientific methods, and for establishing fairly large research groups. For early researchers, the grants are a pathway to independence.” More importantly, the ERC grant has given him the possibility of hiring a specialised team. Originally hailing from India, Dr. Pillai leads a highly diverse and international team, with members from Asia, Europe, North and South America and Australia. “I encourage my team to do good science. I advise those I mentor to pursue research as a career and some of my team members may go on to apply for an ERC grant in the future.”

On the importance of the ERC in an Indian context, Dr Pillai comments, “The ERC is a facilitator of creative ideas and its funding acts as a magnet for researchers to come to Europe. It offers young scientists from countries such as India the chance to benefit from excellent scientific facilities and to be part of the European research experience”.

Amongst the very first Indian researchers to receive an ERC grant, Dr Pillai was awarded his MSc in Biotechnology in India and received his PhD in Switzerland where he also got a post-doctoral fellowship at the Friederich Miescher Institute.

Facts and figures:

Principal Investigator: Ramesh Pillai (India) – Host institution: European Molecular Biological Laboratory (EMBL), Grenoble (France) – Project: Small RNA-guided machinery for epigenetic silencing (PISILENCE) – ERC call: ERC Starting Grant 2010 – ERC funding: 902.849 €.

See the [related video](#)<sup>cxii</sup>.

## 9.3. Erasmus Mundus

### 9.3.1. EUPHRATES project

EUPHRATES – *EU Promotion of Health through Research, Applied Technology, Education and Science in India* – is an Erasmus Mundus Partnership involving 9 European countries and 11 institutions from different parts of India. This consortium is joining forces to foster excellence in training and research, promoting the mobility of Indian students and researchers to the EU. In particular it promotes the mobility of Indian nationals in a particularly vulnerable situation due to social and political reasons. The related grants include travel and insurance costs as well as a monthly allowance ranging from 1000 to 2500 € per month.

The *Universidade de Santiago de Compostela* coordinates this project, supported by a joint-coordinating Indian institution, *Dr. Babasahed Ambedkar Marathwada University*. More information can be found in [this factsheet](#)<sup>cxiii</sup> and in [this presentation](#)<sup>cxiii</sup>.

Please also watch [this video](#).

### 9.3.2. Dr Santosh Bothe

*Dr. Santosh Bothe, recipient of an Erasmus Mundus Fellowship, is currently working as a researcher at the Daksh Foundation, Pune. He is also making presentations on European opportunities for students and researchers. His presentations are a way for him to return to the European Commission what he has so far received from it. Here is an account of his experience:*

As Erasmus Mundus student, I was hosted by the Professor Giovanni Saggio’s research group, Health Involved Technical Engineering Group (HITEG) at University of Rome Tor Vergata in Italy. It was a unique experience of my life working under the supervision of Professor Saggio, where learning by knowledge sharing was the key. I don’t remember a single incident when I wanted to explore my idea and my professor said no. It was a barrier-free environment for research and knowledge gaining. In addition to my main research work, Professor Saggio provided me various opportunities like delivering talks on artificial intelligence under IEEE Student Branch (Institute of

Electrical and Electronics Engineers), co-supervising some Master's students, participating in conferences, obtaining a patent and support for hosting my wife at the university. I never felt the typical gap between student and supervisor. He was more like a colleague cum friend with me, despite his vast experience and depth of knowledge.

Life in Rome was really wonderful. My lab colleagues (especially Carlo Alberto Pinto, Marco Ferrari, Maurizio and Laura) always made me feel at home. They were there when I needed them.

This European fellowship was a turning point of my life as it made me realize my potential and numerous possibilities for my future research career. Besides this I earned good money. The experience helped me for my all round development.

After coming back to India in 2011, there was a very strong feeling that, I must return something to the European Commission. After giving sufficient thought to it I felt like sharing my experience with researchers and students of rural areas as most of them were unaware of such wonderful opportunities for kicking off their research careers.

I purchased a LCD projector and started giving presentations for free. During my interaction I guided them through fellowships and funding opportunities available to students and researchers under EU programmes, as tools offering them a rewarding research career, an opportunity to serve the society at large in terms of your research outcomes. I also introduced using online resources from searching to selection (of fellowship or call) in their own languages. I requested various social organizations, NGOs, Gram panchyats, schools and colleges to organize these free of cost interactions so that we can reach more and more students and researchers to make them aware about the opportunities available to them.

So far I have conducted around 50 different info sessions in different locations since 2011, which have resulted in 39 Erasmus Mundus Fellowship selections at various academic levels. More concretely, my villagers and I are proud of having 4 Erasmus Mundus Fellows among us, and look forward for more to follow.

