



# FP-DYNAMO-PARIS FELLOWSHIP PROGRAMME



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 101034407



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## ABOUT FP-DYNAMO-PARIS FELLOWSHIP PROGRAMME

The **FP-DYNAMO-PARIS fellowship programme** will tackle fundamental scientific questions in the field of energy conversion using interdisciplinary and quantitative approaches. It is a proposition from the DYNAMO Laboratory of Excellence (LabEx), **federating since 2012 three major French institutions, the Institut de Biologie Physico-Chimique (IBPC; 5 laboratories), the École Normale Supérieure (ENS; 1 laboratory) and the Collège de France (CdF; 1 laboratory)**, and dedicated to the study of the physico-chemical processes governing energy production in biological systems.

These new research areas bring new challenges of increasing urgency requiring the training of a new generation of researchers capable of leading scientific progress in complex and interdisciplinary fields. The DYNAMO consortium is structured to answer this challenge in providing post-doctoral researchers with a human environment that will foster their growth as future leaders in this field. This will be done through an almost century-long interdisciplinary tradition, combined with strong links with international as well as non-academic partners, in a 3i approach to research.

The goal of the FP-DYNAMO-PARIS fellowship programme is to bring new conceptual advances in environmental and health sciences by recruiting promising experienced researchers (ERs) to the Labex DYNAMO consortium with a selection process that combines excellence and inclusivity to choose promising post-docs; by providing them with both a professional opportunity to further their scientific projects, improve their personal skills and create networking opportunities to reinforce their profiles; and by preparing them to face the challenges of their future career positions when they will have research teams of their own. To this end, their research activity will be accompanied by opportunities to expand their skillset with personalized mentoring, outreach programmes and dedicated courses. Part of the FP-DYNAMO-PARIS training programme will include a retreat for ERs at the University of Padova, training courses in leadership by EMBO, lectures on intellectual property and entrepreneurship and mentoring on gender-balance ethical issues and leadership.

From gene expression and genome organization to the final assembly of the macromolecular photosynthetic complex in cellular membranes, FP-DYNAMO-PARIS ERs will explore the energy conversion machineries developed by microorganisms across evolution. FP-DYNAMO-PARIS ERs will be trained in state-of-the-art techniques and will acquire expertise in genomics, genetics, photobiology, biophysics, biochemistry, structural **biology, and learn how to synthesise new materials and equipment needed for research in the field of bioenergy.**

## PROPOSED POST-DOCTORAL FELLOWSHIPS

The **FP-DYNAMO-PARIS fellowship programme** is co-funded by the European Union's H2020 Programme under the Maria Sklodowska-Curie Actions (Grant Agreement N°101034407).

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THE FP-DYNAMO-PARIS offers 21 post-doctoral fellowships. There are 2 calls :

- 1st call - 17<sup>th</sup> September – 17<sup>th</sup> November 2021 – 13 positions available
- 2nd call - January 2022 – 8 post-doctoral positions available

## SUBJECTS

### Axis 1 : RNA biology from bacteria to chloroplast

- [Control of translation initiation in bacteria : a transcriptomic study, PI: M. Guillier](#)
- [Structural biology of RNA-protein complexes, PI: C. Tisné](#)
- [Elucidating the role of yeast Ded1, a DEAD-box RNA helicase, in translation elongation\\*, PI: K. Tanner](#)
- [Understanding the role of the key ribonuclease RNase Y in the control of gene expression in \*B. subtilis\*\\*, PI: H. Putzer](#)
- [Structural study of \[4Fe-4S\]-dependent sulfuration enzyme MnmA involved in genetic translation\\*, PI: B. Golinelli-Pimpaneau](#)
- [In-depth characterization of the CES regulation coupling Rubisco large subunit synthesis and assembly in \*Ch. reinhardtii\*, PI: K. Wostrickoff](#)

### Axis 2 : Membrane system dynamics

- [AtpF-mediated membrane biogenesis in \*E. Coli\* and \*C.reinhardtii\*, PI: F.Zito, co-PI: B.Miroux](#)
- [Study of the energy landscape of G protein-coupled receptors, PI: L. Catoire, co-PI: K. Moncoq](#)
- [Investigating the effects of allelochemicals secreted by dinoflagellates on the thylakoid membranes of marine diatoms, PI: B. Bailleul](#)
- [Flippable ELP-decorated proteoliposomes to prepare nano-bioreactors\\*, PI: C. Tribet](#)

### Axis 3 : Computational modelling of protein assemblies (3 positions from the following possible subjects)

- [Protein-protein interactions in the purinosome metabolon, PI: F. Sterpone](#)
- [Multiscale approaches to investigate the conformational landscape of flexible protein assemblies, PI: S. Sacquin-Mara, co-PI: A.Taly](#)
- [Advanced scientific visualization of membrane proteins and their assemblies, PI: M. Baaden, co-PI A. Taly](#)
- [Regulation of mitochondrial function/dysfunction by focused ultrasound, PI: P. Nguyen](#)

\*These projects are funded for one year only

The duration of a fellowship goes from 12 to 24 months, depending on the project. The fellowship should be consecutive and it is not possible to divide the fellowship period into smaller parts. The fellowship is a full time position and it is not possible to extend the fellowship by working part time.

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## PARTNERS



### **National Centre for Scientific Research (CNRS)**

The **French National Centre for Scientific Research** (CNRS) is among the world's leading research institutions. It is a public organisation under the administrative supervision of the French Ministry of Higher Education and Research, entrusted with the role of advancing knowledge for the benefit of society. Its scientists explore the living world, matter, the Universe, and the functioning of human societies to meet the major challenges of today and tomorrow. Internationally recognised for the excellence of its interdisciplinary scientific research, the CNRS is a reference in the world of research and development, as well as for the general public. It is the largest public basic research organisation in Europe and is well reputed for being able to accomplish this national mission while respecting ethical rules and showing commitment to professional equality.



### **The LabEx DYNAMO** (Paris, France)

The LabEx DYNAMO federates around 90 internationally recognised researchers from seven CNRS research laboratories that work in the centre of Paris at the IBPC, ENS and CdF three umbrella universities. Created in March 2012, the LabEx DYNAMO was selected as one of a small number of French "Laboratories of Excellence (LabEx)" in Life Sciences. The scientific research programme of the LabEx DYNAMO has been validated twice, in 2012 and 2018, by international juries. It tackles fundamental scientific questions related to the evolution of energy-producing organelles from their bacterial ancestors, the membrane dynamics and the supramolecular organisation electron transfer machineries.



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## ELIGIBILITY CRITERIA AND APPLICATION REQUIREMENTS

To be eligible, applicants must be in a possession of a doctoral degree, have a research experience in the areas relevant to the call and be in compliance with the MSCA mobility rule, *i.e.* the candidate must not have resided or carried out their main activity (e.g. work or studies) in France for more than 12 months in the 3 years immediately before the recruitment date.

### HOW TO APPLY

All the candidates need to submit their application via CNRS Portail Emploi, [click here to APPLY](#)

In addition we kindly ask you to send your documents mentioned below to [dynamocofund@ibpc.fr](mailto:dynamocofund@ibpc.fr) :

- CV (in English)
- Motivation letter describing short and long-term scientific and careers goals
- Research theme(s) (with the name of the PI) you are applying for
- A minimum of 2 reference letters
- Signed statement that you are in compliance with the Mobility rule

### SELECTION PROCESS

FP-DYNAMO-PARIS will follow the principles of the European Human Resources Strategy for Researchers (HRS4R), adopted by the CNRS in 2017 and implemented in the host institutes. During the recruitment process, eligible candidates will have the opportunity to interact directly with the future host laboratory and supervisor, and as such, get full insight into the research opportunities, mentoring and training programs that are offered.

