MSCA Postdoctoral Fellowships

Prof. Diana Massai
Prof. Diego Gallo

Politecnico di Torino

Diego Gallo

2008 MSc in Biomedical Engineering @Politecnico di Torino
(Thesis topic: computational cardiovascular fluid dynamics)

2009-2011 PhD in Biomedical Engineering @Politecnico di Torino
(Thesis topic: computational cardiovascular fluid dynamics)

2012-2015 Postdoc involved in several research projects
(Main topic: cardiovascular fluid dynamics)

***2014/2015* MSCA Individual Fellowship proposal writing/winner**
(Topic: Ageing effects on aorta)

***2015-2016* MSCA IF @University of Toronto (Canada)**

End of 2016 Assistant Professor of Industrial Bioengineering @Politecnico di Torino

End of 2019 Associate Professor of Industrial Bioengineering @Politecnico di Torino

Diana Massai

2006 MSc in Nuclear Engineering @Politecnico di Torino
(Thesis topic: Simulations of hadron beams for radiotherapy)

2007-2010 PhD in Biomedical Engineering @Politecnico di Torino
(Thesis topic: computational cardiovascular fluid dynamics)

2010-2015 Postdoc involved in several research projects
(Main topic: development of bioreactors for tissue engineering)

***2014/2015* MSCA Individual Fellowship proposal writing/winner**
(Topic: Novel bioreactor for stem cell expansion)

***2015-2017* MSCA IF @Hannover Medical School (Germany)**

End of 2017 Assistant Professor of Industrial Bioengineering @Politecnico di Torino

End of 2020 Associate Professor of Industrial Bioengineering @Politecnico di Torino

diana.massai@polito.it
diego.gallo@polito.it

Who can apply?

- PhD degree at the time of the deadline
- <8 years experience in research, from the date of the award of their PhD
- You have not resided or carried out your main activity (work, studies, etc.) in the country of the beneficiary for more than 12 months in the 36 months immediately before the call deadline
- Resubmission restrictions (previous year: score below 70%)

Seals of Excellence will be awarded to applications with a total score >=85%, but which cannot be funded due to lack of budget

diana.massai@polito.it
diego.gallo@polito.it

Marie Skłodowska-Curie Actions

Tip #1
read the documentation!

Broad lines of activities:

1. Fostering new skills by means of excellent training of researchers
2. Nurturing excellence by means of cross-border and cross-sector mobility

https://cordis.europa.eu/programme/id/H2020-EU.1.3.

diana.massai@polito.it
diego.gallo@polito.it

Types of fellowships

There are 2 types of fellowships:

Tip #2
Host organization is key
Tip #3
Research office can help

1. European Postdoctoral Fellowships: within Europe. Between 1 and 2 years. For researchers of any nationality
2. Global Postdoctoral Fellowships: 1 to 2 years in a non-associated Third Country + a mandatory return phase of 1 year in a Horizon Europe Associated Country. Only nationals or long-term residents of Horizon Europe Associated Countries

https://marie-sklodowska-curie-actions.ec.europa.eu/actions/postdoctoral-fellowships

diana.massai@polito.it
diego.gallo@polito.it

What do they cover?

The fellowship provides:

Tip #4
Do your math

- a living allowance
- a mobility allowance
- if applicable, family, long-term leave and special needs allowances
- funding for research, training and networking activities
- funding for management and indirect costs

https://marie-sklodowska-curie-actions.ec.europa.eu/actions/postdoctoral-fellowships

Application guidelines

Tip #5

Follow the guidelines exactly:
The Answer is in the Question itself

For example:

"*objectives achievable* […] *measurable* […] *verifiable*"

Then:

- Explain why you are confident that the objectives are achievable (e.g.: preliminary data, proof-of-concept)!
- Include measurable keypoints!

https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/af/af_he-msca-pf_en.pdf

diana.massai@polito.it
diego.gallo@polito.it

Research proposal

Any research field or discipline!

Tip #6

Check the repository of funded projects on the CORDIS website

- However: opt for different research problems/activities than your current or previous ones. The fellowship aims to diversify researcher´s skills and to help them to acquire new knowledge

- 10 pages: how long does it take? Reserve at least 4 months!
  1. Find a supervisor: 0.5-1 month
  2. Conceive/discuss/plan the proposal: 1-1.5 month
  3. Writing & reviewing: 2 months

Tip #7

Start early! ~ spring

diana.massai@polito.it
diego.gallo@polito.it

Research proposal (not only…)

You will submit your CV:

- Underline the potential to reach or re-enforce professional maturity/independence during the fellowship

- The assessment of the researcher is done in relation to their level of experience

Tip #8

CV: not only journal articles!

Tip #9

Why you?

diana.massai@polito.it
diego.gallo@polito.it

Let's write!

Put yourself in the shoes of reviewers!

Tip #10
Keep it simple!

One day I will find the right words, and they will be simple - Jack Kerouac

Reviewers will evaluate ~15 proposals in 3 weeks about complicated subjects that lie outside their own fields of expertise, while juggling their own research:

- Be organized and logical
- Write in clear concise language

Tip #11
"Educate" the reviewer

Tip #12
Share for feedback!

diana.massai@polito.it
diego.gallo@polito.it

How evaluation works

Check the evaluation criteria in the call documentation!

- Each proposal is evaluated by 3 independent experts
- Experts are matched using the keywords you choose for your proposal
- Each proposal receive an Evaluation Summary Report
- Rejections come with feedback: pay attention to strengthen future proposals!

