Marie Sklodowska-Curie Actions (MSCA) Horizon Europe

DOCTORAL NETWORKS MSCA DN 2022
Novelties and rules for participation

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Content

- Proposal structure and general main novelties from 2021

- Evaluation Process

- Award Criteria: how to write Excellence / Impact / Implementation sections

- General tips

- Useful resources

DN 2022: Resubmissions

Novelty for 2022 call

✓ **Resubmission restrictions:** applicants having received a score **below 80% in the DN 2021** call are not eligible to resubmit a similar proposal in the DN 2022 call.

✓ As specified in the submission forms Part A, a "Similar" proposal or contract is one that differs from the current one **in minor ways**, and in which **some of the present consortium members** are involved.

DN 2022: Submission and proposal structure

30 Pages

Horizon Europe Programme

Marie Skłodowska-Curie Actions
Doctoral Networks (HE MSCA DN)

Project proposal – Technical description (Part B)

Version 1.0
18 June 2021

part B1 (document 1):

- The maximum total length for this document is 34 pages
- Comprises the Start Page, Table of Contents, List of Participating Organisations and and declarations tables
- Sections 1-3
- Respect the instructions
- The Expert evaluators will disregard any excess pages above the 34 page limit

part B2 (document 2):

- Sections 4-7
- No overall page limit will be applied to this document
- Respect the instructions

DN 2022: B1 Key template changes from 2021

- **Work Package List moved** from Excellence to Implementation as Table 3.1a
- **Recruitment Deliverables moved** from Excellence to Implementation as Table 3.1e
- ✓ relabelled Recruitment Table per Beneficiary
- Table 3.1 **Description of Work Packages** -deliverable descriptions removed
- Table 3.1c **Deliverables List** –new column "Short description" added
- **Network organisation subheading moved** from part B1 to part B2
- **Joint governing structure subheading merged** with Network organisation
- **Environmental aspects moved** from part B1 to part B2 section 5

- **New subheadings**
- ✓ **Section 2.1**: *Developing sustainable elements of doctoral programmes after the end of the DN funding, this could include (non exhaustively) e.g. sustainability of training programmes at local or network-wide level, sustainable cooperation and secondment opportunities, sustainability of transferable skills training offering, sustainability of researchers recruitment according to the code of conduct for the recruitment of researchers*
- ✓ **Section 2.3**: *If exploitation is expected primarily in non-associated third countries, justify by explaining how that exploitation is still in the Union's interest.*
- ✓ **Section 3.2**: *Gender aspects concerning decision-making and recruitment embedded in the Supervisory board and Recruitment strategy*

DN 2022: B2 Key template changes from 2021

- **New sections added:**

✓ **Network organisation**: *Please explain the management structure and organisation of the network, including the roles of the different actors, and modus operandi including project monitoring and decision making. Please describe the Joint Governing structure for DN-ID and DN-JD.*

✓ **Environmental aspects in light of the MSCA Green Charter**: *Please explain how the proposed project would strive to adhere to the MSCA Green Charter during its implementation.*

DN 2022: Overview of the evaluation process

DN 2022: Award Criteria

EXCELLENCE	IMPACT	QUALITY AND EFFICIENCY OF THE IMPLEMENTATION
Quality and pertinence of the project's research and innovation objectives	Contribution to structuring doctoral training at European level and strengthening European innovation capacity	Quality and effectiveness of the work plan, assessment of risks, and appropriateness of the effort assigned to work packages
Soundness of the proposed methodology	Credibility of the measures to enhance the **career perspectives of researchers** and contribution to their skills development	Quality, capacity and role of each participant, including hosting arrangements and extent to which the consortium as a whole brings together the necessary expertise
Quality and credibility of the training programme	Suitability and quality of the measures to maximise expected **outcomes and impacts**, as set out in the dissemination and exploitation plan, including communication activities	
Quality of the supervision	The magnitude and importance of the project's contribution to the expected scientific, societal and economic impacts	
50%	**30%**	**20%**

DN 2022: EXCELLENCE

1.1. Quality and pertinence of the project's research and innovation objectives

1.2. Soundness of the proposed methodology

1.3. Quality and credibility of the training programme

1.4. Quality of the supervision

1.1. QUALITY AND PERTINENCE OF THE PROJECT'S RESEARCH AND INNOVATION OBJECTIVES: REQUIRED SUBHEADINGS

- **Introduction, objectives and overview of the research programme**. It should be explained how the individual projects of the recruited researchers will be integrated into – and contribute to – the overall research programme. All proposals should also describe the research projects in the context of a doctoral training programme. Are the objectives measurable and verifiable? Are they realistically achievable?

- **Pertinence and innovative aspects of the research programme** (in light of the current state of the art and existing programmes / networks / doctoral research trainings). Describe how your project goes beyond the state-of-the-art, and the extent the proposed work is ambitious

- The action should be divided in Work Packages and described in **the Table 3.1a** under the Implementation section

#§CON-SOR-CS§# #§PRJ-MGT§RM§#

Table 3.1 a: Work Package[7] (WP) List

WP No.	WP Title	Lead Beneficiary No.	Lead Beneficiary Short Name	Start Month	End month	Activity Type[8]	Researcher involvement[9]

⚠ *The Work Packages should reflect the research objectives. Only brief headings and overviews of the Work Packages should be presented in Table 3.1a. More details in terms of actual implementation should be provided in Table 3.1b.*
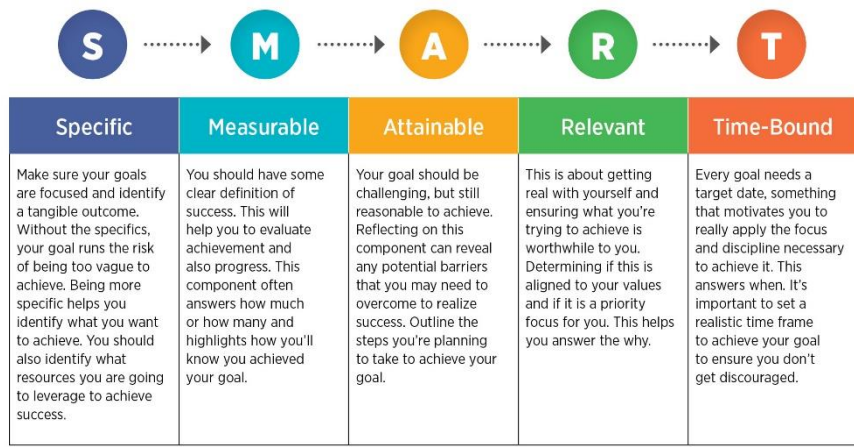
❑ **"Executive summary of your DN programme"** : what, why, who, how

✓ Relevance and timeliness of your research: European policies, SDGs, societal needs
✓ Clear and focused research goal and specific research objectives (SMART)
✓ Triple I dimension for research and training and cohesion of the consortium to deliver

❑ Highlight the originality **and innovative aspects** of the project:

✓ Novelty of research objectives compared to SoA (up to date bibliography, cite consortium)
✓ Check for similar DNs/existing programmes: what are the synergies, what are the differences?

Specific	Measurable	Attainable	Relevant	Time-Bound
Make sure your goals are focused and identify a tangible outcome. Without the specifics, your goal runs the risk of being too vague to achieve. Being more specific helps you identify what you want to achieve. You should also identify what resources you are going to leverage to achieve success.	You should have some clear definition of success. This will help you to evaluate achievement and also progress. This component often answers how much or how many and highlights how you'll know you achieved your goal.	Your goal should be challenging, but still reasonable to achieve. Reflecting on this component can reveal any potential barriers that you may need to overcome to realize success. Outline the steps you're planning to take to achieve your goal.	This is about getting real with yourself and ensuring what you're trying to achieve is worthwhile to you. Determining if this is aligned to your values and if it is a priority focus for you. This helps you answer the why.	Every goal needs a target date, something that motivates you to really apply the focus and discipline necessary to achieve it. This answers when. It's important to set a realistic time frame to achieve your goal to ensure you don't get discouraged.

1.1. QUALITY AND PERTINENCE OF THE PROJECT'S RESEARCH AND INNOVATION OBJECTIVES: ESR WEAKNESSES – DN 2021

- Originality and innovative aspect of the project is not convincing because the research is largely focusing on the analyses of already existing datasets with no clear size
- The proposal has too many objectives and lacks clarity. Some of the figures are too small and are not clearly explained
- The programme and its objectives span a disparate collection of topics. The overview and the state-of-the-art is general, and lack details on each aspect.

- The theoretical modelling is not convincingly demonstrated to be innovative, and the advance beyond the present state-of-the-art is not sufficiently explained.
- The innovative approach has not been sufficiently elaborated. The research is based on methods and approaches currently available.
- The state-of-the-art is not well documented or discussed.
- The state of the art gives insufficient attention to how the different disciplines will contribute to the issues raised by the proposal.