In my opinion, collaborative research with European organisation is very much straightforward and focused on the needs of the society at large, due to which it has high chances of resulting into useful applications to tackle societal challenges. European and Indian researchers have many complementary factors. If they get coupled, it will always result in good outcomes. The simplicity and flexibility of the funding and working norms of the European Commission help a lot; also the open minded approach of European researchers, supervisors and working potential. If we add to this the huge number of Indian researchers and students, the collaboration will definitely result in many good things for the society.

Now I have committed myself to work in all possible ways for making Indian students and researchers aware of various fellowships and funding programmes of the European Commission.

## 10. INNOVATION AND INDUSTRY RELATED ASPECTS

### 10.1. Within Horizon 2020

As explained in the section on "[Supporting innovation](#)"<sup>cxiv</sup> of the introduction of the Work Programme, Horizon 2020 will provide substantial support for innovation and activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. Some instruments are specifically designed for this purpose, i.e. "innovation actions" and "fast-track-to-innovation" actions ([example](#)<sup>cxv</sup>).

It is quite remarkable that even in the context of the ERC – relating to fundamental research –, there is a scheme that clearly targets innovation. Indeed, *Proof-of-Concept grants* aim to maximise the value of excellent research that the ERC funds, by funding further work (i.e. activities which were not scheduled to be funded by the original ERC frontier research grant) to verify the innovation potential of ideas arising from ERC funded projects. The ERC has also created a working group on "[Relations with industry](#)"<sup>cxvi</sup>, which

has been very active in establishing good relations with industry and in the design, development, implementation and follow-up of the *Proof-of-Concept* scheme.

## 10.2. In general

### **Promoting the exploitation of publicly-funded research results...**

... is a key policy objective in most countries of the world. Many papers refer to this objective, including an OECD report on "*Commercialising Public Research – New Trends and Strategies*"<sup>cxvii</sup> (2013), that is quite valuable in an international perspective.

Getting good ideas to market is also becoming increasingly easier and effective across the EU, as stated in a recent report<sup>cxviii</sup> on the *State of the Innovation Union*.

In 2011, a Commission-funded expert group has delivered a report on "*International knowledge transfer – Investigations of European Practices*"<sup>cxix</sup> that provides detailed case studies and related lessons involving several European and non-European countries, including India. Still in a very operational perspective, the IPR Helpdesk published a factsheet on "*Exploitation channels for public research results*"<sup>cxx</sup> (2014)

Interesting country reports on university-industry cooperation in various EU countries can be downloaded on the UBC website<sup>cxxi</sup> (*University-Business Cooperation* information portal). Reference should also be made to the ASTP-PROTON<sup>cxii</sup> pan-European knowledge transfer association – member of the international ATTP<sup>cxiii</sup> (*Alliance of Technology Transfer Professionals*) – which organises numerous training and other events.

### **IPR protection**

In addition to protection in India (cf. Indian Patent Office) and in other countries (USA, etc.), Indian participants should seriously consider filing (where appropriate) *European patent applications*. European patents<sup>cxiv</sup> are reputed for their quality and hence their high degree of legal certainty. Moreover, a European patent can designate (or be extended in) up to 42 countries (as of 2013), providing broad protection in the largest market of the world. While a European patent is currently equivalent to a bundle of national patents (which must for instance be litigated separately), in the future the same procedure will make it possible to request, in respect of 26 of the EU member states, the grant of a unitary EU patent keeping its unitary nature after grant (with centralised litigation).

Where trademarks or designs are concerned, the EUIPO (formerly OHIM) can register them as *Community trademarks* or *Community designs*, protected throughout the EU in a unified way.

### **Open access dissemination**

Under Horizon 2020, each beneficiary must ensure open access to all peer-reviewed scientific publications relating to its results. In addition, a novelty in Horizon 2020 is the *Open Research Data Pilot* (applicable to certain projects only) which aims to improve and maximise access to and re-use of research data generated by projects. More information on this open access policy can be found in the Commission's guidelines<sup>cxv</sup> and in a factsheet<sup>cxvi</sup> of the IPR-Helpdesk.

## 11. HIGHER EDUCATION IN THE EU – ERASMUS+ PROGRAMME

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

Erasmus+ offers **scholarships** for students, doctoral candidates and staff, and therefore will continue the objectives of Erasmus Mundus. From 2004 to 2013, nearly 3400 Indian students, fellows, scholars and university staff have benefitted from Erasmus Mundus scholarships, bringing them to at least one European country for academic exchange. More than 50 Indian universities partnered with European universities for the facilitation of academic mobility under Erasmus Mundus.