Tip #13

Feedbacks are learning experiences

diana.massai@polito.it
diego.gallo@polito.it

How evaluation works

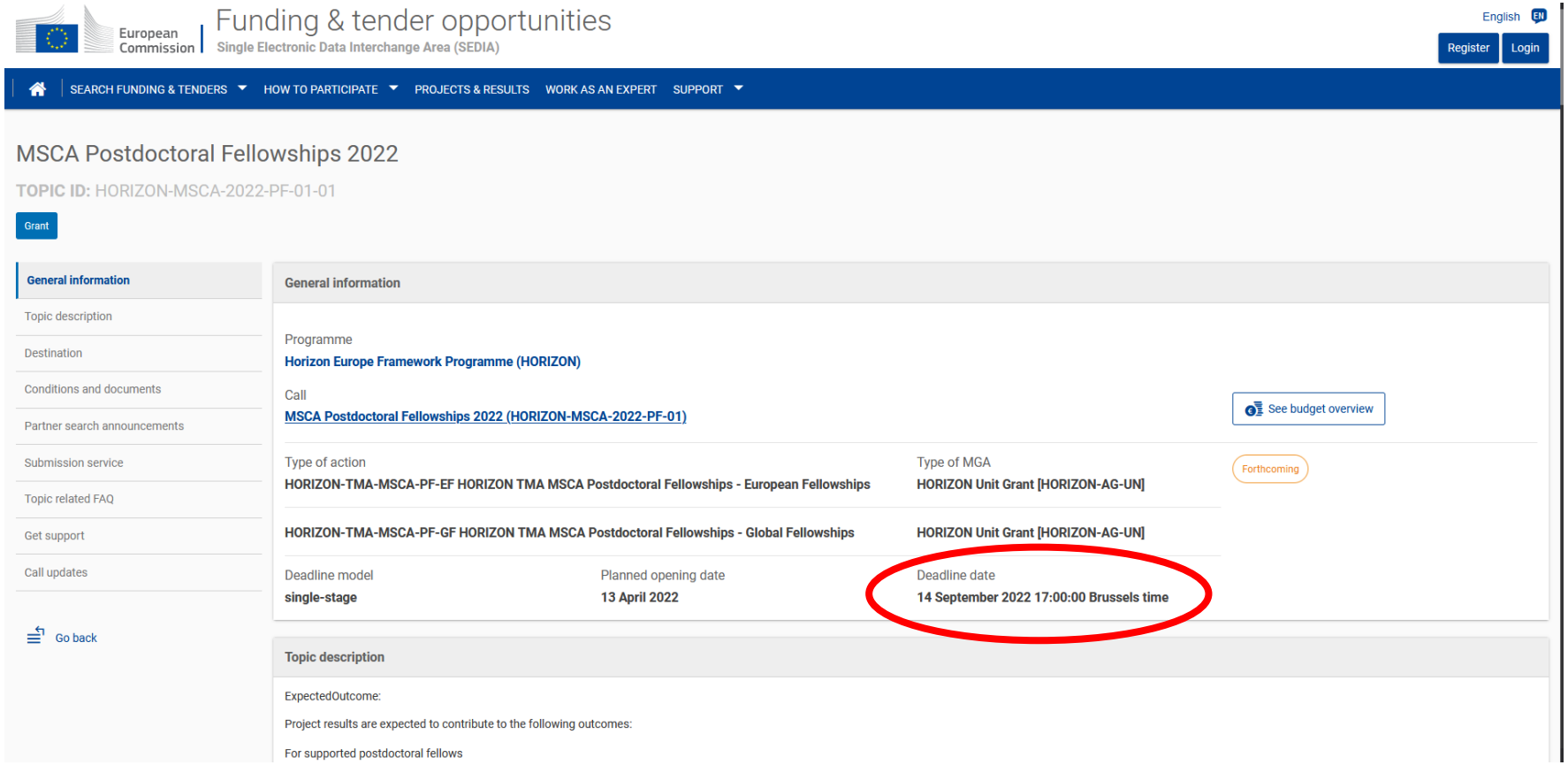
Excellence 50%	Impact 30%	Implementation 20%
Quality and **credibility** of the **research/innovation project:** level of novelty, appropriate consideration of inter/multidisciplinary and gender aspects	Enhancing the **future career** prospects of the researcher **after the fellowship**	Coherence and effectiveness of the **work plan**, including appropriateness of the allocation of tasks and resources
Quality and appropriateness of the training and of the two way **transfer of knowledge** between the researcher and the host	Quality of the proposed measures to **exploit** and **disseminate** the project results	Appropriateness of the **management structure and procedures**, including risk management
Quality of the supervision and of the integration in the team/institution	Quality of the proposed measures to **communicate** the project activities to different target audiences	Appropriateness of the **institutional environment** (infrastructure)
Potential of the researcher to reach or re-enforce a position of professional maturity/independence during the fellowship		

diana.massai@polito.it
diego.gallo@polito.it

Application

Go to Funding & tender opportunities Portal

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-msca-2022-pf-01-01;callCode=null;freeTextSearchKeyword=MSCA;matchWholeText=true;typeCodes=1;statusCodes=31094501,31094502,31094503;programmePeriod=null;programCcm2Id=null;programDivisionCode=null;focusAreaCode=null;destination=null;mission=null;geographicalZonesCode=null;programmeDivisionProspect=null;startDateLte=null;startDateGte=null;crossCuttingPriorityCode=null;cpvCode=null;performanceOfDelivery=null;sortQuery=sortStatus;orderBy=asc;onlyTenders=false;topicListKey=callTopicSearchTableState



diana.massai@polito.it
diego.gallo@polito.it

Application

Proposal has to be created and submitted electronically through the submission wizard

PART A	PART B
• on-line • Administrative info	• Training and research programme description (10 pages) • Proposal shall follow the template and instructions provided for Part B • Curriculum Vitae (5 pages) • Guide for Applicants 2020

diana.massai@polito.it
diego.gallo@polito.it

Application

PART A

5 sections (online):

1. General information and Declarations
2. Administrative data of Participating Organisations
3. Budget
4. Ethics
5. Call specific questions

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B

7 sections (submitted as pdf):

1. Excellence
2. Impact
3. Implementation

Max 10 pages
"excess pages above this limit will automatically be made invisible"

4. CV of the experienced researcher (5 pages)
5. Capacity of the Participating Organisations
6. Ethical Issues
7. Letter of Commitment (Global Fellowship only)

diana.massai@polito.it
diego.gallo@polito.it

Application

Excellence 50%	Impact 30%	Implementation 20%
1.1 **Quality** and **credibility**; level of **novelty**, **inter/multidisciplinary** and **gender aspects**	2.1 **Enhancing future career** prospects **after** the fellowship	3.1 **Coherence** and **effectiveness** of the **work plan**, tasks and resources
1.2 **Quality** and **appropriateness** of **training** and of the **two way transfer of knowledge**	2.2 Quality of measures to **exploit** and **disseminate**	**GANTT chart**
1.3 **Quality** of **supervision** and **team/institution**	2.3 Quality of measures to **communicate** to **different target audiences**	3.2 **Appropriateness** of the **management structure**, **risk management**
1.4 **Potential to reach or re-enforce** professional independence during fellowship		3.3 **Appropriateness** of the **institutional environment** (infrastructure)

Max 10 pages!