1.2. SOUNDNESS OF THE PROPOSED METHODOLOGY: REQUIRED SUBHEADINGS

Overall methodology

Integration of methods and disciplines

Gender dimension

Open Science Practices

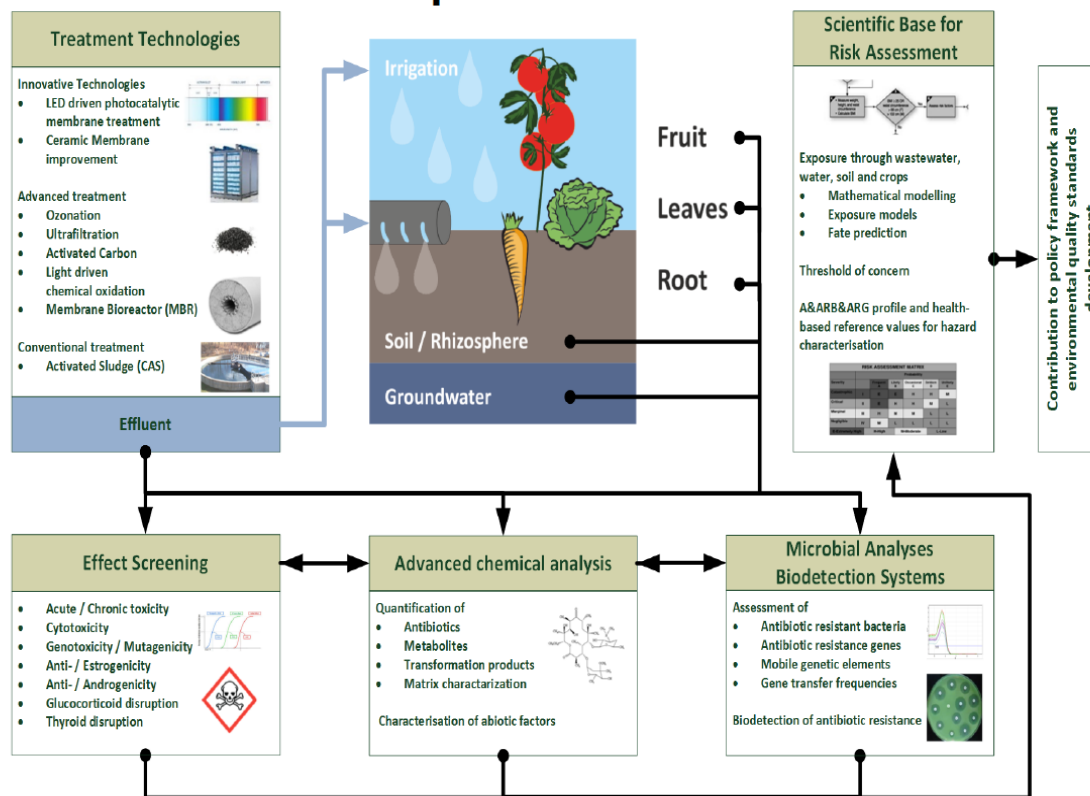Research Data Management

Artificial Intelligence

(if aplicable)

1.2. SUBHEADINGS OVERALL METHODOLOGY AND INTEGRATION OF METHODS AND DISCIPLINES: TIPS

✓ Explain the concepts, models and assumptions emerging from the state of the art

✓ Which techniques, methods, intruments will be used to achieve your scientific objectives: how is your approach innovative/different from others?

✓ Explain multi-/interdisciplinary aspects: *integration of data, techniques, tools, perspectives, conceptos or theories from two or more scientific disciplines*

✓ Identify any challenges: these will later be presented under risk assessment in section 3

✓ Be visual: use diagrams … organise the methodology description by Work Packages if wanted

MSCA-NET

Conceptual Framework

Source ANSWER ITN

1.2. SUBHEADING GENDER DIMENSION AND OTHER DIVERSITY ASPECTS

- Gender dimension and other diversity aspects: Describe how the gender dimension and other diversity aspects are taken into account in the project's research and innovation content. If you do not consider such a gender dimension to be relevant in your project, please provide a justification.

Gender + Diversity

- Sex (biological quality)
- Gender (socio-cultural process)

- Diversity ((biological quality; socioeconomic or socio-cultural process): age, race, ethnicity, social class, etc

Gender balance in decision-making processes

Gender dimension in research and innovation (R&I) content

Gender balance in project teams at all levels
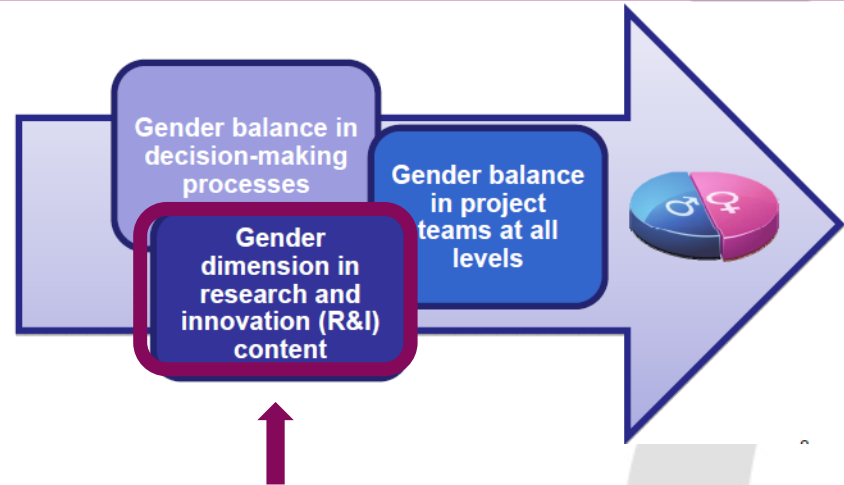
Gender in Research and Innovation content

Ask yourself the following questions:

- *Will the results of the research, now or at any point in the future be applicable to **humans**? Is it a **social oriented project**? If so, gender/intersectionality needs to be considered.*

- *Does it matter whether test persons are male or female?*

- *Have you questioned **gender assumptions** that may influence your scientific priorities, research questions and methods?*

- *Will the r**esults** of the project affect males and females in the same way?*

- *Does the **methodology** ensure that (possible) gender differences will be investigated: that sex/gender differentiated data will be collected and analysed throughout the research cycle*

- *Are **questionnaires, surveys, focus groups**, etc., designed to unravel potentially relevant sex and/or gender differences in your data?*

- *Are the **groups involved** in the project (e.g., samples, testing groups) gender-balanced?*

Link Yellowwindow

Gender dimension may apply to research involving the use of **animals** too

Other diversity aspects (if applicable): e.g., ethnicity and race (including migrants and refugees), social class and wealth, human physical parameters (size, weight), gender identity, sexual orientation, LGBTI+ issues, disability, and age.

Gender in Research and Innovation content

Recommendations

- ✓ Include **specific studies** on gender / diversity in the activities of your project (c. eligible)

- ✓ Use **disaggregated data.**

- ✓ Apply **methodologies** that allow differentiated analysis of gender / diversity

- ✓ Incorporate **references to studies/projects** on gender/diversity

- ✓ Carry out **training activities** on the gender/diversity dimension (eligible c.)

- ✓ Incorporates **experts** or researchers with experience in gender / diversity

- ✓ If relevant, gender-specific **tasks or Work Packages.**

Tools:
- ✓ [EC Video on Understanding the Gender Dimension for MSCA projects](#)
- ✓ [Toolkit gender in EU-Funded research](#)
- ✓ [Gender equality and diversity in R&I](#)
- ✓ Gendered innovations (ejemplos)
http://genderedinnovations.stanford.edu

DN 2022: Gender balance in project teams at all levels

- **Researchers involve in the proposal.**
  - ✓ Part A_table (template)

- **Recruitment/promotion processes:**
  - ✓ Policy on gender balance of selection panels.
  - ✓ Policy on equality training for members of selection panels.
    - *Video: Recruitment Bias in Research Institutes. CERCA Institute*
    - *https://www.youtube.com/watch?v=g978T58gELo&t=3s*
  - ✓ Development of gender-aware recruitment processes.
    - *Inclusive language, family conciliation measures, maternity leave, etc*
  - ✓ Attracting female fellows to male-dominated STEM disciplines
    - *Communication campaigns, etc*

- **Supporting women/men in career progression:**
  - ✓ Career/professional development programs.
  - ✓ Mentoring programme .
    - i.e: Mentoring M2M (UPC); MENTOS Mentoring Female Engineering Students (UPF

Section: 3.1; 3.2

Section: 1.4; 2.1; or 3.1 & 3.2

DN 2022: Gender balance in decision-making process

- **Project Governance structures (gender/diversity balance):**
  - ✓ Consortium governance.
  - ✓ Advisory board members.
  - ✓ Etc.