It will also fund capacity-building projects involving higher education institutions from all over the world including India, 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](#)<sup>cxxvii</sup> of the European Commission, where you can find in particular a very detailed [Programme Guide](#)<sup>cxxviii</sup>, as well as a page specifically focusing on [cooperation outside the EU](#)<sup>cxxix</sup>.

## 12. R&I-RELATED PITFALLS IN INDIA

Certain issues may hinder or prevent collaboration between Indian and European participants in Horizon 2020 projects (or even in broader contexts).

### 12.1. Visas

#### ISSUE

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

#### COMMENTS

Regarding **European nationals applying for Indian visas**, the rules may differ from one EU member state to the other, so that candidates should better check with the Indian embassy of their home country (which will help them select the most appropriate type of Indian visa: conference, research, employment, etc.). Related information can be found on the website of the Indian [Ministry of External Affairs](#)<sup>cxxx</sup> and on those of Indian embassies in Europe.

Regarding **Indian nationals applying for European visas**, rules are also different for each EU member state<sup>8</sup>, although some common principles do apply, especially in the countries member of the "[Schengen Area](#)"<sup>cxxxii</sup> and also as a consequence of the European Directives on the "[Scientific Visa Package](#)"<sup>cxxxiii</sup> and on the "[Blue Card](#)"<sup>cxxxiii</sup> for highly-skilled workers. The [EURAXESS Service Centres](#)<sup>cxxxiv</sup> provide advice and support to researchers and their families moving to Europe, including on visa formalities.

Links to the websites of Indian diplomatic representations in Europe and European diplomatic representation in India are provided by [EURAXESS Links India](#)<sup>cxxxv</sup>.

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<sup>8</sup> For example, Indian nationals who have completed their graduation in France at either masters or PhD level can now obtain a five-year visa for France.

## 12.2. Government of India (GoI) clearance for Indo-EU/MS collaborative projects

### ISSUE

For "sensitive" projects, Indian researchers need to obtain clearance from the relevant Indian ministry or department before participating in an Indo-EU/MS collaborative project.

### COMMENTS

The authority responsible for approving/clearing Indo-EU/MS collaborative projects depends on the scope of the project. The *Ministry of Health and Family Welfare* and the *Ministry of Science and Technology* clear most of EU-India projects (H2020, ERA-NET, coordinated call projects, etc.).

- *Ministry of Science and Technology*: all projects involving Ministry of S&T agencies – Department of Biotechnology (DBT), Council for Scientific and Industrial Research (CSIR), Department of Science and Technology (DST).
- *Ministry of Health and Family Welfare*: all health/biomedical research involving human subjects/material, involving *Ministry of Health and Family Welfare* Institutions, ICMR institutes, medical schools, universities, public and private research institutes/universities or NGOs.
- Autonomous institutes/universities (such as IITs, IISERs, AIIMs, Central and State Universities) are empowered to take decisions on their in-house proposals for foreign (EU/MS) collaboration (while official clearance is still required for "sensitive" projects).

Only Indian investigators are entitled to (and must) apply for Government of India (GoI) clearance for Indo-EU/MS collaborative projects.

## 12.3. Biomedical/health research: *Health Ministry Screening Committee (HMSC)* clearance

### ISSUE

Collaborative research projects involving foreign assistance and/or collaboration in the biomedical/health area, involving human subjects/material, require approval by the *Health Ministry's Screening Committee (HMSC)*<sup>cxxxvi</sup>.

### COMMENTS

The *Indian Council for Medical Research (ICMR)*<sup>cxxxvii</sup>, part of the *Ministry of Health and Family Welfare*, is the secretariat for the HMSC (see *ICMR Guidance for International Collaborations*<sup>cxxxviii</sup>). The projects are reviewed by the concerned Technical Divisions at ICMR, and then submitted to the HMSC for decision.

All applicants from India must familiarise themselves with the processes for approval of the *Health Ministry Screening Committee (HMSC)*, as this clearance is mandatory for the funding of full proposals. The details are available in an *Office Memorandum*<sup>cxxxix</sup> under the heading "International Collaboration".

The HMSC meets every three months (in March, June, September and December). Please note that because of the competing demands on Chairperson/HMSC members' time, these meetings get often rescheduled.

The HMSC review process is as follows:

- HMSC may approve the project. In this case, ICMR send the approval letter to the Indian PI. The Indian PI should inform HHS office in New Delhi, so that we can send an official note to NIH. HMSC requires that Indian PI should submit yearly progress reports to ICMR.
- HMSC does not approve the project, and will then ask for additional information.
- HMSC may disapprove/reject the project, in which case the project **cannot** be initiated. Criteria for rejection are wide-ranging, starting from significance of the work proposed, suitability of the investigators (especially NGOs), capacity of the institution to support the work outlined in the project.