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.1 Quality and credibility; level of novelty, inter/multidisciplinary and gender aspects

Why it is important

State of the art

Specific objectives to be achieved in 24 months

Novelty

Methodology

How the research is inter/multidisciplinary

Gender aspects

State of the art

Limitations of current methods

Rationale

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.1 Quality and credibility; level of novelty, inter/multidisciplinary and gender aspects

2. Excellence

2.1 Quality, innovative aspects and credibility of the research

2.1.1 Introduction and state of the art

The development of the induced pluripotent stem cell (iPSC) technology by somatic cell reprogramming[1] has the potential to revolutionize biomedical sciences[2]. Human iPSCs overcome ethical obstacles related to human embryonic stem cells and are likely to supersede the need of immune suppression treatments for therapeutic cell transplantation. In addition, due to their essentially unlimited proliferative capacity and their potential to differentiate into any somatic cell type *in vitro*, hiPSCs could solve the current lack of primary somatic cells in biomedicine. Therefore, **hiPSCs constitute a superior, renewable cell source for basic stem cell research[3], drug discovery[4], *in vitro* personalized disease modelling[5], and cell-based personalized regenerative therapies[6]**. However, **for their widespread industrial and clinical use key challenges remain. These include the reliable mass production of hiPSCs and their progenies by means of scalable Good Laboratory/Manufacturing**

...

scaling. However, hiPSC bioprocessing in **conventional stirred-tank bioreactors still suffers from critical issues**:

1. Impeller-based stirring can induce **detrimental stresses on cells**, known to reduce cell viability[13,14,18] and to be particularly critical for the sensitive equilibrium of pluripotent proliferation versus differentiation, with possible undesired differentiation and consequent culture heterogeneity[7,13,19].
2. Despite optimisation of culture media and addition of protective supplements, single cell-inoculated human pluripotent stem cell culture results in about **50% viable cell loss post inoculation**, with linear rather than

...

This highlights that **current hiPSC expansion and differentiation protocols lack reproducibility and efficiency, representing a significant obstacle for envisioned cell applications[7,17,21]. The way forward requires the development of novel technologies for automated GLP/GMP-conform hiPSC processing to enable highly robust and cost-effective hiPSC production, turning technologies' potential into applied reality**.

State of the art

Limitations of current methods

Rationale

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.1 Quality and credibility; level of novelty, inter/multidisciplinary and gender aspects

2.1.2 Overview, objectives and originality of the action

Through a highly multidisciplinary approach based on the synergistic collaboration between the engineering excellence of the Researcher and the hiPSC bioprocessing strength of the Host Organization, POSEIDON project will drive the **development of a pioneering bioreactor platform for reproducible, efficient and scalable hiPSC culture**. This will be complemented by the development of **a novel "one-step process" directly coupling hiPSC expansion and cardiomyogenic differentiation,** to demonstrate utility of the novel platform for the production of a valuable functional human cell type. Therefore, the main scientific objectives of POSEIDON are:

1. **Development of a next-generation automated low-shear suspension bioreactor**
2. **Development of a novel bioreactor-based suspension culture protocol for hiPSC expansion**
3. **Development of a novel bioreactor-based combined hiPSC expansion and differentiation protocol for cardiomyocyte production**

Applying her bioengineering knowhow[22,23], the Researcher will design and construct a next-generation bioreactor prototype enabling **non-impeller-dependent low-shear dynamic suspension culture**. This condition will promote the formation of homogeneous 3D hiPSC aggregates and avoid detrimental stresses, substantially improving cell

...

2.1.3 Methodology and innovative aspects of the research

To achieve the project objectives, respective Work Packages (WPs), which are subdivided into sequential and overlapping tasks (Ts), will be carried out. The scientific WPs (WP2, WP3, WP4), described below, are closely interconnected to WPs for training (WP1, §2.2.3) and management/dissemination (WP5, §3.2).

WP2 – Development of the next-generation bioreactor

The bioreactor will be developed starting from an existing proof-of-concept prototype realized by the Researcher group[23], composed of a pilot version of the culture chamber (CC) and a basic perfusion system (PS), that has confirmed the general suitability of the design[30]. Specifically designed modular systems will enable automated and

Aim and novelty of the research activity and main scientific objectives

Specific objectives (WP, Tasks)