Section: 3.2

- General aspects (all sections):
  - ✓ Suport/Synergies/ etc with other institutional gender activities:
  - ✓ Gender Equality Offices.
  - ✓ Gender Equality Plans.
  - ✓ Gender experts.
  - ✓ Gender projects.
- If gender is a key issue, include an specific Work Package on gender.
- Tool: http://www.rri-tools.eu/

Diversity and Inclusive measures: refugees; researchers with disabilities, etc

GOBIERNO DE ESPAÑA — MINISTERIO DE CIENCIA E INNOVACIÓN

FECYT INNOVACIÓN

Agència de Gestió d'Ajuts Universitaris i de Recerca — AGAUR

Generalitat de Catalunya Departament de Recerca i Universitats

1.2. SUBHEADING OPEN SCIENCE PRACTICES

Open Science

Open science is an approach based on **open** cooperative work and systematic **sharing of knowledge and tools** as early and widely as possible in the process. Including active **engagement of society**

Components of Open Science

- **Mandatory immediate Open Access to publications:** beneficiaries must retain sufficient IPRs to comply with open access requirements;

- **Data sharing as 'open as possible, as closed as necessary':** mandatory Data Management Plan for FAIR (Findable, Accessible, Interoperable, Reusable) research data

- **Engagement of Society**

1.2. OPEN SCIENCE OPEN ACCESS

Open Research Europe

Rapid & Transparent Publishing Platform
Fast publication and open peer review for research stemming from Horizon 2020 funding across all subject areas.

- **Mandatory immediate Open Access to scientific publications**: beneficiaries must retain sufficient IPRs to comply with open access requirements;

- **Hybrid journals** are not an eligible cost

- **Open science practices** include measures related to:

✓**Early and open sharing** of research (for example through preregistration, registered reports, pre-prints, or crowd-sourcing);

✓**Reproducibility of research outputs;** providing open access to research outputs (such as publications, data, software, models, algorithms, and workflows)

✓´**Open Access:** Provide specific information on how you will meet the OA requirements (repository, type of open licenses, etc

✓Participation **in Open Peer review, if possible**.

RESEARCH DATA – OPEN BY DEFAULT

FAIR DATA!

Accessible   **I**nteroperable

Findable   **R**e-usable

- Mandatory **Da**
storage/reposit

- **As Open as Pos**

- **Exceptions to**
constraints)

- Data should be

- **Applicants** gen
publications) d
will be managed in line with the FAIR principles.

➢ Types of data/research outputs/research outputs (e.g. experimental, observational, images, text, numerical) and their estimated size; if applicable, combination with, and provenance of, existing data.

➢ Findability of data/research outputs: Types of persistent and unique identifiers (e.g. digital object identifiers) and trusted repositories that will be used.

➢ Accessibility of data/research outputs: IPR considerations and timeline for open access (if open access not provided, explain why); provisions for access to restricted data for verification purposes.

➢ Interoperability of data/research outputs: Standards, formats and vocabularies for data and metadata.

➢ Reusability of data/research outputs: Licenses for data sharing and re-use (e.g. Creative Commons, Open Data Commons); availability of tools/software/models for data generation and validation/interpretation /re-use.

➢ Curation and storage/preservation costs; person/team responsible for data management and quality assurance.

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FECYT INNOVACIÓN

Agència de Gestió d'Ajuts Universitaris i de Recerca AGAUR

Generalitat de Catalunya **Departament de Recerca i Universitats**

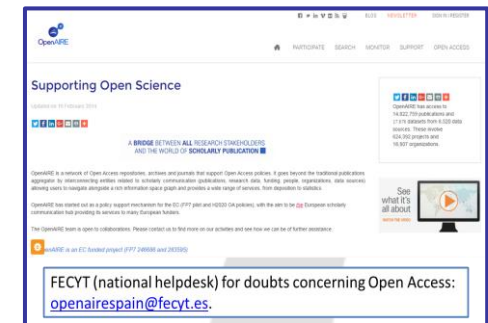# 1.2. OPEN SCIENCE OPEN ACCESS

Recommendations:

- Provide OA to **research outputs beyond publications and data** (software tools, models, apps, etc.) and share them as early and openly as possible – providing guidance for potentially interested users.

- Open Accces. both at **project a**nd **PHd project** level.

- Show **doctoral researchers** are involved in open access decisions/initiatives, both publications and dat´.

- Include references to specialized entities' **Open Access Units, experts, policies, initiatives**, etc

- Justification is needed in case you believe that none of these practices are appropriate for your project.

Information and contains links to further information
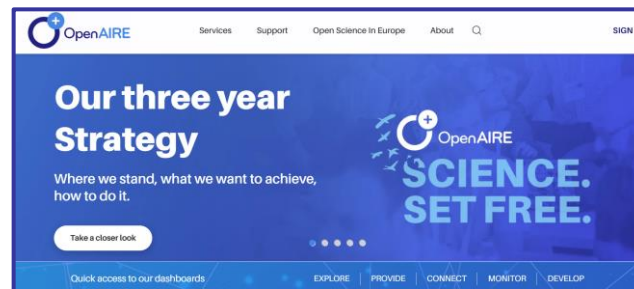
Guides, factsheets, use cases, webinars, and a helpdesk for all Framework programme participants.

Fecyt Helpdesk (Spanish participants)

1.2. OPEN SCIENCE ENGAGEMENT WITH SOCIETY

MAKING RESEARCH RESULTS
WORK FOR SOCIETY

ENGAGING CITIZENS TO ACCELERATE USE OF RESEARCH RESULTS TO BENEFIT ALL

@EUScienceInnov #Valorisation
#CitizenEngagement #ResearchImpactEU

European Commission

- **Involving all relevant knowledge actors** including citizens, civil society and end users in the co-creation of R&I agendas and contents (such as citizen science)
- Citizen-Science; Multiactor approach; Co-creation; Cross-fertlisation; End-used; Outeach Activieties; Mutual learning.

Joint activities (such as workshops, focus groups or other means to **develop R&I agendas, roadmaps and policies**);

co-creation activities (involving citizens and/or end-users directly in the development of new knowledge or innovation, for instance through citizen science and user-led innovation);

Co-assessment activities (such as assisting in the monitoring, evaluation and feedback to the governance of a project, projects, policies or programmes on an iterative or even continual **basis**).

- Good practice: "To achieve the aim of maximising the project impact, the project has foreseen mechanisms that include the early stakeholders' engagement and the co-creation approach".

eu-citizen.science

Welcome to the platform for sharing citizen science projects, resources, tools, training and much more

Link

1.2. SUBHEADING ARTIFICIAL INTELLIGENCE

Trustworthy Artificial Intelligence

Due diligence is required regarding the trustworthiness of all AI-based systems/ techniques used or developed in projects funded under Horizon Europe.

Under Horizon Europe, the technical robustness* of the proposed AI based systems must be evaluated under the excellence criterion.

(*) Technical robustness refers to technical aspects of AI systems and development, including resilience to attack and security, fullback plan and general safety, accuracy, reliability and reproducibility.

AI-based systems or techniques should be, or be developed to become:
* **Technically robust**, **accurate and reproducible**, and able to deal with and inform about possible failures, inaccuracies and errors, proportionate to the assessed risk posed by the AI-based system or technique.
* **Socially robust**, in that they duly consider the context and environment in which they operate.
* **Reliable and function as intended**, minimizing unintentional and unexpected harm, preventing unacceptable harm and safeguarding the physical and mental integrity of humans.
* Able to provide a suitable explanation of its **decision-making process**, whenever an AI-based system can have a significant impact on people's lives.

Web EC: https://research-and-innovation.ec.europa.eu/research-area/industry/key-enabling-technologies/artificial-intelligence-ai_en

1.2. SOUNDNESS OF THE PROPOSED METHODOLOGY: ESR WEAKNESSES DN 2021

- The methodology is not convincingly elaborated. It is not sufficiently clearly demonstrated, how the data will be integrated by using the proposed technologies and under different standards and requirements.
- The novelty of the methodology is not fully demonstrated. The proposal is centred around a commercial software package already developed by the coordinator and is to a large extent an application/demonstration of that.

- Interdisciplinary dimension of the project is questionable as it is mostly limited to the informatic and statistical analyses on the already available datasets. There is insufficient detail on how the proposal will ensure access to the data in ways that are accessible to a multidisciplinary set of users

- The gender dimensions of the research, especially in the experimental design, are only superficially explained.