#### Composition of the committees involved in the different stages of the selection process

- **The Programme Management Team (PMT)** is composed of the Programme Coordinator (PC); the Programme Manager (PM) and the General Secretary of the IBPC. Their role is to manage the recruitment process and check that the documents provided by the candidates are appropriate and that candidates are eligible.
- **The LabEx DYNAMO Directory Board (DDB)** is composed of 20 members who represent each of the 7 laboratories of the LabEx DYNAMO). To offer high quality training opportunities for fellows together with the host laboratories, its role will be to define the scope of FP- DYNAMO-PARIS calls by selecting the suitable research themes within the LabEx DYNAMO programme. To ensure a good fit between candidates, their proposed research projects and future supervisors, DDB representatives will also participate with independent experts in the last evaluation step.
- **The Independent International Panel of experts (IPE):** A 9-member IPE (3 experts for each of the 3 research axes of the LabEx) will be chosen by the DDB for each call from a larger 40-person pool recommended by LabEx members, based on their international research reputation and relevance to the 3 LabEx DYNAMO axes. IPE members will be chosen based

on their appropriateness for the specific themes chosen in the call and their willingness/availability to participate in the selection process in a timely manner. All experts will sign a non-conflict of interest statement regarding the candidates, the host research groups/supervisors, and the host institutions. The independent international experts will be solicited by the Programme Management Team, supervised by the coordinator, to review and score applications. The selected experts will be briefed by the PMT on the Code of Conduct for the Recruitment of Researchers and on the specific evaluation procedure and criteria determined by FP-DYNAMO-PARIS.

- **Appeals Board (AB):** Candidates may appeal decisions at any stage of the selection process. A 3-member Appeals Board (AB) will also be selected from the larger 40-person pool of potential referees and be set up independently of the IPE to determine the merits of the appeal. Each AB member will represent one of the LabEx DYNAMO axes, but the appeals decision will be consensual. If the appeal is upheld, the candidate will be re-added to the pool evaluated by the IPE at the next step of the process.

Both IPE and AB panels will be selected before the call is advertised, will be gender balanced and briefed regarding how to avoid unconscious gender bias. A minimum of two-thirds of each panel will be from outside of France. To ensure non-conflict of interest, selected experts for the IPE and AB must not have collaborated with the host laboratory for the previous 3 years.

## Fellows/Researchers’ selection workflow and powers entrusted to the different actors

The FP-DYNAMO-PARIS selection process has five steps.

Selection step	Bodies involved	Actions
<b>Step 1.</b> Verification of Eligibility	<b>PMT</b>	The PMT verifies that applications are complete with all relevant documents. If documents are lacking, the PMT will inform the candidate and request that the missing information be supplied within 48h.
<b>Step 2.</b> Evaluation of candidate CV, references and motivation letter & short list for interview	<b>IPE</b>	The applications of each eligible candidate will be evaluated by 3 IPE experts within the relevant research axis. The IPE will then provide the PMT with a short-list with scores of maximum three candidates to be retained for interview for each open position.
	<b>PMT</b>	Candidates will be informed whether or not they have been short-listed for interview and for which research theme(s) they have been retained, within 2 weeks of the call deadline. Ineligible candidates will also be informed at this stage.
<b>Step 3.</b> Interview and ranking	<b>IPE</b>	Short-listed candidates will be interviewed by the IPE by video-conference. Based on this interview, they will provide the PMT with a scored ranking of the 3 candidates for each research theme in the call.
	<b>PMT</b>	Candidates will be informed of their initial ranking within 1 month of call deadline.
<b>Step 4.</b> Preparation of 3-page project proposal	<b>Supervisor +1 DDB member</b>	Candidates on the short list will be invited to a conference call with the project supervisor and 1 DDB member to define the general scope of the project, the training and the research environment. Candidates will receive identical documents as background reading material for their project proposal and will be given 2 weeks to submit it.

<b>Step 5.</b> Evaluation of project proposals & final selection	<b>1 DDB + 1 IPE per project</b>	Each project proposal will be evaluated by the DDB member from step 4 and one of the IPE experts who evaluated the candidate in steps 2 and 3. The final selection will be made based on the scores obtained at steps 2, 3 and 5. The minimum score must be above 20/40.
	<b>PMT</b>	Based on the scores obtained, the PMT will make a ranking list and inform candidates about the final decision within 2 months of the call deadline. If the selected candidate declines the offer, the next candidates on the waiting list will be approached.

### Evaluation procedure & criteria

At each step of the evaluation process, the experts involved (IPE and DDB) will produce an individual evaluation report scoring each criteria, justified with strong points and weak points. All criteria will have equal weighting in each step of the process, and final scores for each step will be based on a consensus of the individual evaluations of the experts. Consensus meetings will be organised by video-conference and chaired by the Programme Manager, who will not have a vote, but will ensure that each candidate is evaluated fairly, according to the evaluation criteria.

In steps 2 and 3 of the evaluation process (application and interviews), the candidate will be evaluated by IPE members on 4 key criteria. In step 5 of the evaluation process (project proposal), 4 further criteria will be examined. Each criterion will be evaluated on a score of 1 (poor) to 5 (excellent).

If the scores are equal for two candidates in the final ranking, the highest ranking will be given to ensure overall gender balance of the selected fellows. If scores are still equal, the candidates will first be ranked according to the score given for their project proposal and then the score of the interview. In cases where all of these are identical, IPE panel will be asked to select one of the two candidates based on a consensus.

Step	Criteria [1 to 5]	Subcriteria
<b>Application</b> (Step 2)	Scientific excellence	- Quality of CV - Relevant achievements taking into account level of researchers experience (publication, prizes, oral presentation etc)
	Adequacy of research experience for the project	- Relevant work experience - Interdisciplinary or inter-sectoral experience
<b>Interview</b> (Step 3)	Potential of candidate	- Creativity and open-mindedness - Level of autonomy - Communication skills - Leadership abilities
	Familiarity with the project subject area	- Ability to identify clearly relevant research questions
<b>Project proposal</b>	Clarity and ambition	- Quality and novelty of idea - Clarity of objectives and soundness of approach
	Feasibility of the project	- Soundness of approach - Coherence and effectiveness of workplan - Clearly identified risk assessment (mitigation and contingency)
	Added value to host lab research subjects	- Relevance to host lab research programme - Proposed Teamwork - Added value of research questions

	<p>Career development</p> <ul style="list-style-type: none"> <li>- Career ambitions</li> <li>- Impact on personal career development</li> </ul>
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## WHY APPLY

### Quality of the research options offered by the programme in terms of science, interdisciplinarity, intersectorality and level of transnational mobility

FP-DYNAMO-PARIS will be cofunded by the LabEx DYNAMO (90 researchers, 60 technical staff, 20 PhD students, 20 post-docs). The LabEx DYNAMO project is an excellence initiative of the French State that has been evaluated twice by an international jury. Since its creation in 2012, the LabEx DYNAMO has restructured the bioenergetics community in France by bringing together teams from the ENS, the CdF and the IBPC to determine the underlying scientific principles that will provide the bedrock for bioenergy solutions of the future.

**By bridging** membrane biology and bioenergetics, microbiology and genetics, molecular and mathematical modelling, structural and chemical biology, **the LabEx DYNAMO has fostered an unprecedented interdisciplinary effort in basic life sciences research in the centre of Paris.**

The laboratories involved in the FP-DYNAMO-PARIS programme have produced over **400 publications** since 2012 with **20% in high-impact journals (Impact Factor>11)** and a dozen patents and licenses. For the 80 publications with an impact factor >11, over 60% resulted from international collaborations with over 100 international laboratories (>50 from Europe) including some prestigious institutions like the University of Chicago (USA), the University of Cambridge (UK), the Max Planck Institute and the Ludwig Maximilians University Munich (Germany), the National Cancer Institute, NIH (USA), the Icahn School of Medicine at Mount Sinai, New York (USA), the Université de Liège, (Belgium), the Okayama University (Japan); the University of Wisconsin-Madison (USA), the University of British Columbia at Vancouver (Canada). FP-DYNAMO-PARIS ERs will benefit greatly from this world-wide international network of collaborations.