The approval/clearance procedure of HMSC may take 3-9 months, depending on the timing of the proposal submission, questions raised by HMSC, and replies of the investigators.

**NOTE:** Indian researchers included in EU (HORIZON 2020, INNO INDIGO, etc.) proposals are strongly advised to submit the proposal to ICMR/HMSC for review while the project proposal is being evaluated by the European Commission, without waiting for the final outcome of the evaluation.

## 12.4. Cross-border exchange/transfer of human biological material for biomedical research purposes

### ISSUE

Specific and quite stringent rules defined by Indian authorities must be obeyed when transferring human biological materials from India to the EU, or vice-versa. Failure to properly comply with these rules may lead to significant problems and/or delays during the implementation of a project requiring such transfers.

### COMMENTS

This section is based on information relating to human biological material transfers in international collaborative research projects, provided by the *Ministry of Health and Family Welfare*, as well as on experience collected by the *Delegation of European Union to India*. It has been reviewed by officials of the *Indian Council of Medical Research* (ICMR<sup>9</sup>).

ICMR recommends that Indian co-PIs submit the transfer proposal for approval while the grant application is being reviewed by the funding agency. In this way, ICMR/HMSC approval will be obtained in parallel with the funding decision, thus hastening the project implementation by at least six to nine months.

On the **Indian** side, at least two set of rules apply: WHO rules applicable to transfers of samples (addressed below), and Indian *Guidance on transfer of human biological material<sup>ext</sup> for commercial purposes and/or research for development of commercial products*, available from the website of ICMR – which also processes requests for such transfers.

This guidance defines modalities and mechanisms for transfers of human biological material for biomedical research, and regulates the exchange of biological material for commercial purposes. The document categorically states that if the material transfer is envisaged as part of a collaborative research project, the proposal must be routed through the appropriate authorities for **mandatory evaluation and clearance**.

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<sup>9</sup> For queries please contact Dr Hardeep Sandhu, Senior Research Officer, International Health Division, ICMR – [sandhuh@icmr.delhi.nic.in](mailto:sandhuh@icmr.delhi.nic.in).

The exchange of human biological material should be an integral part of a collaborative project, which should have been approved by the *Institutional Review Board* (IRB) and/or the *Institutional Ethics Committee* (IEC) and not be a separate activity. It advocates that in order to protect the rights of the Indian study subjects as well as Indian scientists/organizations, *Memoranda of Understanding* and/or *Material Transfer Agreements* (MTAs<sup>cxli</sup>) should be entered into between the collaborating partners (both Indian and foreign). These should include detailed information including identification of the receiving/sending parties, of the material to be transferred and its quantity, the purpose of the transfer; the nature of the investigations to be conducted utilising the material; any confidentiality and intellectual property arrangements; safety norms to be observed, shipping arrangements, etc.

Requests for transfer of biological material for research/diagnostic purposes in biomedical research, after scrutiny and decision by the respective agencies/departments, have to be submitted to the *Health Ministry's Screening Committee* (HMSC) for final endorsement.

In consultation with the *Directorate General of Foreign Trade* (DGFT) and the *Drugs Controller General of India* (DCGI), the Director General of ICMR constituted in 2010 a committee for deciding each proposal for transfer of human biological material.

Applications<sup>cxlii</sup> for transfer of biological material for research/commercial purposes are submitted in response to announcements made on the ICMR website, with deadlines of **January 31, April 30, July 31** and **October 31** in each calendar year.

In addition, Indian and European applicants should follow the 'Guidance on regulations for the transport of infectious substances'<sup>cxliii</sup> published by the *World Health Organization* (WHO), as well as the specific packaging instructions<sup>cxliv</sup> as per United Nations (class 6.2) specifications to be followed during transport of infectious substances (including blood and/or blood components, and medical or clinical wastes).

## 12.5. Cross-border exchange of plant material

India has distinct national Guidelines for International Collaboration Research Projects Involving Transfer or Exchange of Biological Resources or Information relating thereto<sup>cxlv</sup>. As explained in these guidelines, the *Ministry of Environment & Forests* has a mechanism of environmental approval for the transfer of clinical, veterinary and food products based on hazardous microorganisms / genetically modified organisms for research purposes.

The *Department of Biotechnology* has formulated revised guidelines<sup>cxlvi</sup> (read also this<sup>cxlvii</sup>) for research in transgenic plants and guidelines for toxicity and allergenicity evaluation for transgenic seeds, plants and plant parts, also applicable to their transfer.

## 12.6. Financial transfers from Europe to India

### ISSUE

Transfer of foreign funding into India for Indo-EU collaborative research projects requires clearance from the Indian administration (and even the approval of the *Reserve Bank of India* (RBI) for transfers in a currency other than the Rupee).