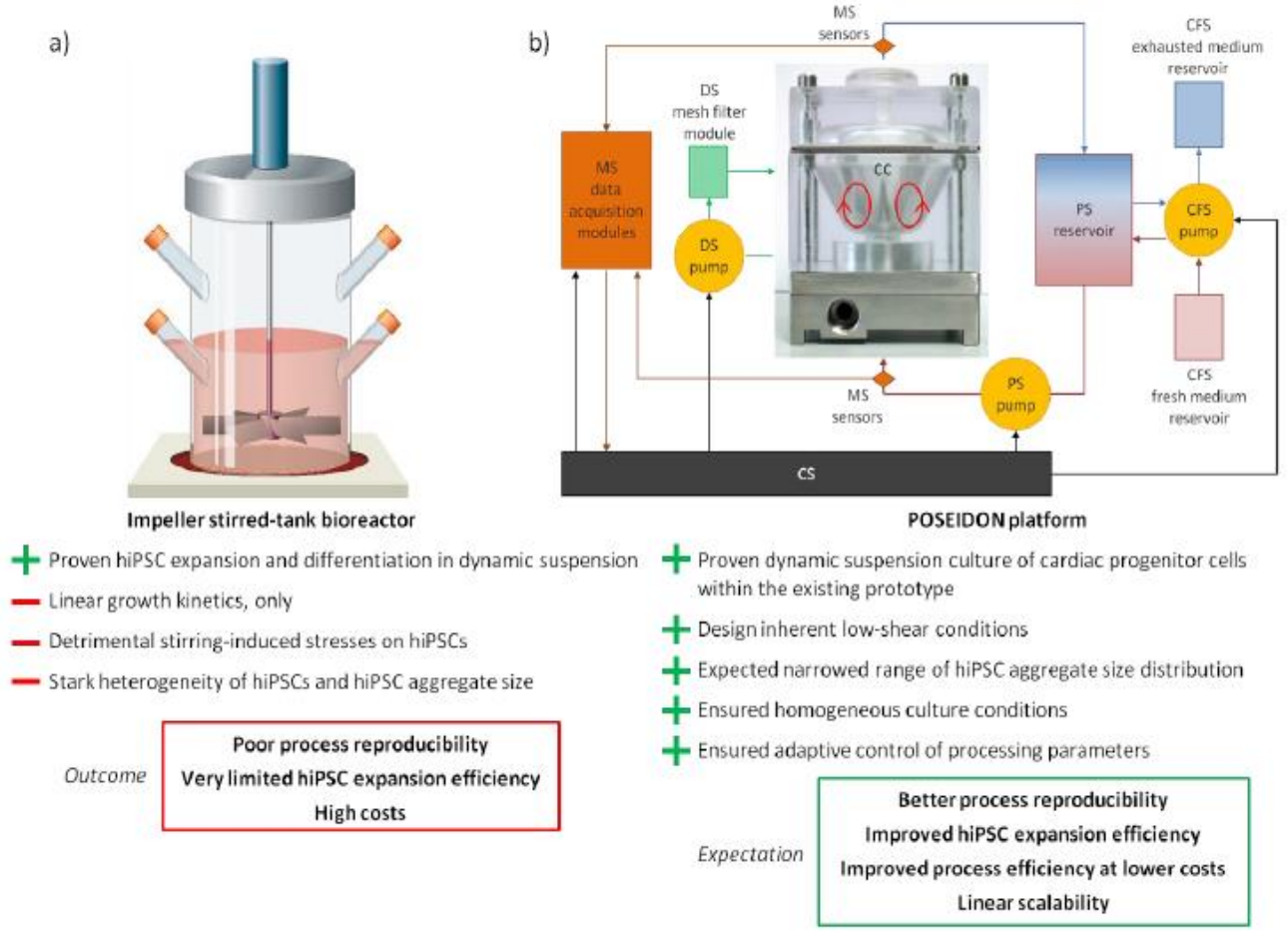
diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.1 Quality and credibility; level of novelty, inter/multidisciplinary and gender aspects

EXPLOIT the communicative power of schemes, graphs, figures!



diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.2 Quality and appropriateness of training and of the two way transfer of knowledge

Transfer of knowledge to researcher

Transfer of knowledge to host

Career development plan

Training for the development of the researcher

Transfer of knowledge for the development of the researcher

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.2 Quality and appropriateness of training and of the two way transfer of knowledge

2.2 Clarity and quality of transfer of knowledge/training for the development of the researcher in light of the research objectives

2.2.1 Training

During her career, Dr. Diana Massai has crossed through different engineering disciplines, demonstrating a **great interest and aptitude to acquire new skills and techniques**. Through this interdisciplinary research, Diana is well equipped for acquiring excellent scientific and technical skills, which will diversify her bioengineering knowledge and provide her with new competences in the complementary field of stem cell biology. A further essential goal will be the development of invaluable leadership skills, which will make her competent to lead her own research laboratory and make strategic decisions in the future. By doing research in one of the World's foremost stem cell laboratories, Diana will develop **scientific expertise in stem cell science and related research methods** under the

Training for the development of the researcher

2.2.2 Transfer of knowledge

Diana will exploit her communication and teaching skills, developed through several years of research dissemination and academic teaching (§5.6/8), to **transfer her engineering methodology, bioreactor development and multiphysics modelling expertise** to the Zweigerdt group and collaborating teams at LEBAO, also **transmitting enthusiasm, scientific creativity and engineering excellence**. These groups will significantly benefit from Diana's knowhow and research ideas, which will provide solutions to a number of technical and biological issues of current systems (described in §2.1.1), and new robust and comprehensive tools for successful advanced integrated research. Diana will also transfer her bioengineering expertise presenting at REBIRTH and StemBANCC seminars (details in §2.3.1). This approach will give rise to a **virtuous self-increasing knowledge-transfer loop**, where all parties can obtain the maximum benefit. Moreover, Diana and Dr. Zweigerdt, who started their collaboration in 2009 through the FP7 European project BIOSCENT (details in §5.4), will share their international contacts (§5.13) leading to a **strengthened virtuous collaboration and widened contact network**.

Transfer of knowledge for the development of the researcher

2.2.3 Training and transfer of knowledge plan

WP1 – Training and transfer of knowledge will be based on the following tasks:

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.2 Quality and appropriateness of training and of the two way transfer of knowledge

DO NOT FORGET transferable (soft) skills!