The core reasons for the success of the LabEx DYNAMO are geographic proximity of the teams, the size of its seven founding laboratories (30 to 50 people each) and their inherently interdisciplinary organisation in which the fellows can benefit from the experience of experts in different fields.

ER research opportunities will fall within the three research axes of the Labex DYNAMO shown in Figure below and described in more detail in the next section.

**The FP-DYNAMO-PARIS programme will thus be dedicated to increase our basic understanding of the biogenesis, function and interactions of energy transducing membranes in bacteria and organelles by integrating research on the bioenergetics, structures, dynamics and supramolecular organisation, membranes and membrane proteins, the regulation of the expression of these components and the acclimation of bioenergetic processes to environmental changes.**

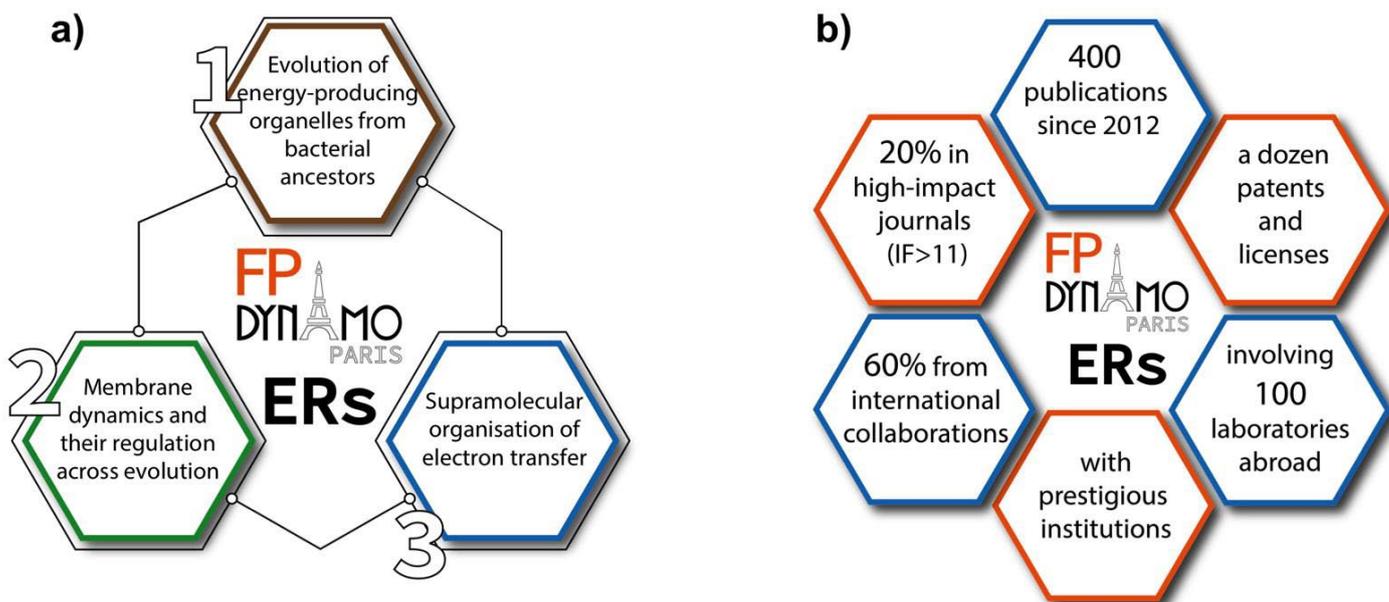


Figure: Working environment of the FP-DYNAMO-PARIS ERs. a) Publication standard to which FP-DYNAMO-PARIS ERs can aspire, b) The three research axes of the LabEx DYNAMO on which FP-DYNAMO-PARIS ERs can chose to work.

## Excellence of the research programme

The goal of the **FP-DYNAMO-PARIS research programme** is an in-depth understanding of the biogenesis of energy-transducing membranes by integrating knowledge from research devoted to the regulation of gene expression, to structural and membrane biology and to bioenergetics. The ERs will have the possibility of developing their research projects in a dynamic scientific environment covering three main research axes: the first axis will study the evolution of energy producing organelles from their bacterial ancestors, not just from the point of view of post-transcriptional gene regulation, but also how endosymbiosis was originally established and how the host and organellar genomes cross-talk to maintain a mutually beneficial relationship. These studies will involve cutting-edge technologies including synthetic biology, microfluidics, and the bioinformatics, visualization, structural biology and mass-spectrometry platforms of the IBPC. Axis 2 will focus on membrane biogenesis, dynamics and regulation in bacteria, chloroplasts and mitochondria. The goal is to study the structures of membrane proteins and their complexes, exploiting our expertise in surfactant chemistry, the structural biology platform, our privileged access to cryo-EM through the CACSICE EquipEx and established collaborations. Axis 3 will centre its activities on the supramolecular organisation of electron transfer chains in energy transducing membranes using multi-scale integrated structural biology approaches, examining biological functions from the cellular to the atomic scale and from the millisecond to nanosecond time scale. This task will increase our global understanding of bioenergetics-related processes, a timely challenge in today's changing environment and urgent need for new innovations in areas related to renewable energy.

**The fundamental objective of FP-DYNAMO-PARIS is to provide excellent, interdisciplinary, and intersectoral training to ERs in these different fields.**

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## Diversity of research options and interdisciplinarity in the host laboratories of the FP-DYNAMO-PARIS programme

The **Laboratory of Theoretical Biochemistry (LBT, IBPC, headed by Dr Marc Baaden)** develops original **structural bioinformatics** methods for **biology and medicine**. A leader in the French high-performance computing community for biological systems with numerous high-impact publications, the LBT is recognised for its capacity to handle large membrane simulation datasets, and its ability to develop original analytical methods and visualization tools.

The **Laboratory of Physical and Chemical Biology of Membrane Proteins (LPCP-PM, IBPC, headed by Dr Bruno Miroux)** brings together **chemists, biochemists and physicists** using interdisciplinary approaches to explore the workings of membrane protein complexes at the atomic level. This provides a unique opportunity for both students and post-docs to work in a fully interdisciplinary context. The laboratory collaborates with the bioinformatics platform and with the LBT to build atomic model systems *in silico* and to design new experiments based on molecular dynamics simulations. The LPCP-PM organises workshops in surfactant chemistry and membrane protein biophysics and biochemistry.

The **Laboratory of Chloroplast Biology and Light Sensing in Microalgae (CBLSM, IBPC, headed by Dr Angela Falciatore)** is dedicated to the study of **light-driven processes** (photosynthesis and photoperception) and **chloroplast biology**. It addresses key questions on the biology, evolution and ecology of microalgae by focusing on different molecular model systems (*Chlamydomonas reinhardtii* and diatoms) and on ecologically relevant phytoplanktonic species that are investigated using **eco-physiology, biophysics, biochemistry, genomics and genetics** approaches. The lab organises a Masters-level practical genetics course called “Solving a scientific enigma” in which ERs will be encouraged to participate, as teachers.