### COMMENTS

Proposals involving overseas funding/investigators require approval by a Secretary of the concerned Ministry, depending on the scope of the project. This applies in particular:

- to all projects involving agencies of the *Ministry of Science and Technology* (MST) such as the *Department of Biotechnology* (DBT), the *Council for Scientific and Industrial Research* (CSIR) or the *Department of Science and Technology* (DST);
- to all health/biomedical research involving human subjects/material involving institutions of the *Ministry of Health and Family Welfare* (MHFW), ICMR institutes, medical schools, universities, public and private research and development institutes or NGOs.

In such cases, payments made to an Indian organisation will require Indian administration's clearance, even if they are made in Rupees.

In addition, transfers made in euros – for instance payments made by the European Commission to an Indian university acting as project coordinator – require the approval of the *Reserve Bank of India* (RBI).

Indian participants which are not coordinators are thus advised to request their project coordinator to transfer funds to them in Rupees.

## 12.7. Innovation and market access issues

### 12.7.1. Intellectual property

#### ISSUE

The IPR rules in India 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<sup>cxlviii</sup>. While many of these explanations remain valid, a new similar guide should be available soon for H2020, based on the related IPR provisions, that can be found, with explanations, in the annotated Grant Agreement<sup>cxlix</sup>. Explanations can also be found in the IPR Helpdesk's guide<sup>cl</sup>.

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 still that each participant owns the results (and related IP, if any) that it has generated (with joint ownership being possible in specific cases).

While the application of this rule is quite obvious in classical collaborative projects (results belong to [some of] the project participants), it should be noted for instance that in most ERC grants (see the related model agreement<sup>cli</sup>) and Marie Skłodowska-Curie *Individual Fellowships* (MSCA-IFs) (see the related model grant agreement<sup>clii</sup>), the results are owned by the host institutions (since they are the beneficiaries) and not by the individual researchers (PIs and team members in ERC grants, recruited researchers in MSCAs).

- **IPR-related assistance**

IPR-related information and free-of-charge assistance can be obtained from the (European) IPR Helpdesk<sup>cliii</sup>. It has developed various information material, such as this document<sup>cliv</sup> on IP management in Horizon 2020 at the proposal stage, and another one focusing on "How to manage IP in Horizon 2020: at the implementation stage"<sup>clv</sup>.

- **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"<sup>clvi</sup> (2012) and in the Commission Recommendation on the management of intellectual property in knowledge transfer activities and Code of Practice for universities and other public research organisations<sup>clvii</sup> (2008), which builds on the 2007 Commission Communication "Improving knowledge transfer between research institutions and industry across Europe: embracing open innovation"<sup>clviii</sup> (which didn't have a specific international focus).

Although somewhat older, the report of the Commission-funded "Expert group report on role and strategic use of IPR in international research collaborations"<sup>clix</sup> also provided a number of valuable recommendations.

A presentation of India's IPR system, with comments on the related *policy level barriers and market obstacles*, can be found in a recent EBTC report<sup>clx</sup>.

In addition, the UK published a brochure on "Intellectual property rights in India"<sup>clxi</sup> and an "Indo-UK IPR toolkit"<sup>clxii</sup> (including a detailed document on "Management of intellectual property in Indo-UK R&D collaborations – Toolkit to support effective management of IP"<sup>clxiii</sup>).

Although they focus on university-industry collaboration in general, it is also worth mentioning the "Responsible Partnering Guidelines"<sup>clxiv</sup> prepared by four public and private sector associations.

- **Patentability criteria**

While Indian patentability criteria are broadly similar to those applicable in the EU, with many common features (such as the non-patentability of software, as in Europe<sup>clxv</sup>), slight discrepancies may nevertheless arise in certain fields.

Regarding the specific rules applicable to biotechnological inventions, for instance, see the EBTC's Guideline to patentability assessment standards for biotechnology inventions in India<sup>clxvi</sup> and India's official Guidelines for examination of biotechnology applications for patent<sup>clxvii</sup>.

One discrepancy relates to the patentability of *new forms of known substances*, in particular pharmaceutical molecules (e.g. salts, isomers, combinations and other derivatives of known substances). Indeed, Section 3(d) of the Indian Patent Act excludes "*the mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance*" (and in that context, "efficacy" must be interpreted as *therapeutic* efficacy, which is even more restrictive). This provision has already resulted in a number of Indian patents being refused or revoked for pharmaceuticals that, however, have been successfully patented in the EU.

Another discrepancy is that India does not allow *second medical use* claims.