	ACCADEMIA / R&D POSITION	ENTREPRENEURSHIP	INDUSTRIAL / MANAGEMENT
Path-oriented skills	• Research integrity • Responsible research and innovation, the impact on social challenges • Etica informatica • Writing Scientific Papers in English • Bibliography and literary state of art	• Entrepreneurial Finance • Entrepreneurship & start-up creation • Lean startup and lean business for innovation management • The new internet society: entering the black-box of digital innovations • Epistemologia della macchina	• HR management & Organization and models • Entrepreneurial Finance • Lean startup and lean business for innovation management • The new internet society: entering the black-box of digital innovations • Managing conflict: negotiation and communication • Epistemologia della macchina
Employability	• Job opportunities (Navigating the hiring process: CV, tests, interview) • Job searching • Personal branding		
Common ground skills	• Project management + Project management II • Public speaking + Public speaking II • Communication + Communication II • Time management + Time management II • Intercultural & Interpersonal management • IPR • Social and environmental impact • Fund raising • Thinking out of the box		

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.3 Quality of supervision and team/institution

Qualifications and experience of the **supervisor(s)** on:

- the **research topic proposed** (track records + international collaborations)
- **supervision/training at advanced level** (PhD, postdoc)

Supervisor experience and qualification

To show that the experienced researcher will be **well-integrated within the team/institution** so that all parties gain **maximum knowledge and skills:**

- **nature and the quality of the research group**
- **measures taken to integrate the researcher**

Quality of the hosting

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.3 Quality of supervision and team/institution

2.3 Quality of the supervision and the hosting arrangements

2.3.1 Qualifications and experience of the supervisor

Dr. Robert Zweigerdt is a developmental biologist, internationally recognised for his research expertise in stem cell biology, particularly in the field of process development for pluripotent stem cells expansion and cardiomyogenic differentiation in suspension culture within controlled bioreactors[7,12,13,14,26,27,28]. He was involved in the derivation of the worldwide first GMP-compliant human pluripotent stem cell lines[41], has a long-standing interest in cardiac stem cell therapy[42], and works on the mass generation and therapeutic application of stem cell-derived cardiomyocytes utilizing hiPSC[29]. Since 2009, Dr. Zweigerdt has been a PI at the Leibniz Research Laboratories for Biotechnology and Artificial Organs (LEBAO) at MHH, working on the therapeutic and industrial application of hiPSC in collaboration with Prof. Martin, a world renowned scientist in iPSC derivation and modification, and the surgeon Prof. Haverich, head of the Department of Cardiothoracic, Transplantation and Vascular Surgery (HTTG) of MHH, which hosts the LEBAO. At LEBAO he collaborates also with Dr. Gruh and Dr. Hilfiker,

2.3.2 Host scientific expertise in the field and researcher integration

The group of Dr. Zweigerdt is a leader in stem cell bioprocessing and an integral part of LEBAO at HTTG/MHH, **in one of the world leading hubs for hiPSC-based biomedical research**[43]. It currently consists of an interdisciplinary international team of 8 young scientists and PhD students. The group is closely integrated in the European consortium StemBANCC and in the Cluster of Excellence REBIRTH, under the project "Mass Production of Pluripotent Stem Cells and Derivatives", constituting an interdisciplinary network that provides any up-to-date technology in current biomedical research. Dr. Massai will be a full member of the Zweigerdt group, where she will benefit of excellent expertise and extensive network connections, with her development needs being a high priority to the Host (§2.2.1, 3.1.1). She will participate in the HTTG meetings, profit from LEBAO/HTTG/MHH resources and infrastructures (§4.3,§6), and will have her own dedicated work space. She will also be a Visiting Fellow of REBIRTH, which, in addition to an excellent interdisciplinary network, provides a dedicated career development program for young scientists and structured doctoral training, from which Diana can

Supervisor experience and qualification

Quality of the hosting

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B - EXCELLENCE

1.4 Potential to reach or re-enforce professional independence during fellowship

Tell the story about **the way you arrived here** and about the fact that you are the **right person to perform this research** program **now**!

Researcher background and potential

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – EXCELLENCE

1.4 Potential to reach or re-enforce professional independence during fellowship

2.4 Capacity of the researcher to reach and re-enforce a position of professional maturity in research

Diana Massai has always performed at the highest levels throughout her education and training. She has demonstrated **great potential by acquiring and developing new expertise in several disciplines**, while expanding her knowledge and skills at every stage. During her PhD and after, she has been part of the Industrial Bioengineering Group at Politecnico di Torino (Polito), a multidisciplinary team focused on innovative investigation methods and technological solutions for regenerative medicine applications, cell mechanics and biofluid mechanics. Since 2007, she has assiduously participated in **conceiving, writing, developing and managing a number of national and international research projects** (§5.4/7). This has allowed Diana to acquire advanced scientific and technical knowledge that supported her **original scientific contribution to the fields of computational multiphysics modelling and bioreactor development**, with a wide number of scientific publications (§5.6) accompanied by academic achievements and awards (§5.4/5). Her **endless scientific creativity** drove her to study new concepts in devices for dynamic cell culture and to be **co-author of the proof-of-concept prototype patent**[23]. This research context supported her in developing advanced capabilities for **independent thinking** and **planning**, **management**, **communication** as well as **networking skills**, establishing a wide number of **excellent international collaborations** (§5.13). She has also been responsible for the supervision of 3 PhD and 11 undergraduate students, mentoring them to be more effective in their research trajectory. Moreover, the researcher is currently regular lecturer in "Cell and Tissue Bioengineering" and "Bioreactors" at Polito (§5.8), and she has demonstrated leadership qualities as Fellow representative at her Department at Polito. In addition to her academic activities, Diana is strongly interested in the **translation of her research into successful industrial products** that support the clinical use of pioneering regenerative therapies. Therefore in 2013, thanks to her **entrepreneurship skills**, she **created and co-founded the academic spin-off BIOEXPANSYS** located at the I3P-Innovative Enterprise Incubator of the Polito. This company operates in the sector of innovative bioreactors for dynamic cell culture, and Diana is the **Bioreactor Technical Officer** (§5.7). All these experiences put Diana in an

Researcher background and potential

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPACT

2.1 Enhancing the future career prospects of the researcher after the fellowship

Impact of the planned **research and training** at **researcher level after** the fellowship:

- How **new competences and skills** can make the **researcher more successful**
- **Explicitly outline the career goals**

Impact on researcher career

Impact of the planned **research and training** at **organization and system level**

Impact on European society

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPACT

2.1 Enhancing the future career prospects of the researcher after the fellowship

3.1 Enhancing research- and innovation-related human resources, skills, and working conditions to realise the potential of individuals and to provide new career perspectives