The **Microbial Gene Expression (EGM, IBPC, headed by Dr Ciarán Condon)** laboratory studies how model bacteria (*E. coli*, *B. subtilis* and the photosynthetic Cyanobacterium) and yeast control gene expression at the transcriptional and post-transcriptional levels. The six teams of this unit focus on the production, maturation, structure, translation and elimination of **RNA**. Students and post-doctoral fellows learn how **gene expression** is regulated and has evolved using **genetic, biochemical, and structural approaches**. The lab organises an M1-level practical course in molecular biology called “Immersion in a research laboratory”. The lab also participates in the organisation of an international workshop on isotopic labelling strategies every two years. FP-DYNAMO-PARIS fellows will be encouraged to participate in both of these courses to improve their teaching skills.

The **Laboratory of Eukaryotic Molecular and Cellular Biology (LBMCE, IBPC, headed by Dr Teresa Teixeira)** studies the complexity of interactions between the organelles of single-celled eukaryotes, mainly using budding yeast as a model. They study the means by which mitochondria communicate both with each other and with other cellular compartments. They examine the building of proteins by molecular chaperones. They are also interested in defining how messenger RNA transfers the information encoded in the nucleus to appropriate locations of the cell. Finally, they explore the signalling between the nucleus and organelles through the dynamics of telomeres, also involved in ageing and cancer emergence. The lab provides expertise in **yeast genetics and genomics, molecular and cell biology, crystallography, mathematical modelling of biological systems, microfluidics and optic microscopy**.

The **Chair of Chemistry for Biological Processes (CdF, headed by Pr Marc Fontecave)** studies the biogenesis of quinones, small organic molecules, which play a key role in **electron transfer between electron transfer macromolecular systems**. Marc Fontecave gives chemistry lectures at the Collège de France.

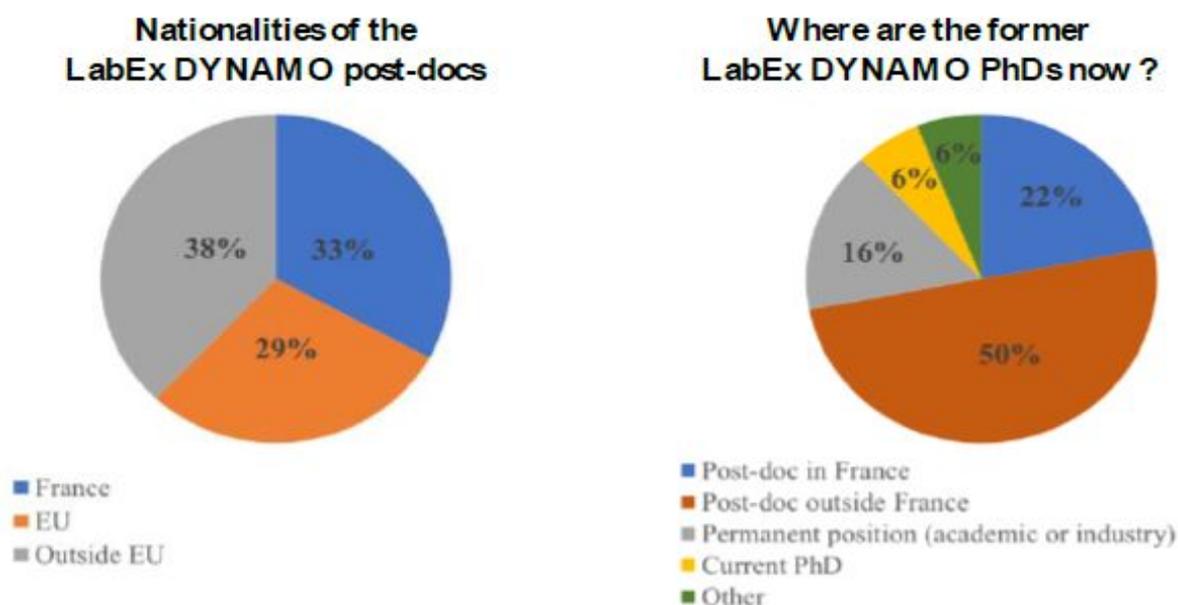
The **Pole of Physical and Biological Chemistry of Living Matter (ENS, headed by Ludovic Julien)** brings expertise in **electrochemistry, in polymer chemistry and colloids** that typically reroute our **biological**

**models**, to develop synthetic processes such as redox chemistry (using electrons from photosynthesis) and formation of microcapsules (by controlling membrane proliferation in cells).

In addition to its five research laboratories, the IBPC has **five technological platforms (Bioinformatics, Mass-Spectrometry, X-ray crystallography, NMR, and a Visualization Wall)** financed by the excellence initiative EquipEx CACSICE. These platforms provide access to the most modern and innovative techniques for research and for training. Dedicated engineers and researchers from the 5 units work together to perform experiments and develop new scientific approaches. The EquipEx CACSICE has also reorganised structural biology in Paris and the LabEx DYNAMO researchers now have privileged access to the platforms of the Pasteur Institute, notably the Titan Krios cryo-electron microscope, the most powerful microscope currently available.

**The FP-DYNAMO-PARIS programme ensures strong international visibility and attractiveness.**

The FP-DYNAMO-PARIS consortium is highly international in its make-up: four of the seven lab directors hail from other European countries (Italy, Portugal, Germany and Ireland), as do several of the PIs (Switzerland, Italy, USA, Austria). This has undoubtedly had a positive impact on the recruitment of foreign students and post-docs and has helped them easily integrate the laboratories of the consortium. Since 2012, the LabEx DYNAMO has recruited more than 41 PhD and post-doctoral fellows, with over 60% coming from abroad. 50% of the LabEx DYNAMO PhD students went abroad for their post-docs in highly recognised laboratories thanks to our international collaboration network. 22% have found a subsequent post-doc position in France and, most importantly, 16% of our alumni have secured a permanent position in academic research labs or in industry (Figure below). The FP-DYNAMO-PARIS programme expands the international attractiveness of the LabEx even further and increases the employability of ERs we have trained through a career plan prepared and adapted to each ER's skills and aspirations.



The LabEx DYNAMO organises international meetings and financially supports meetings where its PIs have a leading position in the steering committee. Since 2012, the LabEx has organised 3 international symposia

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and co-funded 11 seminars, international workshops (in France, Japan, UK, Portugal) and conferences (USA). 68% of speakers at the DYNAMO symposia came from abroad and 32% of these were from outside Europe. **The DYNAMO symposia attracted world-class scientists (Brian Kobilka, 2012 Nobel Prize in chemistry, Stanford University, USA; Susan Gottesman, NIH, Bethesda USA; Werner Kühlbrandt, MPI Frankfurt, Germany; Mei HONG, Cambridge, MA, USA) and provided opportunities to ESRs and ERs to meet these prestigious speakers, to present their work in an international context and thus to increase their visibility<sup>16</sup>. As a direct result of this symposium, one of our LabEx DYNAMO post-docs joined the Kobilka laboratory with a Marie Curie fellowship. The LabEx DYNAMO also provides funds for PhD students and post-docs to attend prestigious meetings or courses. A PhD student was recently funded by DYNAMO to attend Cold Spring Harbor Laboratory Course on Bacterial Genetics, one of the most prestigious and selective in the field.**

### **Intersectorality & actions for ER fellows to support their career and personal development**

**We want FP-DYNAMO-PARIS fellows to aspire to becoming the next generation of leaders in their fields of research, disseminated throughout France or European public or private research organisations. This would continue the IBPC's 90-year-old historical tradition of grooming scientific leaders in Biology, Chemistry, and Physics that went on to create prestigious CNRS laboratories or institutions.**

**The FP-DYNAMO-PARIS programme will offer ERs intersectoral exposure and a solid and integrated framework to develop soft skills. Ethical behaviour, effective communication, skills for team building and management are teachable soft-skills that play an integral role in both research and leadership.**

### **Intersectoral-added values of the FP-DYNAMO-PARIS programme**

ERs will be encouraged to **open their minds** to careers outside of academics by sensitizing them to **entrepreneurship** and **intellectual property rights** by inviting professionals from the private sector to participate in career days to share their experiences. They will provide a better understanding of the career opportunities for scientists in the private sector, and on relationships with this sector, from partnerships to sub-contracting.