With respect to the ICT sector (including software), a joint "Indo-European conference on ICT-related patents" was fruitfully organised in Munich in November 2014 – see its final report<sup>clxviii</sup>.

### **12.7.2. Market access**

Insofar as brokerage events are concerned, this document<sup>clxix</sup> of the IPR-Helpdesk provide guidance on how to adequately protect your intellectual property in such events (without focusing specifically on India).

Standardisation issues may be relevant in specific sectors, and a recent study<sup>clxx</sup> (2013) demonstrates the contribution of standardization to innovation in European-funded

research projects. More information on standardisation in the EU and in India can be found [here](#)<sup>clxxi</sup>.

The [Export Helpdesk](#)<sup>clxxii</sup> of DG Trade informs on the EU tariffs, requirements, preferential arrangements, quotas and statistics affecting business in developing countries.

### 13. USEFUL RESOURCES AND SUPPORT SERVICES

A number of EU-funded (mostly free-of-charge) services specifically targeting India are available:

- [NEW INDIGO](#)<sup>clxxiii</sup> provided (until 2013) information on research collaborations between India and the EU, and also funded such collaborative projects, namely through specific calls for proposals. It was run by a consortium of European and Indian S&T organisations, and funded by the EU, some of its member states, and India (DST, DBT). Since 2014 it has been replaced by the [INNO-INDIGO](#)<sup>clxxiv</sup> project, while the new [INDIGO-POLICY](#)<sup>clxxv</sup> provides assistance at policy level (they have a [joint web site](#)<sup>clxxvi</sup>). The [EU-India S&T Cooperation Portal](#)<sup>clxxvii</sup>, created at the initiative the NEW INDIGO, is no longer updated but still provides access to the key multilateral support projects and initiatives on EU-India S&T (R&I) cooperation.
- The [India GATE](#)<sup>clxxviii</sup> and [EUINEC](#)<sup>clxxix</sup> projects (both completed) promoted EU-India S&T Cooperation, the first one by providing information about funding opportunities available in India open for European organisations, and the second one by increasing awareness among Indian and European stakeholders about cooperation opportunities through information and capacity building activities.
- [EURAXESS Links India](#)<sup>clxxx</sup> is the Indian branch of *EURAXESS Links*, an information and networking tool for European researchers working outside Europe and non-European ones (e.g. Indians) wishing to collaborate and/or pursue a research career in Europe. *EURAXESS Links* provides information about research in Europe, job vacancies, European research policy, as well as opportunities for research funding, international collaboration and trans-national mobility. It also organizes networking events. Membership is free.  
*EURAXESS Links* is the external window of [EURAXESS-Researchers in Motion](#)<sup>clxxxi</sup>, a European Commission initiative backed by the 40 countries that make the *European Research Area* (ERA). *EURAXESS Links* has thus far been launched in North America (Canada and the USA), Japan, China, India, the ASEAN hub (Singapore, Thailand, Malaysia, Indonesia and Vietnam) and Brazil.
- The [European Business Group India](#)<sup>clxxxii</sup> (EBGI) is an initiative taken in 1997 by European businessmen with the support of the Delegation of the European Commission to India. It is the representative body of European business interests in India. With Chapters in New Delhi, Mumbai and Bangalore, it provides a focal point for individuals who pursue business in India. While it is not research-centric, the EBGI has an innovation Chapter in Bangalore.
- [Focal Points](#)<sup>clxxxiii</sup> have been appointed in a number of Indian research institutions or universities; they can provide local staff and students with assistance regarding Horizon 2020 (see [example](#)<sup>clxxxiv</sup>);

Should you have questions about any aspect of European research in general and the EU Research Framework Programmes in particular, send them to [Horizon 2020 Helpdesk](#)<sup>clxxxv</sup>.

Links to relevant web pages of EU member states can be found on [this page](#)<sup>clxxxvi</sup> of the EU Delegation to India.

## 14. WORK PROGRAMME 2016-17 FOR HORIZON 2020

The Work Programme is an official document that clarifies, for the different areas covered by Horizon 2020, which calls for proposals are going to be published. This document is updated every two years, so as to cover the next two years.

Below are links to most chapters of the *Work Programme 2016-17*.

For a more complete and up-to-date list of documents, please refer to the official [list of H2020 reference documents](#)<sup>clxxxvii</sup> (that includes the first (2014-15) and second (2016-17) versions of the Work Programme).