3.1.1 Impact on researcher

For the first time in her career, Diana will be directly involved in each scientific and management step of the research. This will enable her to acquire comprehensive scientific expertise and to strengthen her intellectual and management skills, strongly motivating her scientific creativity and passion for research. In particular, Diana will acquire **new excellent scientific and technical skills** related to laboratory procedures, culture processes for hiPSC expansion and cardiac-differentiation, and methods for data analysis and processing. Following each research step, the applicant will reinforce her **analytical skills** and, by adding her current and new developed competences and applying **critical and creative thinking**, she will develop wider expertise in **problem solving**. By the analysis of the information and data collected, she will progressively identify the new findings of the research, enhancing her **synthesising skills**. The role of responsibility will furthermore strongly motivate the researcher and will give her

Impact on researcher career

3.1.2 Impact on European society

POSEIDON will contribute to the **European "pool" of talent in biomedical sciences** with great social and economic impact. The research outcomes will be of **tremendous benefit to the European biomedical, pharmaceutical, and cell therapy research and business sectors**, since the new platform will provide a revolutionary solution to the current challenge of standardized mass production of hiPSC, making available a suitable number of cells for both industrial and clinical use. POSEIDON will allow for turning the research potential into **applied reality and advanced innovative solutions for stem cell research, drug discovery, as well as personalized in vitro disease modelling and regenerative therapies**. This will strongly contribute to the European "Innovation Union", supporting crucial research and health sectors with consequent **European excellence and competitiveness in the exponentially growing stem cell global market**, with the final aim of **improving quality of life in Europe**.

Impact on European society

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B - IMPACT

2.2 Quality of the proposed measures to exploit and disseminate the project results

Key results

Target audience: peers

Activities

Exploitation methods

DISSEMINATION	EXPLOITATION
Transfer knowledge and results **Pave the way** towards exploitation	**Use** project results
Results	**Results**

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPACT

2.2 Quality of the proposed measures to exploit and disseminate the project results

Key results

Activities

Target audience: peers

DISSEMINATION	EXPLOITATION
Transfer knowledge and results **Pave the way** towards exploitation	**Use** project results
Results	**Results**

Results dissemination

Results exploitation

Exploitation methods

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPACT

2.2 Quality of the proposed measures to exploit and disseminate the project results

3.2.2 Dissemination of the research results

Diana will disseminate the project achievements at the **main international conferences focused on stem cell research and manufacturing technology for stem cell bioprocessing** organized by the ISSCR (06/2015), Tissue Engineering and Regenerative Medicine International Society (TERMIS, 09/2015), Society of Biological Engineering (SBE), European Society of Biomechanics (ESB, 07/2015), GSCN. She will present at the REBIRTH Colloquia and to the dissemination events of StemBANCC Network. In parallel, **high quality scientific papers will be submitted to the most important journals** in the field (e.g. Nature Biotechnology, Nature Protocols, Cell Stem Cell, Stem Cells, Tissue Engineering, Biotechnology and Bioengineering, Biomechanics and Modeling in Mechanobiology, etc.). Moreover, the applicant will participate to the exhibitions Hannover Messe (04/2015), Ideen Expo (07/2015), and Biotechnica (10/2015). This dissemination plan will allow Diana to present the project results to research experts and to the European stem cell manufacturing, bioreactor and pharmaceutical industries, **supporting the Fellowship impact on European excellence and competitiveness**.

Results dissemination

3.2.3 Exploitation of results and intellectual property

In terms of intellectual property right, a specific Agreement between Polito and MHH will regulate the new developments of the existing proof-of-concept prototype, patented in Italy by the researcher group[23]. The project will provide opportunities to discover new knowledge and processes, whose **patentability will be considered** with the support of the MHH's technology transfer partner Ascenion. During the research, Diana will make use of the European IPR Help Desk. The applicant will receive the correct degree of recognition on any patents, granting access rights for internal research activities a royalty-free basis.

Results exploitation

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B - IMPACT

2.3 Quality of the proposed measures to communicate the project activities to different target audiences

Non specialists

Project and its results

Public engagement activities

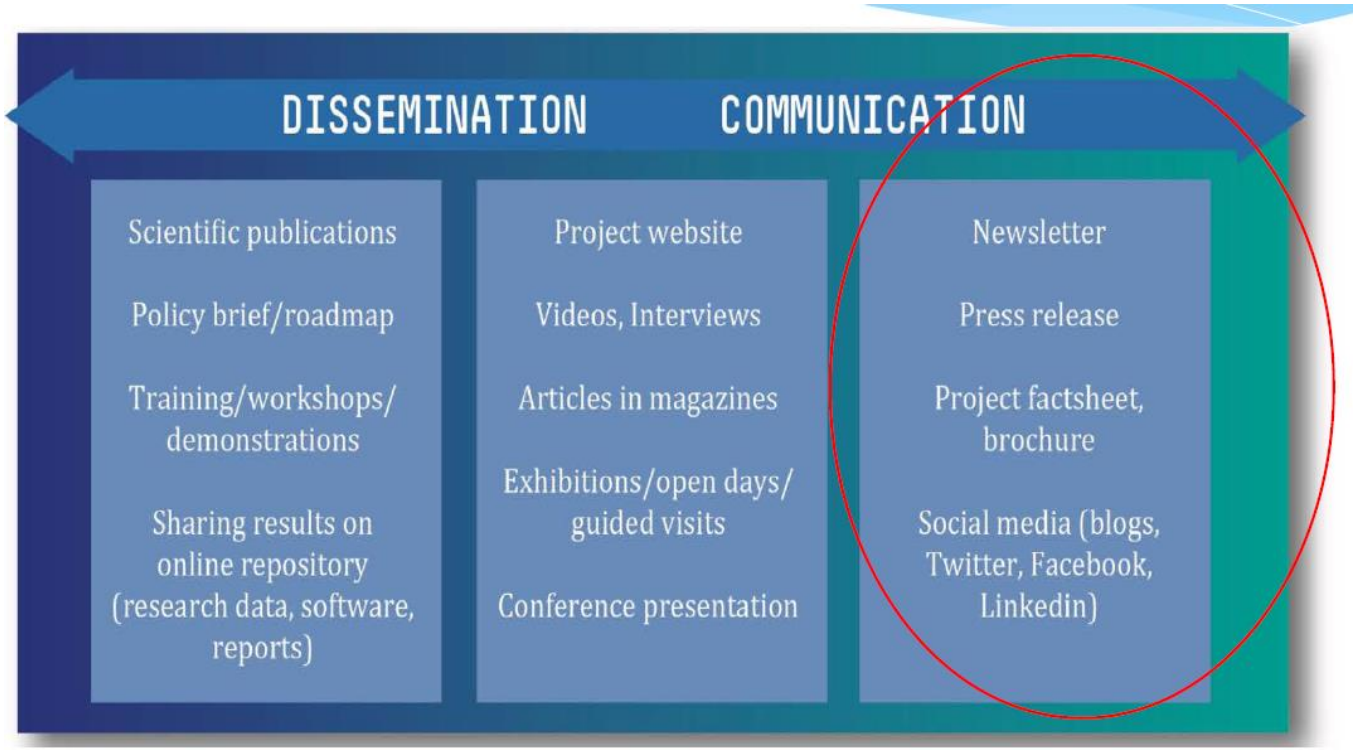
COMMUNICATION
Reach out to society and show impact and benefits
Project and its **results**