- The proposal does not sufficiently elaborate on how it plans to comply with the mandatory open science practices, and on how it will adopt recommended practices in the methodology.
- Research data management and open science practices are not sufficiently considered. For instance, the measures to ensure reproducibility of research outputs are missing and means to adhere to the FAIR principles are not outlined.

- The proposal is not sufficiently clear regarding the alignment of the research data management with FAIR principles.

- The AI methodology is not described in sufficient detail, especially related to the specific AI-methods to be used, the underlying data, and how the quality is ensured. Furthermore, the technical robustness of the planned use of AI is not clearly outlined.

- AI is not included in training activities although required for planned research

1.3. QUALITY AND CREDIBILITY OF THE TRAINING PROGRAMME: REQUIRED SUBHEADINGS

- **Overview and content structure** of the doctoral training programme, including network-wide training events and complementarity with those programmes offered locally at the participating organisations (please include table 1).

- **Role of non-academic sector** in the training programme.

Table 1   **Main Network-Wide Training Events, Conferences and Contribution of Beneficiaries**

	Main Training Events & Conferences	ECTS[5] (*if any*)	Lead Institution	Action Month (*estimated*)
1				
2				
3				

[5] ECTS: European Credit Transfer and Accumulation System.
http://ec.europa.eu/education/ects/users-guide/docs/ects-users-guide_en.pdf.

1.3. QUALITY AND CREDIBILITY OF THE TRAINING PROGRAMME: TIPS

❑ List of training objectives including **these type of skills**:
- ✓ Core research Skills (on the job, ESR project)
- ✓ Advanced research Skills (delivered by consortium)
- ✓ Transferable Skills (delivered by consortium – skills for non-academic careers)
- ✓ **Open Science** related training modules including digital ones, fostering the culture of OS, innovation, FAIR data Management, citizen science ,…

❑ **Training to be delivered:**
- ✓ Local training: offered at the host where the ESR will work
- ✓ Network Wide training:
  - o Open up some events to the wider research community**. Typical to have a final conference for example.
- ✓ Secondment Programme: visits by each ESR to other ben./P.O. **Added value**

❑ Complementarity between local and network training achieved via **Personal Career Development Plan** (PCDP)

❑ Explore **virtual trai**ning through e-infraestructures (**GEANT**, the pan-European research and Education network)

❑ Explain the **contribution of the non-academic** beneficiaries and P.O in the training programme (delivery of some of the network-wide training, recruitment…): **use a table with their contributions**

❑ Training programme must be **Ambitious but realistic**

❑ **Triple I:** international, inter-sectoral and interdisciplinary **(EU Principles for Innovative Doctoral Training)**

❑ **Career Development Plan** (reviewed every six months)

❑ **When? Where? Content? Duration? Who will deliver it?**

1.3. QUALITY AND CREDIBILITY OF THE TRAINING PROGRAMME: TIPS

Balance between
- Individual training-through-research
- Local doctoral programme
- Network-wide training

And
- Scientific training
- Transferable skills training
- Inter-sectoral exposure

Deliver your skills training through two modes:

Local Training

Offered at ESR's main host e.g. Graduate Schools

Network-wide training

Specific network events workshops, summer schools

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DOCTORAL NETWORKS
HANDBOOK
CALL 2022

LOCAL TRAINING	• Offered at the main host organisation where the doctoral candidate will work. Include a description of the Individual Research Programme and the structured training (research training) offered by, for example, local graduate/doctorate schools. • Describe other specific opportunities and trainings offered by the host organisation (e.g., ethics, research integrity, gender, open science) and transferable skills training. It would be positive if training available at one host was open to doctoral candidates from the other hosts in the consortium.
NETWORK WIDE TRAINING	• Offered by the consortium at specific events, e.g. workshops, summer schools, training weeks, training during the secondments. • Be very specific about the details - when and where it will take place, what areas will be covered, how long will it last, who will deliver the training. You can include extra tables to show a fuller description of all the trainings.

1.2.3 Network-Wide Training Events

Table 1.2b   Network-Wide Training Events

Event	Transversal skill	Partner	Month
School 1	Team work Lab. practises and OHS		9
School 2	Scientific writing Clinical trials		13
Hands on training module 1: Time-resolved Fluorescence			13
Hands on training module 2: Time-resolved Microscopy			13
Workshop 1	Oral presentation		19
Hands on training module 3: Ophthalmic Imaging Instruments			19
Hands on training module 4: Clinical Ophthalmic Diagnosis Techniques			19
Workshop 2 (co-located with the mid-term meeting)	Online tools		24
Workshop 3	IP & Entrepreneurship		30
Workshop 4	CV writing and job interviews		36
Final Conference			42

XXX   will organize 2 schools, 4 workshops, 4 hands-on modules and a conference. These events are timed in order to take into account **three phases** (see Gantt Chart):

– An initial **recruitment and planning phase** when the ESRs are become familiar with their projects and the host institutions (about the first 2 months of each ESR contract).
– A **training phase** when the ESRs acquire the skills they need for the success of their projects (months 3-30 of each ESR contract).
– A final phase devoted to **thesis completion** (the last 6 months of each ESR contract).

As all the ESRs are expected to be recruited by month 7 of the project (**milestone 5.4 in Table 3.1c**), the training phase, when the schools, workshops, hands-on modules and secondments are scheduled, will take place within months 9-36 of the project.

The core of the two **five-day schools** will be a series of **interdisciplinary courses** presented by members of   , which are experts in their fields, as well **as external invited lecturers, who will complement the network's training capacity**. They will present **introductory courses** (first school) and **intermediate courses** (second school). The courses will have **at least 6 hours of lectures** on (S1/S2 indicates first/second school):

– **Introduction to Biophotonics** (S1): interaction of light with cells & tissue, optical biosensors, optogenetics, lasers for bio-manipulation, tissue engineering. Lecturers:

– **Biomedical Imaging** (S1): overview of biomedical optics, light sources, detectors, substrates and optical components for biomedical imaging, illumination and imaging system design and modelling, different imaging modalities, the pros and cons of commercially devices. Lecturers:

– **Tissue Optics** (S2): light transport in tissue, measurement and analysis of reflectance and fluorescence spectra, modelling and video techniques, laser therapy. Lecturers:

– **Introduction to cardiac electrophysiology and optogenetics** (S1): excitable media, spiral and scroll waves, phase singularities and filaments, wave breakup and spatio-temporal chaos, mathematical models of cardiomyocytes, mono and bidomain modelling, heterogeneities and virtual electrodes, optical mapping of membrane potential and Ca concentration. Lecturers:

– **Super-resolution Optical Technologies** (S2): overview of different imaging modalities (SOFI, PALM/STORM, STED) and detection approaches, imaging devices such as microscopes, hand held probes and catheters, *in vitro* and *in vivo* studies. Lecturers:

– **Statistics, data analysis and classification tools** (S2): linear and nonlinear time series analysis, delay reconstruction, ordinal patterns, support vector machines, nearest neighbours classifier, feature selection, surrogate data and hypothesis testing, information flow, statistics for clinical studies (t-test, ANOVA, Bland and Altman plots etc). Lecturers:

Following the schools, the network will organize **four three-day workshops** that will take place about every six months. They will have a regular scientific program, with talks given by **selected invited speakers**. They will include oral contributions by the ESRs and a poster session. The workshops will provide the ESRs with intensive training in presentation skills.

At least one training session on a transferable skill will be organized in each school or workshop. The timing (see Table 1.2b) is such that the ESRs can start using the skills. Also, during each school or workshop a **social outdoors activity** will be organized to promote friendships among the ESRs that will foster future collaborations. In addition, in each school

Inici > Internacional > EURAXESS Catalonia > Eines per al desenvolupament professional

Eines per al desenvolupament professional
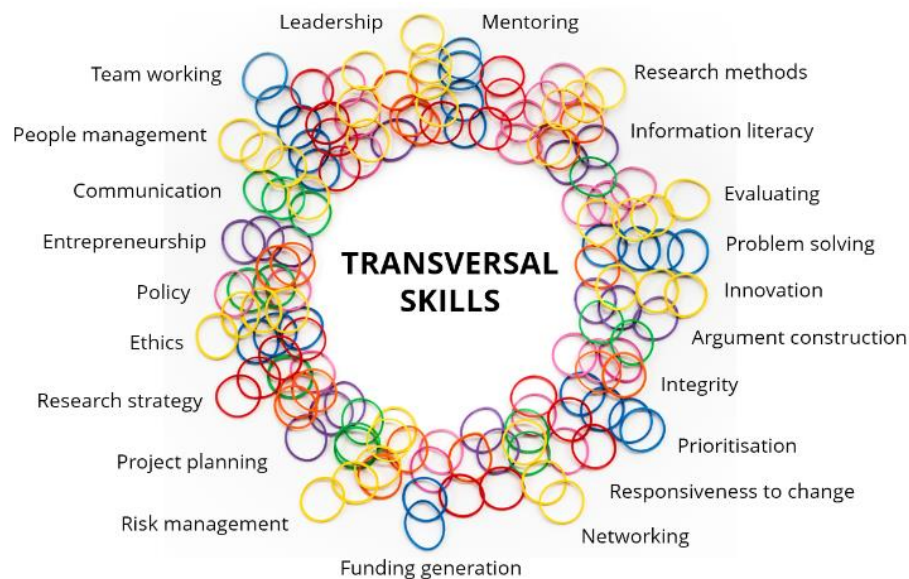
PIPERS Career Kit ⌕