- [Introduction](#)<sup>clxxxviii</sup>
- [Future and Emerging Technologies \(FETs\)](#)
- Leadership in enabling and industrial technologies (LEITs):
  - [Introduction to Leadership in enabling and industrial technologies](#)
  - [Information and communication technologies \(ICT\)](#)
  - [Nanotechnologies, advanced materials, advanced manufacturing and processing, biotechnology](#)
  - [Space](#)
- Societal challenges (SCs):
  - [Health, demographic change and wellbeing](#)
  - [Food security, sustainable agriculture and forestry, marine and maritime and inland water research and the bio-economy](#)
  - [Secure, clean and efficient energy](#)
  - [Smart, green and integrated transport](#)
  - [Climate action, environment, resource efficiency and raw materials](#)
  - [Europe in a changing world - inclusive, innovative and reflective societies](#)
  - [Secure societies - Protecting freedom and security of Europe and its citizens](#)
- Marie Skłodowska-Curie Actions (MSCAs)
- European Research Council (ERC): [WP 2016](#)
- [EURATOM Work Programme 2016-17](#).

For more information on the calls for proposals, please refer to the [Participant Portal](#)<sup>clxxxix</sup>.

## 15. GLOSSARY

A glossary explaining most of the [reference terms](#)<sup>cx</sup> related to Horizon 2020 is available on-line. For more convenience, the definitions of a few important terms are also provided below.

- A **Beneficiary** is a legal person (other than the European Commission) that is a party to the Grant Agreement.
- The **Grant Agreement** is the contract concluded between the European Commission and the beneficiary/ies, defining the parties' rights and obligations for a certain project. It consists of the basic text and annexes.

- A **Member State** is a state that is party to treaties of the European Union (EU) and thereby subject to the privileges and obligations of European Union membership – for instance France, Germany, the UK, Belgium, etc.
- A **Third Country** is a state that is not member of the EU – for instance **India**, Japan, or the USA.
- An **Associated Country** is a third country which is party to an international agreement with the EU, enabling its legal entities to participate in Horizon 2020 under the same conditions as legal entities from EU Member State. Examples of countries associated to Horizon 2020 include Norway, Turkey, Israel, etc.



# End notes

You can find below the explicit URLs of the links embedded above in this document.