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPACT

2.3 Quality of the proposed measures to communicate the project activities to different target audiences



COMMUNICATION
Reach out to society and show impact and benefits
Project and its **results**

Concrete planning for communication activities must be included in the Gantt chart

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B - IMPLEMENTATION

3.1 Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources

How the **work planning (including deliverables and milestones) and the resources** mobilised will ensure that the **research and training objectives will be reached**

Project organisation

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPLEMENTATION

3.1 Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources

4.1 Overall coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources

The project will have a duration of 24 months. The work plan is composed of 5 WPs with related Ts, listed in the Gantt Chart (Table 1). Research progress will be measured by deliverables/milestones listed in Table 2.

Table 1. POSEIDON Gantt chart with deliverables and milestones timing.

POSEIDON GANTT	I YEAR												II YEAR											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
WP1. Training and transfer of knowledge		D1.1			D1.2		M1.1 M1.2					M1.1 M1.2	D1.3					M1.1 M1.2		D1.4				
T1.1 Training on hiPSC culture and expansion protocols		C	SC				SC	C				SC												
T1.2 Training on investigation methods and data					SC	C			SC		C		SC											
T1.3 Training on hiPSC cardiac differentiation protocols										SC		C		SC										
T1.4 Transfer of knowledge	SC				C				SC				C			SC								
T1.5 Training on transferable skills			N	IM		C	N	IM		N		IM	N	C	IM	N			IM	N				
WP2. Development of the next-generation bioreactor							M2.1 D2.1						M2.2			D2.2								
T2.1 Culture chamber development																								
T2.2 Perfusion system development																								
T2.3 Dissociation system development																								
T2.4 Monitoring and control systems development																								
WP3. Development of the novel bioreactor-based hiPSC expansion and cardiac differentiation															M3.1		D3.1			M3.2		D3.2		
T3.1 Development of the hiPSC expansion protocol																								

Table 2. List of POSEIDON deliverables and milestones.

Deliverables	Milestones
D1.1 Definition of bioreactor design requirements *m2*	**M1.1** Training progress review *m7, m12, m18*
D1.2 Definition of hiPSC expansion protocol requirements *m5*	**M1.2** Transfer of knowledge progress review *m7, m12, m18*
D1.3 Definition of hiPSC cardiac differentiation protocol requirements *m14*	**M2.1** Selection of bioreactor materials *m7*
D1.4 Definition of industrial translation and IPR	**M2.2** Selection of bioreactor technological components *m13*
	M3.1 Selection of culture components and parameters for

Project organisation

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPLEMENTATION

3.2 Appropriateness of the management structure and procedures, including risk management

Describe the **organization and management structure**, as well as the **progress monitoring mechanisms** put in place, **to ensure that objectives are reached**

Project management

Discuss the **research and/or administrative risks** that might endanger reaching the action objectives and the **contingency plans to be put in place** should risks occur

Indicate here information on the support services provided by the host institution (European offices, HR services…).

Risk management

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPLEMENTATION

3.2 Appropriateness of the management structure and procedures, including risk management

4.2 Appropriateness of the management structure and procedures, including quality management and risk management

The project management (T5.3) will be led by Diana supported by Dr. Zweigerdt in his capacity as research group leader and host. The progress monitoring will involve weekly meetings with the research group and progress reports every 3 months, allowing early intervention and steering in case of possible risks (Table 3). Diana will be the primary researcher and will be responsible for performing research, participating in training activities, reporting results to supervisor, managing and coordinating the project, performing periodic dissemination to experts and general public, preparing manuscripts for publication. Dr. Zweigerdt will be responsible for day-to-day management, training, and researcher guidance, ensuring opportunities and appropriate training for personal and career development. Moreover, he will be supervisor of the financial resources, and he will train Diana in project management, assist her with the dissemination of results, and introduce her to existing international networks, visiting scientists, industrial professional. The MHH EU Liaison office and Finances Department will assist Diana and Dr. Zweigerdt in the more general aspects of project management (details in §6).

Project management

Table 3. Risks and contingency plan.