VITAE RDF ⌕

Oportunitats a Euraxess Jobs ⌕

Segell "HR Excellence in Research" a institucions catalanes ⌕

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Per més informació contacteu a mobilitat.agaur@gencat.cat

Transferable Skills in Knowledge and Intellectual abilities
Research methods : theory and practical application
Language training
Academic literacy and numeracy
Analysing and Synthesising
Problem solving
Creative thinking
Out of the box thinking
Innovation
Argument construction
IT skills / software packages
Knowledge and information management
Marketing
Patent writing skills
Scientific communication / presentations
Scientific poster making
Scientific article writing
Project website contributions

Transferable Skills in Engagement, influence and impact
Team working
People management
Conflict management
Supervision and Mentoring
Teaching skills, didactical skills
Influence and leadership
Communication methods
Cross-sectoral (e.g. industry-academia) communication and collaboration
Intercultural communication and collaboration
Interaction with the media
Public engagement, Scientific outreach activities
Research policy issues
Negotiation skills
Networking techniques

Transferable Skills in Personal Effectiveness
Research Integrity
Responsibility
Preparation and prioritisation
Time management
Work-life balance
Career management
Responsiveness to opportunities
Networking
Leadership skills
People management
Personnel management
Supervision skills
Chairing (scientific) meetings
Entrepreneurship
CV writing and job interview techniques
Management skills (e.g. Supervisory Board)
Organisational skills
Presentation skills

Transferable Skills in Research Governance
Health and safety
Ethical issues related to research
Legal requirements, standards
IPR (Intellectual Property Rights) issues
Respect and confidentiality
Research strategy
Project management, project planning and delivery
Risk management
Financial management
Proposal writing, fundraising
Financial management
Setting up a spin off
Commercialisation of research results
Entrepreneurship
Business administration

1.3. QUALITY AND CREDIBILITY OF THE TRAINING PROGRAMME : ESR WEAKNESSES – DN 2021

- The training activities are not satisfactory elaborated. The training in transferable skills is not convincingly demonstrated to be complementary to the training events offered locally at the participating organisations.

- Gender and other diversity aspects are insufficiently considered in the training programme

- Some quality standards are not addressed; for example, ECTS points to be given for courses is incompletely described.

- The number of courses and the complexity of their topics is excessive and may not be realistic. The doctoral candidates will have to conduct their research in addition to attending all these courses and might not have time to do all of this, considering the duration of these projects

- The added value of some non-academic partners in the training programme is not sufficiently demonstrated; part of what is offered by the private company overlaps with what already exists from the academic beneficiaries

- The role of the non-academic sector in the training is modest. The secondments in the non-academic partners are too short to be meaningful and not all DCs will be exposed to intersectoral secondments.

- The training programme insufficiently covers interdisciplinary and inter-sectoral aspects

1.4. QUALITY OF THE SUPERVISION: TIPS

✓ Collective quality and experience of the research supervisors, adecuacy of their profiles (nº of PhD graduated, nº postdocs mentored, expertise and publications…)

✓ Do not forget info on Associated Partners too

PI	Expertise & Publications	Supervision Experience & Leadership Roles	ESR
Prof. Jose Bagan, MD, DDS, PhD (UVEG)	Oral medicine and pathology, discovery of novel biomarkers for treatment of OSCC; 326 publications	43 PhDs completed; 3 PhDs in progress; Head of Stomatology and Maxillofacial Surgery; Coordinator of Doctoral Programme in Clinical Dentistry; Director of research and teaching at University General Hospital in Valencia; Director of the School of Doctoral Programmes for UVEG	1, 3
Prof. Richard Kennedy, MB, BAO, Bch, BSc, PhD, FRCP (QUB)	Medical oncology and drug discovery, 90 publications	10 PhDs completed; 6 PhDs and 4 clinical fellows in progress; Director for undergraduate academic training in medicine	2, 4

✓ Identify the board that will coordinate the supervision activities

✓ Ensure it is very clear who will supervise each doctoral candidate

✓ Joint supervision compulsory for ID and JD, but recommended too for DN

✓ Career Development Plan

✓ Clear monitoring and feedback mechanisms in place

✓ Best practices: 2 – 3 supervisors

✓ Think in advance about conflict resolution

DN 2022: CHARTER AND CODE

MSCA-NET
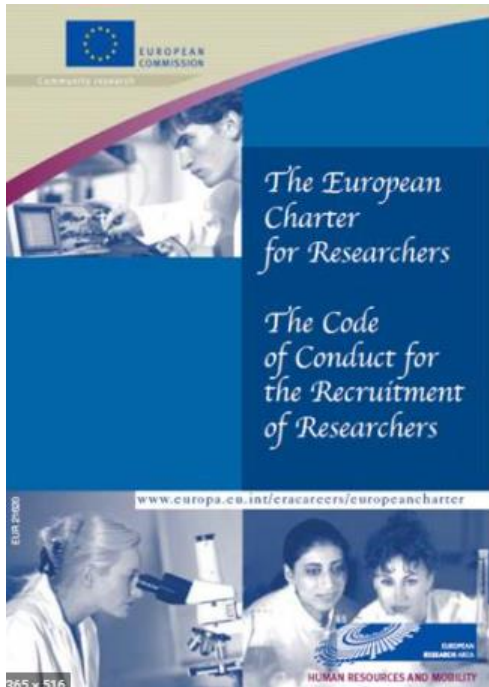
MSCA beneficiaries must ensure adequate supervision or mentoring and appropriate career guidance!

Researchers' training, skills and career development (all stages of career)

Attractive working and employment conditions

Good supervision

Creating a supportive environment for researchers and staff involved in MSCA projects

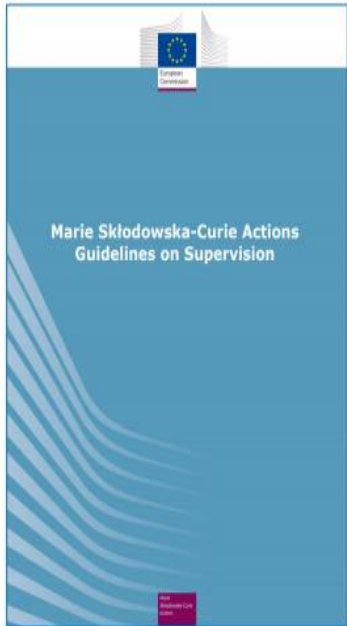High importance for career advancement

| Guiding | Mentoring | Supporting | Directing | Advising |

DN 2022: GUIDELINES ON SUPERVISION

Marie Skłodowska-Curie Actions Guidelines on Supervision

[Marie Skłodowska-Curie actions guidelines on supervision - Publications Office of the EU (europa.eu)](europa.eu)

- Appropriate level of supervision depends on the career stage of both parties and the expectations of the project
- Supervisors need to be committed and involved for the full duration of the fellowship
- Make sure the supervisor is on board with the career development plans
- 4 Levels
  - **1. Role of the supervisor**: General principles and integration of the researcher, Research support, Career development, Mentoring and wellbeing of the researcher, Communication and conflict resolution
  - **2. Role of the researcher**: General principles, Research, Wellbeing, Communication and conflict resolution
  - **3. Role of institution**
  - **4. Training and professional development for supervisors**

1.4. QUALITY OF SUPERVISION: ESR WEAKNESSES – DN 2021

- Details of how the supervisors will be assigned to individual DCs and how the personal interactions between DCs and their supervisors will take place are not outlined in sufficient detail.
- Details on how all Doctoral Candidates will get additional co-supervisors from the consortium, PIs and co-mentors from the non-academic sector, are insufficiently addressed.
- Feedback mechanisms for supervision are not sufficiently described and specific information about doctoral candidates' and supervisors "frequent meetings" is unclear.

- The role of the industrial co-supervisor in the progress monitoring mechanisms at the local level is not articulated in sufficient detail.
- The description of co-supervision practices for secondments, and especially for the ones involving supervisors from the industrial sector, is not sufficiently detailed.
- Some aspects of the joint-supervision are not detailed. For instance, the progress monitoring aspect and the time commitment of supervisors, are not sufficiently elaborated.