**Secondments with SMEs** or visits to industrial partners are also included in the FP-DYNAMO-PARIS programme Besides, **AUNIS PRODUCTION INDUSTRY (API)**, that is a 15-year old company specialized in the field of precision machining and assembly of mechanical sub-assemblies, in aeronautical precision mechanics, in the machining of railway parts, in the manufacture of parts for medical devices, in the design and machining of parts for food production lines and the oil industry, and in scientific instrumentation generally, **will contribute financially** to FP-DYNAMO-PARIS with a two-year full-time ER contract.

FP-DYNAMO-PARIS ER fellows will also benefit from the **Foundation Edmond de Rothschild's** support for the development of scientific research at the IBPC. Created in 1930 by the Baron Edmond de Rothschild and Jean Perrin, the foundation currently owns the IBPC building and hosts five of the seven FP-DYNAMO-PARIS laboratories. The foundation awards the Nine Choucroun prize and funds an international lecture every year. Headed by Prof Alain Fisher, the foundation provides short term bridging contracts for young researchers

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waiting to start new long-term positions. Alain Fischer, a forerunner in the field of human genetic therapy in France, and president of the foundation will train FP-DYNAMO-PARIS fellows on **ethics in science**.

**ERs will have the opportunity to** build and be part of a young researchers' association (YRA) **through the creation of an association of Masters, PhD students, and post-doctoral fellows of LabEx DYNAMO laboratory members that will be hosted at the IBPC. The association will organise scientific meetings with dedicated time for the speakers to interact with the public, participate in journal clubs, social events (dinners, escape games, sporting events...). The association will be connected to other YRAs from FP-DYNAMO-PARIS partner institutions at the Collège de France (ChaDoC17) and research institutes in Ile-de-France region (YOUR-I2BC18). Meeting with other COFUND projects in Paris will be encouraged and a list of LabEx DYNAMO alumni will be provided to the association for networking. The YRA will also participate in the organisation of the FP-DYNAMO-PARIS retreat in Padua and co-organise the week-long internal scientific meeting of the IBPC with the IBPC staff delegates, held every two years. The LabEx DYNAMO will use its governance and scientific animation budget to contribute to 5K€/year to the YRA budget.**

### **Complementary soft skills for promising future career opportunities**

**Scientific knowledge and technical skills are necessary for high-level performance but are not enough. Recruiters stress the importance of soft skills, including communication and social skills. While these are often personality traits, they are also skills that can be learned and honed through training and practice. In the workplace, these soft skills are in demand by all professions, in all sectors of activity. They make a major difference in hiring decisions, they can contribute to start-up success, and they can promote career development and improved salary negotiation abilities.**

**Specific training will be proposed to ERs that focuses on knowing oneself and others, emotional intelligence, project management and team cooperation, listening and communication in a team, conflict management, creativity and innovation, efficiency, time management, public speaking, civic engagement and leadership. This will be refined through attendance of the EMBO course on "Laboratory Leadership for Postdocs" to be included in the retreat in Padua, and involvement in dedicated complementary soft skill training events.**

**Today, in both the academic and non-academic sectors, projects are led by multidisciplinary teams where each brings their specific skillset. Working in an interdisciplinary and international environment will help ERs learn to cooperate effectively and quickly, with colleagues from a wide variety of backgrounds, professions, and cultures. This will enable ERs to appreciate how much complementarity contributes to overall performance in collaborative work.**

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## Supporting balanced individual development for sound research

The FR-DYNAMO-PARIS programme will **stimulate initiatives to improve the quality of life of ERs and their personal development at work**. Weekly activities, such as choir practice and yoga have already been up and running for some time at the IBPC and are open to everyone. ERs will also have a privileged access to the sports association of the Ministry of Research, a few steps away from the labs. New initiatives are envisaged (theatre group, music, artistic exhibitions) and new proposals from the YRA will be welcomed.

**Learning soft-skills will have a strong impact on FP-DYNAMO-PARIS ER development, not only on their accomplishments as scientists, but also on their career development and personal achievements.**

### Supervisors' qualification and experience

All principle investigators (PIs) of the LabEx DYNAMO have a great deal of experience in ESR and ER training. They have a Habilitation diploma or equivalent qualification from their research institutes or universities. They all have an excellent international academic track record and professional experience either in foreign laboratories or in the private sector. All have international collaborations, which will provide networking opportunities to the ER fellows they will mentor. Supervisors regularly participate in CNRS, University and EMBO management training courses such as: "Managing a team, Organising and prioritising your time, Recruitment and lab communication, Handling of psycho-sociological risks ...), to improve their supervisory skills.

### Mentoring programme to support career development

PIs will secure the necessary means (funding, equipment, access to strain libraries and/or data) for ERs to carry out their research. They will meet with ERs on a regular basis to discuss both their day-to-day activities, and their longer terms prospects related to the project. The supervisors will also advise ERs on their career plans and provide practical tips on how best to go about securing jobs in the public and private sectors.

The FP-DYNAMO-PARIS mentoring programme will include:

- **Integration arrival day.** On the day of arrival, supervisors will introduce ER fellows to their research groups, to collaborators and other group leaders, administration staff, and the head of the YRA. ER fellows will receive a **welcome booklet** containing all the relevant information about the everyday life in the laboratory, safety procedures and social activities.
- **Scientific mentoring. Regular meetings** will be held with ERs, either alone or together with students and technical staff involved in the project, where ERs will present their data, its analysis and conclusions. When large data sets are involved, *e.g.* from the IBPC or external platforms, the scientific platform manager will provide the ER fellow with detailed tutorials on data management and analysis procedures. Collective data analysis will help define the next step of the project and a large degree of freedom will be given to ERs to stimulate their creativity and increase their autonomy and self-confidence. ERs will be involved in supervision of Masters and PhD students of the team where possible.
- **Mentoring on dissemination of results.** In addition to group meetings, **ERs will present their results** at least once per year in an **internal seminar** to the whole laboratory or institute, and at the FP-DYNAMO-PARIS retreat in Padua. ERs will be encouraged to organise informal discussion groups, together with the other ESR and ER fellows of the LabEx, to promote their communication skills.
- **Mentoring on publication and grant writing.** Supervisors will support ERs participation in manuscript elaboration and writing (organisation of the manuscript, writing the first draft, critical discussions). Supervisors will also initiate FP-DYNAMO-PARIS ERs on how to write individual fellowship applications for the next step of their careers. Training on how to apply for competitive grants or fellowships will be provided by experienced researchers and industrial partners.

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- **Complementary skill plan.** A month later after their arrival, ERs will meet with the PC to check on their integration into their new working, living and administrative environments. During this meeting, a **Complementary Skill Plan (CSP)**, based on a strength/weakness analysis and on the long-term objectives of ERs, will be set up for the next two years to help prepare ERs for the next step of their careers. Depending on the orientation of the CSP, the supervisor will be asked to adjust their mentoring focus and help the ER fellow find the appropriate tools and contacts to achieve their CSP. Meetings will take place every six months to check on progress.

- **Personal Career Development Plan (PCDP).** ERs will be assisted by their supervisors in advancing their career projects, and in developing and implementing a plan of action. The supervisor will give advice on the key factors leading to a successful career. The fellow will also have the opportunity to choose a mentor from industry and associations participating in FP-DYNAMO-PARIS.