- 
- <sup>i</sup> [http://europa.eu/about-eu/index\\_en.htm](http://europa.eu/about-eu/index_en.htm)
- <sup>ii</sup> [http://ec.europa.eu/research/innovation-union/pdf/competitiveness\\_report\\_2013.pdf](http://ec.europa.eu/research/innovation-union/pdf/competitiveness_report_2013.pdf)
- <sup>iii</sup> [http://ec.europa.eu/research/era/pdf/era\\_progress\\_report2013/era\\_facts\\_and\\_figures\\_new.pdf](http://ec.europa.eu/research/era/pdf/era_progress_report2013/era_facts_and_figures_new.pdf)
- <sup>iv</sup> [http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014\\_en.pdf](http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014_en.pdf)
- <sup>v</sup> [http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2013/state\\_of\\_the\\_innovation\\_union\\_report\\_2013.pdf](http://ec.europa.eu/research/innovation-union/pdf/state-of-the-union/2013/state_of_the_innovation_union_report_2013.pdf)
- <sup>vi</sup> <http://home.web.cern.ch>
- <sup>vii</sup> <http://www.erf-aisbl.eu>
- <sup>viii</sup> [http://ec.europa.eu/research/infrastructures/index\\_en.cfm?pg=esfri](http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri)
- <sup>ix</sup> [http://ec.europa.eu/research/infrastructures/index\\_en.cfm?pg=mapri](http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=mapri)
- <sup>x</sup> [http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard-2013\\_sti\\_scoreboard-2013-en](http://www.oecd-ilibrary.org/science-and-technology/oecd-science-technology-and-industry-scoreboard-2013_sti_scoreboard-2013-en)
- <sup>xi</sup> [http://dst.gov.in/whats\\_new/whats\\_new12/report.pdf#page=186](http://dst.gov.in/whats_new/whats_new12/report.pdf#page=186)
- <sup>xii</sup> [http://eeas.europa.eu/delegations/india/documents/snt\\_update\\_26\\_oct\\_12/overview\\_of\\_research\\_and\\_innovation\\_coop\\_july\\_2012.pdf](http://eeas.europa.eu/delegations/india/documents/snt_update_26_oct_12/overview_of_research_and_innovation_coop_july_2012.pdf)
- <sup>xiii</sup> [http://erc.europa.eu/sites/default/files/publication/files/boost\\_your\\_research\\_career\\_come\\_to\\_europe\\_0.pdf#page=2](http://erc.europa.eu/sites/default/files/publication/files/boost_your_research_career_come_to_europe_0.pdf#page=2)
- <sup>xiv</sup> <http://ec.europa.eu/programmes/horizon2020/>
- <sup>xv</sup> [http://ec.europa.eu/information\\_society/newsroom/cf/horizon2020/document.cfm?action=display&doc\\_id=4752](http://ec.europa.eu/information_society/newsroom/cf/horizon2020/document.cfm?action=display&doc_id=4752)
- <sup>xvi</sup> <http://cascade-inconet.eu/sites/default/files/Information%20Sheet.pdf#page=2>
- <sup>xvii</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012DC0497&rid=1>
- <sup>xviii</sup> [http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014\\_2015/annexes/h2020-wp1415-annex-a-countries-rules\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-a-countries-rules_en.pdf)
- <sup>xix</sup> [http://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/3cpart/h2020-hi-list-ac\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cpart/h2020-hi-list-ac_en.pdf)
- <sup>xx</sup> [http://erc.europa.eu/sites/default/files/publication/files/ERC\\_Grant\\_Schemes\\_2014\\_0.pdf](http://erc.europa.eu/sites/default/files/publication/files/ERC_Grant_Schemes_2014_0.pdf)
- <sup>xxi</sup> <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/marie-skłodowska-curie-actions>
- <sup>xxii</sup> [http://ec.europa.eu/research/mariecurieactions/documents/funded-projects/statistics/non-eu/marie-curie-actions-country-fiche-in\\_en.pdf?country=%2Fresearch%2Fmariecurieactions%2Fdocuments%2Ffunded-projects%2Fstatistics%2Fnon-eu%2Fmarie-curie-actions-country-fiche-in\\_en.pdf](http://ec.europa.eu/research/mariecurieactions/documents/funded-projects/statistics/non-eu/marie-curie-actions-country-fiche-in_en.pdf?country=%2Fresearch%2Fmariecurieactions%2Fdocuments%2Ffunded-projects%2Fstatistics%2Fnon-eu%2Fmarie-curie-actions-country-fiche-in_en.pdf)
- <sup>xxiii</sup> [http://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/3cpart/h2020-hi-list-ac\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cpart/h2020-hi-list-ac_en.pdf)
- <sup>xxiv</sup> [http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014\\_2015/annexes/h2020-wp1415-annex-a-countries-rules\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-a-countries-rules_en.pdf)
- <sup>xxv</sup> [http://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2016-2017/annexes/h2020-wp1617-annex-ga\\_en.pdf#page=10](http://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2016-2017/annexes/h2020-wp1617-annex-ga_en.pdf#page=10)
- <sup>xxvi</sup> <http://ec.europa.eu/programmes/horizon2020/h2020-sections>
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- <sup>xxviii</sup> [http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference\\_docs.html#h2020-work-programmes-2016-17](http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-work-programmes-2016-17)
- <sup>xxix</sup> <http://ec.europa.eu/research/participants/portal/desktop/en/funding/index.html>

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- xlvi [http://cordis.europa.eu/projects/home\\_en.html](http://cordis.europa.eu/projects/home_en.html)
- xlvii <http://eeas.europa.eu/delegations/india/documents/catalogue.pdf>
- xlviii <http://ec.europa.eu/euraxess/index.cfm/links/index>
- xliv [http://ec.europa.eu/research/participants/portal/desktop/en/support/national\\_contact\\_points.html](http://ec.europa.eu/research/participants/portal/desktop/en/support/national_contact_points.html)
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- ii [http://eeas.europa.eu/delegations/india/documents/snt\\_update\\_26\\_oct\\_12/overview\\_of\\_research\\_and\\_innovation\\_coop\\_july\\_2012.pdf](http://eeas.europa.eu/delegations/india/documents/snt_update_26_oct_12/overview_of_research_and_innovation_coop_july_2012.pdf)
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- liiv <http://www.rcuk.ac.uk/international/Offices/OfficeinIndia/Pages/home.aspx>
- liiv <http://icdk.um.dk/en/about-us/innovationcentres/new-delhi/>
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- lxix <http://www.waterjpi.eu>
- lxix <http://www.jpjamr.eu>
- lxix <http://gita.org.in/funding.html>
- lxix <http://www.embo.org/funding-awards>

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- lxvii <http://ec.europa.eu/euraxess/index.cfm/jobs/index>
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- lxix <http://erc.europa.eu/funding-schemes>
- lxx <http://erc.europa.eu/step-step>
- lxxi [http://erc.europa.eu/sites/default/files/document/file/ERC\\_Work\\_Programme\\_2016.pdf](http://erc.europa.eu/sites/default/files/document/file/ERC_Work_Programme_2016.pdf)
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- lxxv <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/excellent-science>
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- lxxxi [http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014\\_2015/main/h2020-wp1415-msca\\_en.pdf#page=39](http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-msca_en.pdf#page=39)
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