DN 2022: IMPACT

2.1. Contribution to structuring doctoral training at European level and strengthening European innovation capacity

2.2. Credibility of the measures to enhance the career perspectives of researchers and contribution to their skills development

2.3. Suitability and quality of the measures to maximise expected outcomes and impacts, as set out in the dissemination and exploitation plan, including communication activities

2.4. The magnitude and importance of the project's contribution to the expected scientific, societal and economic impacts

2.1. CONTRIBUTION TO STRUCTURING DOCTORAL TRAINING AT EUROPEAN LEVEL AND STRENGTHENING EUROPEAN INNOVATION CAPACITY: REQUIRED SUBHEADINGS

a) **meaningful contribution of the non-academic sector to the doctoral training**, as appropriate to the implementation mode and research field, this could include (non exhaustively) e.g. meaningful exposure of Doctoral Candidates to the non-academic sector through secondments, contribution of the non-academic sector to the research and the transferable skills training

b) **Developing sustainable elements of doctoral programmes after the end of the DN funding**, this could include (non exhaustively) e.g. sustainability of training programmes at local or network-wide level, sustainable cooperation and secondment opportunities, sustainability of transferable skills training offering, sustainability of researchers recruitment according to the code of conduct for the recruitment of researchers

2.1. CONTRIBUTION TO STRUCTURING DOCTORAL TRAINING AT EUROPEAN LEVEL AND STRENGTHENING EUROPEAN INNOVATION CAPACITY: TIPS

Meaningful contribution of the non-academic sector to the doctoral training

Developing sustainable elements of doctoral programmes after the end of the DN funding
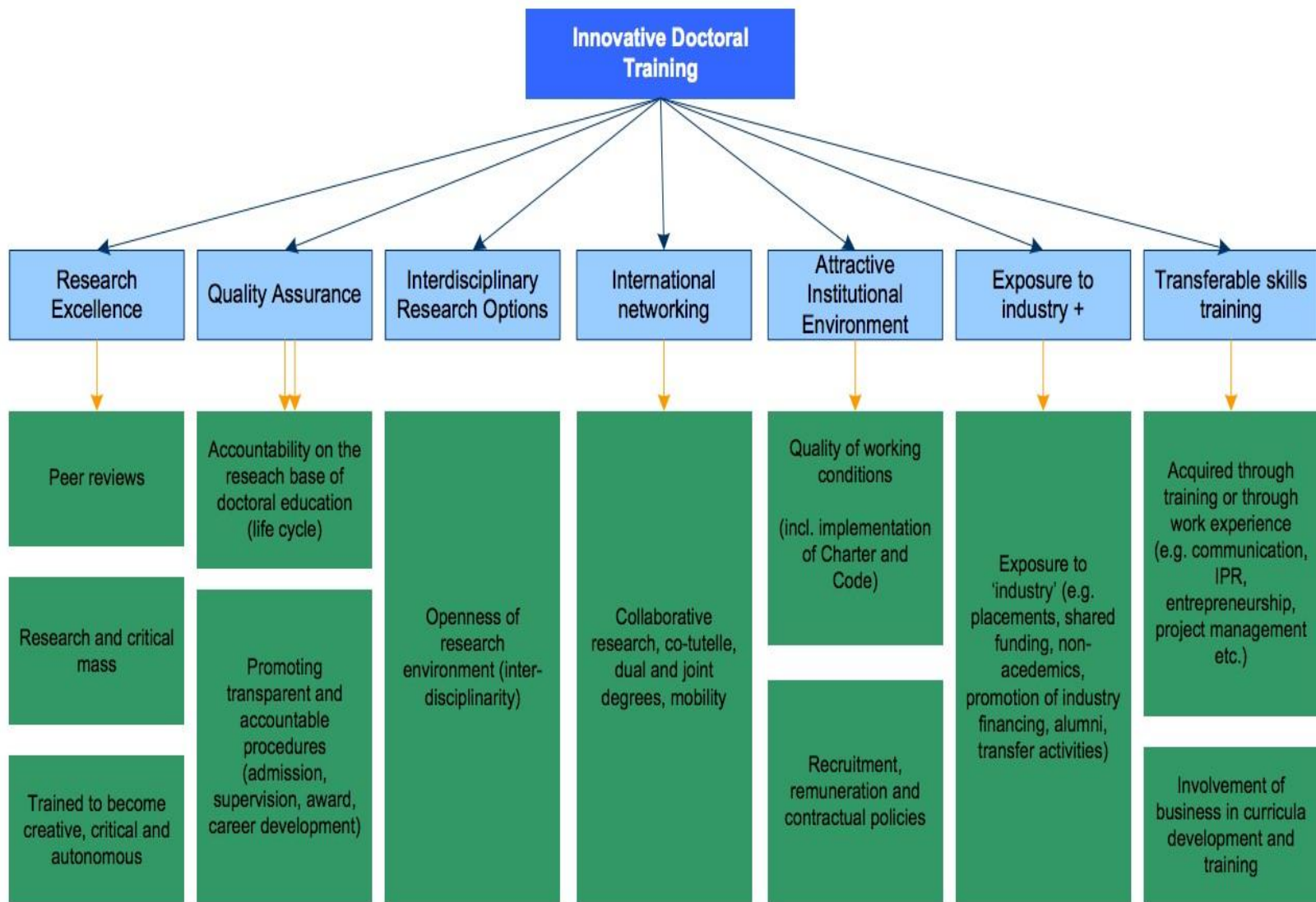
Structuring doctoral training at European level

Strengthening European Innovation Capacity

2.1. CONTRIBUTION TO STRUCTURING DOCTORAL TRAINING AT EUROPEAN LEVEL AND STRENGTHENING EUROPEAN INNOVATION CAPACITY : TIPS

- Your programme will help the further development and spreading of best practice in European collaborative research training programmes

- Harmonisation of institutional processes involved in developing joint degrees will help to bring consistency to the doctoral experience across Europe

- Demonstrate how the exposure of ALL the fellows to the non-academic sector is meaningful, i.e. it has sufficient duration and content to ensure employability of the fellows in the N.A sector

- Give examples of future non-academic career opportunities (or refer to this in 2.2.)

- Expand on link to EU research/ policy goals / SDG / Green Deal …

- Explain how the research programme and the doctoral candidate's work (including dissemination/ exploitation/communication/ outreach activities) will contribute to Europe's economy and/ or society

- Sustainable elements to go beyond the lifetime of the DN, new collaboration, JD, synergies with Erasmus+…

Source: IDT tree, by IDEA Consult based on Report of Mapping Exercise on Doctoral Training in Europe: Towards a common approach (2011). Euraxess China.

2.1. CONTRIBUTION TO STRUCTURING DOCTORAL TRAINING AT EUROPEAN LEVEL AND STRENGTHENING EUROPEAN INNOVATION CAPACITY: EXAMPLES

Contribution of the non-academic sector to the doctoral/research training

Non-academic partners will provide **state of the art training in drug design, biomarker discovery, exosome analysis, metabolism and therapeutics**. To achieve the ambitious objectives, all the ESRs will be seconded to SME/industry companies relevant to their chosen project across Europe for minimum periods of 3 months for intensive training in advanced technologies and research areas central to the   theme. The SME/industry partners have been specifically identified as leaders in their field in terms of both technology and its application to cancer research and their involvement is essential for a full and integrated training program for the ESRs.   will also **provide very useful networks of contacts to the researchers employed on the network grant for their future careers**. The specific capabilities of each SME/industry partner are incorporated into the programme overview. A potential impact of the close collaboration between the academic and non-academic partners may be the development of joint PhD programmes in future and also the exchange of other researchers between the sectors.

Structuring training across Europe

The   programme has been designed with close reference to the EU Principles for Innovative Doctoral Training[32] and it is expected that the programme will contribute to the mainstreaming of a multidisciplinary, intersectoral, structured approach to doctoral training in the   host institutions and beyond.   will provide evidence of the benefit of a multidisciplinary, intersectoral approach to PhD training to support changes in curriculum in the participating beneficiaries.   will also demonstrate that formal links between academic and industry partners in the design of multidisciplinary structured doctoral programmes at a European level are an invaluable resource in the training of future ESRs. A number of PIs in the academic beneficiaries are already responsible for doctoral curriculum design. For example,   was the Co-ordinator of the cancer stream of the very successful   PhD programme 'Molecular and Cellular Mechanisms underlying inflammatory processes' in   (2011-2015).   (   ) is Co-ordinator of the structured doctoral programme in Dentistry and is Director of the School of Doctoral Programmes for the entire   .
The consortium also plans to interact with current and future related   and research actions funded by the Commission, as described below

2.1. CONTRIBUTION TO STRUCTURING DOCTORAL TRAINING AT EUROPEAN LEVEL AND STRENGTHENING EUROPEAN INNOVATION CAPACITY: WEAKNESSES DN 2021

- The proposal fails to convincingly describe how to make Europe more competitive in the areas related to the proposed research program. For example, it is not evident how it will contribute to reduce the gap between academia and industry.