- **Mentoring related to leadership and gender issues.** We strongly adhere to EU policy on gender equality, particularly in this phase of one's research career that is determinant for future job opportunities in both academia and the private sector. Beyond ensuring equal gender opportunity in the selection procedure, we aim to provide a mentoring programme tailored to leadership and gender issues. Each organisation committee (*e.g.* for the retreat in Padua, see letter 5.3 and the LabEx DYNAMO Symposium) and the associated programme will be gender balanced. We will invite associations such as the European Platform for Women Scientists to animate sessions during career days, the Padua retreat and the DYNAMO meeting to discuss leadership and gender issues. These actions will help FP-DYNAMO-PARIS ERs prepare for management positions regardless of gender and to apply gender equality principles in their future roles as leaders.

FP-DYNAMO-PARIS's training programme will prepare ERs to successfully enter the increasingly competitive labour market.

## Training in scientific and technical methods

We will train ERs in the field of energy conversion using interdisciplinary and quantitative approaches. From gene expression and genome organization to the final assembly of the macromolecular photosynthetic complex, FP-DYNAMO-PARIS ERs will explore the energy conversion machinery developed by microorganisms throughout evolution. FP-DYNAMO ERs will be trained in state-of-the-art techniques and will acquire expertise in genomics, genetics, photobiology, biophysics, biochemistry, structural biology, and learn how to synthesise new materials and equipment needed for research in the bioenergy field .

In their host laboratories, ERs will be trained to design hypothesis-driven, appropriately controlled experiments with a critical evaluation of scientific data to plan the next experimental step. They will have access to CNRS training courses, including mandatory safety training for working in a laboratory. ERs will also be trained by researchers and platform managers in cutting-edge technical approaches available through the Labex DYNAMO, the EquipEx CACSICE and national and European infrastructures, such as the ESRF Synchrotron, when appropriate for their scientific projects and/or career development plans. FP-DYNAMO-PARIS partners will also offer specific training to ERs. For instance, **CYTIVA EUROPE** a leader in the development of chromatographic technologies for the purification of biological macromolecules, will organise a series of lectures and on-site tailor-made workshops for FP-DYNAMO-PARIS ERs. **BMG LABTECH FRANCE**, a leading global manufacturer of innovative micro-plate readers that has developed applications in microbiology, molecular biology, biochemistry, cell-growth and signalling, will organise on-site lectures and personalised workshops in spectroscopy, fluorescence anisotropy, luminescence, time resolved FRET technologies and its applications to enzymology, protein-protein interactions, cell growth and ligand screening. **LEXMA Technology** is a high-tech start-up that aims to revolutionise multi-scale and multi-physics applications to improve and accelerate the development and discovery of complex biological systems in collaboration with the LBT. LEXMA Technology will support the training of ERs in High Performance

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Computing (HPC) for (bio)-fluid systems, with full exposure to the concepts and implementation of HPC algorithms. **API** will support advanced training in precision machining.

#### **Training for communication of results at scientific meetings and conferences**

The DYNAMO laboratories regularly organise visits and seminars given by internationally renowned speakers during which students and postdocs have a privileged access to brilliant scientists, including female role models (e.g. the Nobel Prize **Elisabeth Blackburn** or the Breakthrough Prize in Life Sciences **Titia de Lange**). These seminars are widely advertised among DYNAMO labs, ensuring that ERs can participate in scientific discussions outside of their immediate field, to practice interdisciplinarity and build their networks.

ERs will also participate in internal lab-wide scientific seminars, where they will be able to present the details of their work to researchers of partner institutions in a highly specialised environment.

Both the ER's and host laboratory's visibility will be reinforced by fellows presenting their work (in the form of talks or posters) alongside their colleagues at international conferences. These events will also give ERs critical opportunities for networking. The following conferences and meetings are good targets for ERs: Congrès du Groupe Français de Bioénergétique (CAES Oléron), Gordon research conferences (Europe/USA), EBEC (Europe), the DYNAMO symposium (Paris), Cold Spring Harbor Meetings, FASEB Conferences, Keystone Meetings, EMBO meetings, and the RNA meeting. These meetings are regularly attended by and co-organised by DYNAMO members.

### **Interdisciplinary training through secondments and short visits**

ERs will have opportunities to profit from secondments or short visits with external DYNAMO academic collaborators to establish new collaborations or to have access to material, methods, technical help and instrumentation that are not already available in the host labs. ERs will be offered secondments and/or short visits to the private sector partners of FP-DYNAMO-PARIS, based on existing scientific collaborations. These partners will also be involved in the career days organised for the ERs to stimulate scientific networking for careers. Within the consortium, a generic e-mail address [dynamo@ibpc.fr](mailto:dynamo@ibpc.fr) will be set-up for anyone requesting material or methods within the consortium, expanding an existing system at the IBPC ([ibpc@ibpc.fr](mailto:ibpc@ibpc.fr)). The YRA will also have an opportunity to interact with several research communities through recognised French Research Groups that often meet at the IBPC.

#### **Going beyond pure science through network wide events**

The FP-DYNAMO-PARIS project involves a series of courses and training events dedicated specifically to help fellows further develop the critical skills required for successful careers that go far beyond the pure research environment (science-based entrepreneurship, collaborations with the private sector to push their results from science to marketable technology). An initial evaluation of the skillset of fellows, together with the career development expectations they have expressed during the recruitment process, will allow us to propose more **personalised courses and experiences appropriate for individual needs**, in terms of both scientific and soft-skill oriented courses.

The experience of each fellow will be taken into consideration to encourage them to share their previous successes or shortcomings with their colleagues and to involve them in these events to **learn from each other** on how to improve.

The focus of these courses will be to train fellows in how to successfully manage their careers, to showcase the management and administrative skills required for scientists and to give them the tools to successfully transition to the roles expected of senior researchers, private sector R&D specialists and entrepreneurs. These courses will involve both our laboratories and industrial partners of FP-DYNAMO-PARIS.

In addition to the courses provided on career days, we intend to promote LabEx-wide events and training sessions (see table 3), involving the majority, if not all ER fellows. The goals of these events will include:

- Promoting networking among ERs and partner laboratories;

Reinforcing ER proficiency in the additional (soft) skills required for the research environment; Providing ERs with an opportunity to meet distinguished researchers such as Pierre Joliot, grandson of Marie Curie, and still an active researcher at the IBPC and other members of the French Academy of Sciences such as Dr Francis-André Wollman and Mathias Springer. They will share their unique perspectives on research based on their illustrious careers.

Our international alumni network, which covers a broad spectrum of professions, will also be involved in the ER mentoring scheme. They will participate in the COFUND career day, where COFUND fellows from the Paris area will present their scientific results and meet industrial and academic partner organisations, to allow them to integrate a growing network of COFUND fellows.

Network wide training Events & Conferences	Duration (days)	Lead Institution	Training content	Date
<b>Interdisciplinary and intersectoral training within the consortium</b>				
Welcome day	1	FP-DYNAMO-PARIS partners	Settling-in information	M8 (1 <sup>st</sup> call) / M12 (2 <sup>nd</sup> call)
FP-DYNAMO-PARIS retreat	5	University of Padua Italy	Scientific and CSP meeting	M16-M22
Career days	2	FP-DYNAMO-PARIS partners	Enterprise & Foundations Forum	M25-29
IBPC open days	2	IBPC	Dissemination of science to public	M10
COFUND day	1	FP-DYNAMO-PARIS	COFUND Networking and Entrepreneurship training	M24
The LabEx Dynamo Symposium	3	LabEx DYNAMO	Organizing an international conference	M35-36

A **Welcome day** will be organised at the IBPC for each ER group. The welcome day will allow the ERs to meet each other, the students, post-docs and researchers of the LabEx DYNAMO and FP-DYNAMO-PARIS partners, and more generally to visit the platforms and meet the platform managers. ERs will also be briefed on practical information on settling in the Paris area. The **Association Bernard Gregory** a non-profit organisation and a Euraxess Career Development Centre, will organise a workshop on “**defining a personal career plan that looks like me**”, to help ERs understand the importance of a professional project for their career development, to take a step back from their backgrounds and research experiences to define a professional project consistent with their aspirations, to state their desires and motivations for developing career opportunities and to accompany them through their international mobility.