Risk	M	Contingency plan
Inappropriate selection of bioreactor materials and/or technological components.	M2.1 M2.2	In-depth market research and interaction with industrial partners to identify the optimal materials and products. Performance tests to promptly assess possible criticalities and identify alternative solutions (without renounce to the essential automation objectives).
Inappropriate computing resources.	M4.1	Simulations will be simplified and less parameters will be investigated.
Inappropriate design and/or realisation of the bioreactor and related systems	M4.2	Continuous feedback approach among tasks and bioreactor tests performed by sequentially adding bioreactor components for promptly identifying criticalities and intervene, modifying the component design and/or integrating commercially

Risk management

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPLEMENTATION

3.3 Appropriateness of the institutional environment (infrastructure)

Active contribution of the beneficiary to the research and training activities

Hosting infrastructure

Infrastructure, logistics, and facilities offered insofar as they are necessary for the **good implementation of the action**

Hosting competences

diana.massai@polito.it
diego.gallo@polito.it

Application

PART B – IMPLEMENTATION

3.3 Appropriateness of the institutional environment (infrastructure)

4.3 Appropriateness of the institutional environment (infrastructure)

The LEBAO provides 900 m^2 of modern lab space equipped with up-to-date technology for GLP basic and applied biomedical research, molecular biology, and cell culture, including respective cell storage facilities, high safety level laboratories (S2) and bioreactor work space. Strong interactive links between LEBAO and the HTTG clinic along the bench to bedside chain help to ensure the relevance of the basic and experimental research for later clinical translation. Up-scaling technologies and pro-active biosafety assessment complete the translational activities. In terms of project implementation, support will be available from the MHH EU Research Office, who deals with all aspects of EU applicants and grant management, and from the Financial Department, who have a specialized division for the financial management of EU grants (details in §6). At MHH Diana will have access to all supporting infrastructures, including the library, IT facilities and the university's training programme. MHH sustains Gender balance, equal opportunities and a family-friendly working environment, with a wide range of supporting measures.

Hosting infrastructure

4.4 Competences, experience and complementarity of the participating organisations and institutional commitment

MHH is one of the world's leading university medical centres. Its research activities focus on unravelling basic mechanisms for translation into clinical research in close collaboration with clinical facilities. At MHH, the LEBAO and HTTG, a close connection of application-oriented basic research and a clinical department, focus on the search for novel treatment options based on cell and gene therapy, regenerative medicine, and organ transplantation. Working in the Zweigerdt group, Diana will continuously interact with and learn from excellent researchers. Through advanced training, she will acquire scientific and technical expertise in stem cell science, particularly focused on hiPSC bioprocessing and related challenges for industrial and clinical translation. This multidisciplinary project will be an excellent example of the added value of integrative research, providing the Researcher with new essential complementary knowhow for professional development and the Host with advanced technological methods and tools. POSEIDON will strongly promote the transfer of knowledge between advanced bioengineering and pioneering stem cell biology, supporting the development of a synergic interplay and complementary collaboration, where all parties will gain the maximum benefits and skills.

Hosting competences

diana.massai@polito.it
diego.gallo@polito.it

Example of Evaluation scores

Criterion 1 - Excellence

Score: **4.70** (Threshold: 0.00/5.00 , Weight: 50.00%)

Quality, innovative aspects and credibility of the research (including inter/multidisciplinary aspects)
Clarity and quality of transfer of knowledge/training for the development of researcher in light of the research objectives
Quality of the supervision and the hosting arrangements
Capacity of the researcher to reach or re-enforce a position of professional maturity in research

STRENGTHS:
- *The proposal is of high scientific quality and the objectives are very well presented.*
- *The research programme is highly multidisciplinary and credible.*
- *The description of the state of the art is very well presented.*
- *The methodologies and approaches are adequate and are technically sound.*
- *The proposal demonstrates innovation and originality in its approach.*
- *The transfer of knowledge is consistent with the proposed research objectives.*
- *The supervisor is worldwide recognized in the field of stem cell biology and the experience in supervising students is well documented.*
- *The researcher demonstrates capacity to reach a position of professional maturity within the scientific community.*

WEAKNESSES:
- *The description of training in transferable skills at the host institution is very generic.*

Criterion 2 - Impact

Score: **4.60** (Threshold: 0.00/5.00 , Weight: 30.00%)

Enhancing research- and innovation-related human resources, skills, and working conditions to realise the potential of individuals and to provide new career perspectives
Effectiveness of the proposed measures for communication and results dissemination

STRENGTHS:
- *The contribution of the proposal to enhance research- and innovation-related human resources is convincingly presented.*
- *The working conditions to realise the potential of individuals and to provide new career perspectives are of very good quality.*
- *The measures proposed for the communication to the scientific community are well presented.*
- *The intellectual property issues are well discussed in the proposal.*

WEAKNESSES:
- *The proposed measures for public engagement are not sufficiently described in the proposal.*
- *The exploitation of the results is insufficiently addressed in the proposal.*

Overall comments

Not provided

Criterion 3: Implementation

Score: **4.80** (Threshold: 0.00/5.00 , Weight: 20.00%)

Overall coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources
Appropriateness of the management structures and procedures, including quality management and risk management
Appropriateness of the institutional environment (infrastructure)
Competences, experience and complementarity of the participating organisations and institutional commitment

STRENGTHS:
- *The work-plan is coherent with the proposed scientific and training objectives.*
- *The allocation of tasks and resources is adequately presented.*
- *The deliverables and milestones are of very good quality and are appropriate to achieve the proposed objectives.*
- *The management structure and procedures are well described and are feasible.*
- *The risk analysis is very good and the contingency plans are realistic.*
- *The infrastructures and the facilities offered to the fellow are appropriate to the work-plan.*
- *The competences and the experience of the host are convincingly demonstrated in the proposal.*

WEAKNESSES:
- *Some of the work packages overlap in the proposed time frame of the project.*

Overall comments

Not provided

diana.massai@polito.it
diego.gallo@polito.it

Useful links & references

https://cdn2.euraxess.org/sites/default/files/domains/asean/how_to_prepare_a_successful_msca-if_proposal_m_bramhaar_twente_university.pdf

https://www.upf.edu/documents/8055591/213727092/MSCA_judit.pdf/a758fa63-fa52-6848-3da6-397e768f84fb

https://cdn3.euraxess.org/sites/default/files/msca-proposal-writing_21sep17_papazoglou.pdf

https://enspire.science/category/marie-sklodowska-curie-actions/writing-a-winning-marie-sklodowska-curie-actions-grant-application/

Happy writing!

MARIE CURIE ACTIONS

diana.massai@polito.it
diego.gallo@polito.it