- It is mentioned that three industrial representatives will be involved but there is only one industrial partner declared in part B Section 1.

- The structuring effect for doctoral training in Europe is moderate, as there are already multiple doctoral networks with similar competence makeup, particularly in ******.

- Contribution of the project to structuring training at the EU level is poorly described. Potential synergies with other research programmes and with public/private partnerships are mentioned without a formal commitment (e.g. planned meeting, or co-activities).

- The proposal contains insufficient details on how the project will develop sustainable elements of doctoral and postgraduate programmes.

2.2. CREDIBILITY OF THE MEASURES TO ENHANCE THE CAREER PERSPECTIVES OF RESEARCHERS AND CONTRIBUTION TO THEIR SKILLS DEVELOPMENT: SUBHEADINGS REQUIRED/ TIPS

Explain the impact of the research and training on the fellows' careers

- Potential employment sectors that the doctoral candidates might end up working in: both academic and non-academic career opportunities (refer briefly to 2.1)

- Analysis of how the elements of the programme will make them employable in these sectors: Research Training / Transferable Skills Training / Secondments and/ or other opportunities for exposure to other organisations (e.g. networking opportunities) / Communication/ Dissemination/ Public Engagement/ Exploitation activities

- Focus on the impact of the skills DC will obtained coming from the Excellence section

- Strong link between the DN elements, the EU policies about researcher careers/ employability, and any sectoral policies referring to a skill gap in the relevant sector.

2.2. CREDIBILITY OF THE MEASURES TO ENHANCE THE CAREER PERSPECTIVES OF RESEARCHERS AND CONTRIBUTION TO THEIR SKILLS DEVELOPMENT: WEAKNESSESS DN 2021

- The long term career plan of the researchers is not adequately detailed (e.g. how the new high competences and skills the ESRs acquired will benefit their future).

- The needs of the job market and the way the trained researchers will fit to those is not fully clear.

- The measures to enhance career perspectives and employability of the DCs are poorly described.

- Insufficient detail is provided on how specific research skill and expertise, coupled with transferable skills that will be received during the training programme, will enhance their career perspective either in academic or non-academic sectors

Required sub-headings:

- **Plan for the dissemination and exploitation** activities, including communication activities. (*a more detailed plan will need to be provided as a mandatory project deliverable submitted at mid-term stage*)
- Strategy for the management of **intellectual property,** foreseen protection measures

DN 2022: Impact - What goes under 2.3

Public Engagement / Communication

- P.E engage a large audience, bring knowledge to the general public and imply interaction between sender /receiver.
- Communication requires a **clear and accessible language**
- **Possible Activities**: Science café;Marie Sklodowska Curie Ambassadors, Workshop Days, Open Doors, school visits; Public Talks, articles, E-newsletters, multimedia releases, Videos, European Researchers´ Night, EC Events, conferences, Marie Curie Alumni Association (MCAA), MSCA "Fellow of the Week" on Facebook

Activity	Target audience	When	Where	Key indicators (KPI)
Conference (provide the full name)	List the target audience that will participate at the conference	Estimated month of project when it will take place (M12, M14)	If known at the time of the project proposal application	Number of attendees, etc.

- Mention the **support of the host institution's** Education, Outreach, Communication/marketing support staff or office
- Specifically mention **training in communication, public engagement and edu**cation as part of the fellows training programme and direct the evaluator back to section 1.3.2.
- Mention **specific types of activities** fellows will take part in to communicate their results / interact / educate the general public – link to existing outreach and education programmes at the host organisations.

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

Communication and public engagement strategy of the project: This has been developed with a number of key audiences in mind, including cancer patients, future PhD candidates and the general public. Involvement of the ESRs in communication and public engagement is central to the strategy - all ESRs will be involved in a minimum of two outreach activities per year. The aim will be to raise public awareness of cancer research and more generally increase public engagement with and understanding of science, as well as developing ESRs' understanding of public interest and science-related priorities. The impact of the outreach activities for both the public and ESRs will be assessed by a number of methods, including questionnaires and interviews.

Web-based outreach activities: A project website will be created as the central online dissemination tool. ESRs will regularly contribute content to the site, as well as contribute to a six-monthly e-newsletter aimed at informing the general public about OOC and about the project findings in particular. A Wikipedia page will also be created and maintained by the ESRs. Social media accounts (Facebook, Twitter) will be created and maintained by ESRs and each will contribute to regular blog posts giving an update on their research and training activities. The impact of these activities in raising awareness will be measured by numbers of hits to the website, and reach of the social media accounts. To measure the impact on increased engagement metrics will include numbers of retweets, comments and replies.

Media: Networks within the Communications Offices of all partners will be leveraged to establish a project presence in the popular media. For example, a press release will be issued at the project kick-off. Where publications are likely to attract wider public interest, authors will work closely with Communications Offices to maximise coverage in the popular media. Many   investigators already have a proven track record in public engagement. For example,   (   ) currently has a weekly slot with a national   broadcaster. This impact will be measured by numbers of media articles and radio/television spots.

Outreach to OCC patient groups: The   research programme is of particular relevance to OCC sufferers, their families and friends. Each year,   hosts an information day for members of the Oesophageal Patient Association and the Oesophageal Cancer Fund.   (   ) will chair an outreach session at this information day (M18), where all ESRs will present their research to a lay audience. This session will educate the public about the existence of European projects to improve OOC diagnosis and treatment, while also offering ESRs with an opportunity to engage with those who may benefit from their work, potentially inspiring a deeper interest in the field of cancer research. In addition, ESRs based at   will have the opportunity to engage with the public through the   Forum - ESRs will give lab tours and talks to members of the Forum in order to promote greater public understanding and involvement in cancer research.

Outreach to secondary school students: Inspiring the next-generation of PhD candidates requires early exposure of cutting-edge science. All the host beneficiaries will be involved in outreach programmes to secondary school students. For example, currently the School of Biochemistry & Immunology,   , run a 'transition year' programme where secondary school students (15-16 years old) spend a week in laboratories within   Each secondary school student spends time participating in scientific activities and group activities with talks, quizzes and visits to other scientifically relevant sites on the   campus. Similar schemes will be set up by other beneficiaries. Impact of these outreach activities will be measured through questionnaires distributed to students before and after the events.

Science Gallery and related global network: is fortunate to have direct access to the world-leading   based in   . Since 2008, the   has attracted more than 1.9 million visitors to 34 exhibitions, ranging in theme from contagion to the future of fashion. It has recently partnered with Google to establish a global network of science galleries, modelled on the   approach to engaging young people in science.   will engage in debates and information events run by the   have considerable experience in measuring impact of science communication activities.

EU Researchers' Nights and other local events: Where possible, ESRs will participate in on-going initiatives run by the beneficiaries. For example, ESRs will participate in EU Researchers' Nights, such as those hosted by   and   . Live links between   ,   and the other beneficiaries will allow all ESRs to participate in both Nights.   led by the   , was awarded funding to host an 'EU Researchers' Night' event in 2014 and 2015. The event had over 7,000 attendees each year and features a wide range of interactive and hands-on activities for the general public that aim to challenge perceptions held by the general public about researchers, to promote research as an exciting career option, to demonstrate creativity and innovation in research across all disciplines and to show that researchers are dynamic contributors to society. It is anticipated that the event will continue to be held annually. Marie-Skłodowska Curie Fellows are central to the organisation of this event, and ESRs recruited to   at   will organise events, present their research and have representation on the Steering Committee for future EU Researchers' Nights. Similarly,   is partner in the Researchers' Night   , and every year in September,   organizes a number of initiatives dedicated to young researchers   , in which ESRs based at   will participate. Impact assessment through qualitative and quantitative measures is a key deliverable of Researchers' Nights and   ESRs will contribute to this.

Marie Sklodowska-Curie   Open Day: All ESRs will organise and participate in the Open Day (M36), helping them develop project management and event organisation skills. Attendees will include the general public and other interested lay audiences, such as patient group representatives. The event will include presentations from the ESRs on their research results, as well as open question sessions. The aim of the Open Day is to communicate the project findings and give ESRs an opportunity to develop communication skills. Impact will be measured through numbers of attendees and quality of discussions.