**FP-DYNAMO-PARIS will organise a retreat for all ER fellows in conjunction**, with the Biology Department of Padova University DiBio at the historical Botanical Garden in Padua **during M16-M22**. The scientific objectives of research in DiBio include modern biology from molecules to organisms and ecosystems, from an evolutionary perspective. DiBio offers a wide choice of programmes in Biology, Molecular and Biomedical Biology, Biotechnology, Natural Sciences as well as Marine and Evolutionary Biology, and a PhD Programme in Biosciences. DiBio will participate in the mentoring of ERs, host secondments and/or collaborate on research projects on solar energy conversion, synthetic biology and bioinformatics.

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DiBio will also provide the logistics and help the FP-DYNAMO-PARIS in the organisation of the joint retreat between the FP-DYNAMO-PARIS COFUND fellows and fellows of University of Padova. This retreat will involve both poster preparation and talks with feedback. During this retreat, **EMBO Solutions GmbH** (an independent, non-profit daughter company of EMBO) will organise a **three-day course on "Laboratory Leadership for Postdocs"** (see programme20). The objective of this course is to prepare ER fellows to be future leaders in academia or industry. It will help hone their skills in leadership and management, improve the quality of their research and the well-being of their future teams.

**Career days** will be organised during M29, where professionals from the private sector, foundations, the Association for Women in Science and Labex DYNAMO alumni will be present. These days will provide exceptional opportunities to ERs to **open their minds to different career opportunities** and participate in a meet-and-greet type fair to connect them to the industrial sphere. Representative of FP-DYNAMO-PARIS partners such as **AIR LIQUIDE, API, LEXMA, PALE BLUE and SANOFI** will present their organisation and discuss their experiences, research strategies, competition, prototype development, diffusion and advertising scientific instrumentation, and fund-raising strategies of their companies. **Tara Ocean** will present the perspective of **career development in environmental research**, explain the major environmental challenges in the field of marine biology, and what is needed from scientists. Alain Fischer, head of the Fondation Edmond de Rothschild, will give a lecture to ERs on **Ethics in Science**. We will invite representatives of EPWS to give a conference on the place of women in Science. Pierre Joliot will share his unique perspective as a member of a great family dynasty of scientists on the evolution of science in France. A special course on **intellectual property (IP) and valorisation** will be given by the 'Service Partenariat et Valorisation' (SPV) of the CNRS, and include a presentation on the importance of IP law and its effects on both public and private research efforts, IP strategies and how to put them in place.

**IBPC open days** are biannual events where laboratories present their research to a non-scientific audience. ERs will be involved in the organisation of these days at different levels including communication, fund-raising and animation of workshops. This event will train ERs to communicate simply and effectively to a different audience than usual and to work with a team of volunteers to achieve the same non-scientific goals.

**COFUND day** at M24 is a meeting with two other COFUND programmes on our campus (**EuReCa and Up-to-Paris**). It will be a unique occasion for fellows to network with other COFUND ERs and ESRs, to share their experience and to benefit from a PSL-Pépité training course **PSL-Pépité is a student centre for innovation, intellectual property transfer and entrepreneurship** of the PSL University, partner of the three COFUND projects. ERs will be trained to formulate a business plan and to measure the challenges and benefits of creating their own company. **Serious team games** on managing one's technological companies through the first years, from funding to profit, will be co-organised by the three COFUND programmes if ESRs and ERs are interested.

**The LabEx DYNAMO symposium** will be organized by the FP-DYNAMO-PARIS ERs with the support of the DDB. This will provide the FP-DYNAMO ERs with an invaluable experience in conference organisation that will be important for the future development of their career. FP-DYNAMO ERs will be invited to present their results during this conference by oral or poster presentations.

#### **Acquiring other complementary skills expected from senior researchers**

All ER fellows attend mandatory courses organised by the CNRS on chemical, biological and radioactive risk management shortly after their arrival. We also intend to provide several other courses on career development, once the fellows from both calls are well integrated into their labs. These courses will be organised in optional modules and structured in a way that allows them to occur in parallel if possible, according to popularity. Some of the training events will be organised internally by partner laboratories or public structures (CNRS/University). ERs will choose a set of transferable skill training courses presented in Table 4, based on their CSPs and PCDPs.

#	Training module	Days	Purposes	Partners involved
1	Effective communication I	3	<b>Adapt your communication to the profile of your audience</b> <ul style="list-style-type: none"> <li>Better understand how yourself and others function, to develop a mutually beneficial relationship between yourself and your audience</li> <li>Adapt your communication to the profile of your audience to strengthen the effectiveness of the relationship</li> <li>Anticipate and manage stressful behaviour to restore effective communication in tense situations</li> </ul>	CNRS
2	Effective communication	2	<b>Practice public speaking</b> <ul style="list-style-type: none"> <li>Present and structure your ideas according to the objective</li> </ul>	CNRS

	II		<p>pursued</p> <ul style="list-style-type: none"> <li>Exchange with ease</li> <li>Gain clarity in your oral communication</li> <li>Engage, surprise and conquer your audience</li> <li>Take the place of speaker</li> <li>How to communicate clearly with impact about your research project and its outcomes to a non-expert audience?</li> </ul>	
3	Emotional Intelligence	2	<b>Using emotional intelligence to manage better</b> <ul style="list-style-type: none"> <li>Develop your emotional competence as a manager</li> <li>Identify your emotions and those of your employees</li> <li>Maintain control of your emotions in a delicate or stressful situation</li> </ul>	CNRS
4	Management	2	<b>Manage an intergenerational team</b> <ul style="list-style-type: none"> <li>Identify and understand the differences between generations</li> <li>Adapt your management to different generations to set up collaborative work in an intergenerational team</li> <li>Capitalize on the strengths of each generation to advance the collective</li> </ul>	CNRS
5	Conflicts	2	<b>Prevent and resolve conflicts</b> <ul style="list-style-type: none"> <li>Lead your team in a spirit of compassion to prevent conflicts</li> <li>Identify and analyse the origins of conflict situations</li> <li>Building constructive relationships</li> <li>Know and appropriate the tools necessary to prevent and resolve conflicts</li> </ul>	CNRS
6	Stress	2	<b>Managers: manage your stress</b> <ul style="list-style-type: none"> <li>Understand the mechanisms of stress to better control it</li> <li>Recognise the signs and symptoms of stress</li> <li>Appropriate the tools to reduce your daily stress</li> </ul>	CNRS

7	Funding and interviews	2	<p><b>The different sources of Funding</b></p> <ul style="list-style-type: none"> <li>Public grants or partnerships with private companies, how to choose between each depending on your situation</li> <li>Defining a budget for your project, how much will be needed, how much should be requested</li> </ul> <p><b>Successfully apply for a grant</b></p> <ul style="list-style-type: none"> <li>The common sections for most proposals, what should always be known before applying for funding</li> <li>Applying for EU money, how to do it, when, and which programme suits your work? Preparation of interviews</li> <li>Building a winning consortium, finding the right partners to answer the needs of the funding agency</li> </ul>	Alumni, ERC/EMBO-YI, grant reviewers from the LabEx DYNAMO, SPV from CNRS
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## Enhancing the potential and future career prospects of researchers; strengthening human resources at the regional, national or international level

### Developing the qualities needed for successful research careers

FP-DYNAMO-PARIS ERs will have the opportunity to contribute to far-reaching research objectives with high impact publications and career development opportunities. Our training programme is designed to provide ERs with interdisciplinary scientific knowledge and practical expertise in a stimulating interdisciplinary, intersectoral and international environment. ERs will develop independent thinking, plan ahead on their research, take

initiatives, seek expertise, and troubleshoot their project if needed. ERs will be fully competent to get jobs in academia (in the fields of genome structure and gene expression, evolution, electron transfer and photosynthesis, membrane biogenesis, photochemistry, and structural biology), and the possibility to switch to the private sector in the domain of bioenergy, new biomaterials, development of new surfactants, process optimisation, genome optimisation and synthetic biology, to name just a few. They will learn to critically evaluate data and identify opportunities to protect intellectual property. They will be familiar with working in a gender-balanced scientific and leadership environment (the IBPC Board of Direction is gender balanced 50-50 in its leadership positions).

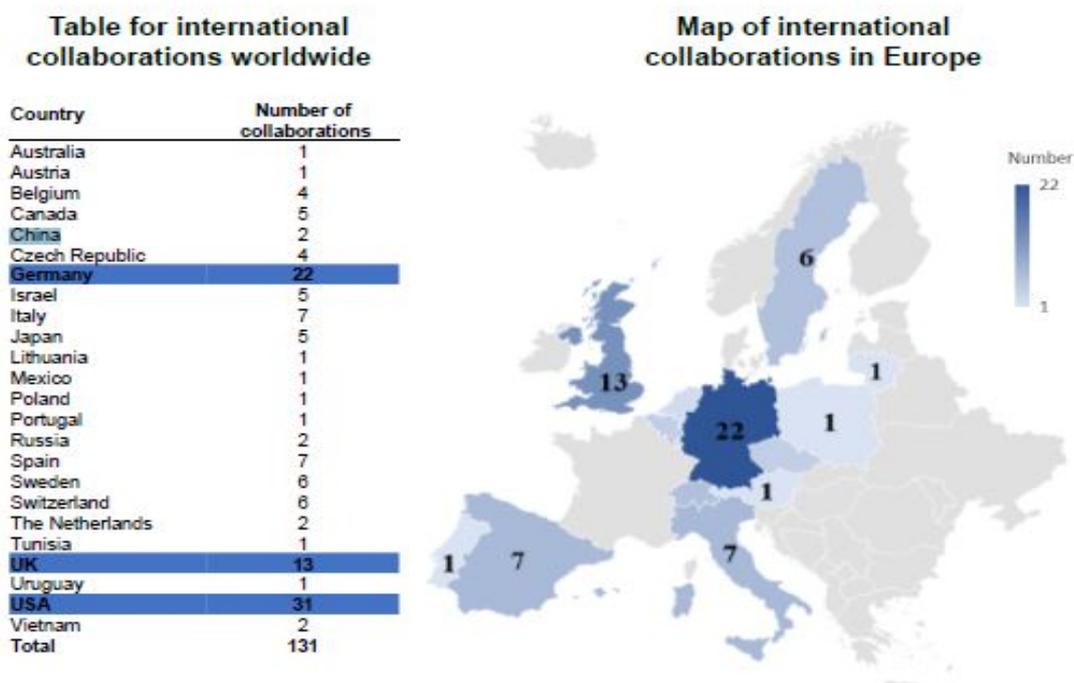
**Enhanced interdisciplinary knowledge.** FP-DYNAMO-PARIS fellows will have access to a large panel of techniques thanks to the inherently interdisciplinary nature of the consortium. Our unified philosophy is that fundamental questions in biology cannot be answered by a single discipline, and thus fellows will benefit from this opportunity to broaden their training, with a focus on creativity and broad-mindedness.

This philosophy appears in the structure of the IBPC itself, host to the majority of FP-DYNAMO-PARIS partners, and which was created from day one as an interdisciplinary entity – the first of its kind in France. This visionary organisation remains the core spirit of the various institutions participating in the FP-DYNAMO-PARIS programme.

There is a general need for experienced researchers and scientists within the European Union both in academia and in industry. Fellows will have shown their ability to work on highly complex and interdisciplinary subjects and that they are well proficient in problem solving, highly sought-after capabilities in industrial R&D and management positions.

**International networking in research and education:** The international network provided by the LabEx DYNAMO together with the international conferences and workshops that ERs can attend provides an opportunity for contact with international scientists. This will be further strengthened by international collaborations and visits to foreign institutions. In these ways, ERs will expand their professional networks, sharpen their critical thinking and broaden their understanding of the international academic labour market. International secondments and short visits provide opportunities to extend this international network to the private sector (see letters of support from Jena Bioscience in Germany, UCB in UK, PaleBlue in Norway and

Lexma in Italy). Fellows will benefit from our network of international alumni and a community of excellence, which will serve as a basis for future professional collaborations. Through these structures, it is expected that at the end of their stay within their host institutions, ERs will have a strong network of international contacts in research and sufficient knowledge about foreign institutions and companies to facilitate their next step into academic or private sector careers (Figure below).



**Enhanced scientific competitiveness and solid career support network.** In addition to being trained to work in an interdisciplinary environment, FP-DYNAMO-PARIS fellows will learn how to apply for competitive positions in France (CNRS, ATIPE-Avenir...), how to write competitive grants (ANR Young Researcher, ERC Starting Grants, Marie-Curie initiatives...), and how to prepare for the interview in the case of the ERC SG. This will constitute a strong experience for the future development of their careers, both in France (30% of CNRS researchers are non-French citizens) and abroad. Fellows from this programme will be experienced ad working in international environments, which will increase their flexibility in their future careers. Through their PCDPs, ERs will be encouraged to devote time to reflecting on their career projects and discussing them with their advisors. This is key to improving their awareness of the key factors leading to a successful career. Confidence through intersectoral mobility. **Through contacts with industry and research foundations and from interactions at workshops and other network-wide activities, ERs will gain an understanding of the skills required to work at the interface between science and industry, developing their creativity and their innovative and entrepreneurial mind-sets. Through structured planning of their research and participation in the organisation of the network-wide training events, ERS will have perfected their project management skills. The training received in complementary skills will prepare fellows for work outside of academia, as skills such as the concise presentation of complex data, the ability to work in more than one language, cross-cultural awareness, time management, report writing, grant proposal writing (similar to the bidding processes in industry) are independent of the area in which they are used. Close contacts with SMEs and the PSL-Pépité initiative, together with the career days, will demonstrate to ERs the possibility of an entrepreneurship adventure starting from academic research.**



## Strengthening research human resources on regional, national or international level

**Impact on industry partners.** The intersectoral nature of our project will further boost the competitiveness and innovation potential of collaborating companies, mutually benefiting both researchers and industries. Several of our international collaborations are linked with industry, such as the development of new polymers for electron microscopy analysis of membrane proteins, with an academic group at Leeds University and a pharmaceutical company. Jena Bioscience is interested in marketing these polymers and in licencing the forthcoming patent. Aunis Production Industrielle (API) is interested in marketing new scientific instrumentation for the photosynthesis scientific community. A regular screening of the research projects will identify potential industrial interest and partners. This will pave the way for new collaborations and the creation of spin-offs.

Impact at the regional, national and European level. **The FP-DYNAMO-PARIS programme will enhance cooperation between multidisciplinary institutes and industries throughout France, Europe and beyond, and substantially improve training programmes. We anticipate that a number of FP-DYNAMO-PARIS ERs will succeed in getting permanent CNRS or University positions and contribute to the reputation of scientific excellence emanating from France and Europe through long and illustrious careers, just like many of their predecessors at the IBPC, ENS and CdF.**

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