DN 2022: Impact - What goes under 2.3

Dissemination

- Identify the **project's outcomes** (research findings (datasets, reports), guide for policy recommendations, etc

- Consider the full range of **potential users and uses**, including research, commercial, investment, social, environmental, policy-making, setting standards, skills and educational training, …

- Target **multiple audiences**, e.g. other researchers, policy makers (can link to European excellence), industry, government science advisors, "think tanks", legislative bodies…..

- Remember that this is the **Impact section**.

  ✓ Describe the potential impact of **disseminating to these audiences** – it might be a different impact for each audience type.

  ✓ Have in mind that that dissemination and communication activities will also have an im**pact on the development of doctoral candidates' dissemination and presentation skills**.

- **Channels for dissemination** (already available; create new ones; what EC channels will be used;etc). What concrete **journal and conferences** are targeted?

- **Dissemination formats** (scentic conference, publications, newsletter, webinar, workshop, summer school, invited scientists, European etc.

Example:

Target groups (WHO)	Main type of information and outcomes (WHAT)	Dissemination channels (HOW)

Cuantificar!!!!!
Indicadores de impacto

DN 2022: Impact - What goes under 2.3
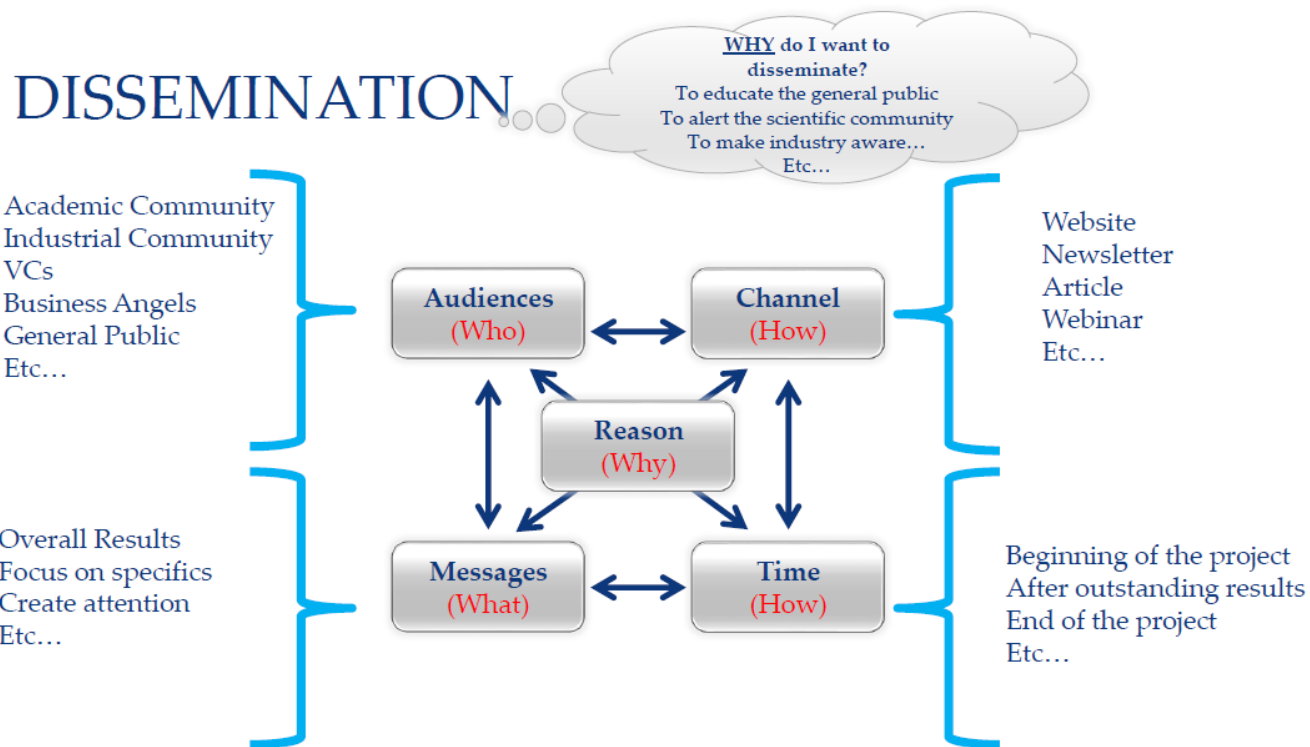
DN 2022: Impact - What goes under 2.3

Exploitation of results

- How the academic consortium members will exploit the project results?

- How the industrial consortium members will exploit the project results? Be concrete if possible with projected business figures.

- Ensuring the **sustainability and continuity** of the project: financing, synergies with other European, national or regional funds, etc.

- Describe the potential **impact of exploiting** the commercial potential of the research results.

- Include a **business plan** where relevant.

- If the results are useful to **policymakers/the wider society:**

  ✓Outline **what activities** you will engage in to ensure that relevant policymakers/societal actors (community or voluntary sector) etc. will be informed about the research results. E.g., could you organise a special workshop or information event? For health-related projects, it is advisable to include patient groups in your plans.

  ✓Some examples are provided in the JRC document **10 Tips for Researchers: How to achieve impact on policy**

DN 2022: Impact - What goes under 2.3

- Policy makers,
- Third sector
- Education community Etc

- Guidelin
- Policy Recomendations. Etc
- Education materials
- ETc

EXPLOITATION

WHY do I want to exploit my ideas? To get royalties To make a start-up To partner with industry... Etc...

Industrial Community
VCs
Business Angels
Etc...

An invention
A product
A method
A prototype
Etc...

Audiences (Who) ↔ **Channel (How)**

Reason (Why)

Messages (What) ↔ **Time (When)**

Patent
Industrial Design
Copyright
Licensing agreement
Etc...

Beginning of the project
After outstanding results
End of the project
Etc...

The why gives you the who gives you the what gives you the how gives you the when....

Source: Writing an ITN proposal- Pablo Garcia Tello; http://cerneu.web.cern.ch/writing-itn-proposal

DN 2022: Impact - What goes under 2.3

- *Dissemination*
- *Exploitation*

DN 2022: Exploitation Methods

- **Strategy for the management of intellectual property,** foreseen protection measures, such as patents, design rights, copyright, trade secrets, etc., and how these would be used to support exploitation.

  ➢Where relevant, remember that the results can and should be widely disseminated **AFTER IP protection has taken place**. Seek advice from your Technology Transfer Office on these matters.

  ➢How the **IP background** will be identified?

  ➢How the **ownership of the IP foreground (results**) will be managed?

  ➢What will happen in case of **conflict**? How it will be managed?

  ➢It is a **MSCA project**: secondments; intersectoral exchange and international dimension

  ➢If there is a **non-associated third country**, justify by explaining how the exploitation is in the Union's interest,

  ➢Briefly describe the **role of any Technology Transfer Office** or similar in helping you to commercialize the results.

Further internal research	• The results coming out of the project can be applied to further research in the field and beyond
Collaborative research	• The results can be used for building/contributing to collaborative research projects
Product development	• Results can be used for developing or contributing to a product, process, technique, design, etc.
Standardisation activities	• Results could be used to develop new standardization activities or contribute to ongoing work
Spin – offs	• A separate company will could be established as a result of the research results
Engagement with communities/end users/policymakers	• Describe the activities to ensure that relevant societal actors will benefit from your project. For example, results will be used in policy briefings to impact on policy

European IP Helpdesk - a first-line intellectual property service providing free-of-charge support to help European SMEs and beneficiaries of EU-funded research projects manage their IP in the context of transnational business or EU research and innovation programmes.

2.3. DISSEMINATION, EXPLOITATION, COMMUNICATION WEAKNESSESS DN 2021

• Given the current strenuous and rather long publication processes, the expectation of doctoral candidates to have two accepted articles by the end of the doctoral training (M48) might be slightly ambitious.

• Outreach activities to the public, health care providers, decision-makers and other actors in society are generic and insufficiently considered.

• The exploitation strategy is not sufficiently discussed, namely at the level of some of the envisaged demonstrators.

•A communication strategy specifically defined to reach the general public has not been sufficiently addressed.

•Although possible exploitation routes are outlined, the proposal lacks details related to the expected resources, coordination mechanisms of individual organisations, and level of involvement of senior staff in the possible exploitation pathways of the project results.

• Dissemination measures are not innovative and are limited to standard methods (publications, website with blog, twitter).

• A clear strategy of exploitation was not adequately organised for the results which refer to guidelines, recommendation and policy inputs. The market potential is not sufficiently described.

• Proposal does not sufficiently elaborate potential for exploitation of the research data obtained, in terms of plans for future protection, concrete collaboration with targeted industry, and possible commercialisation of research findings.

• The participation of each of the doctoral students in the communication activities is not addressed in enough detail.

DN 2022: Scientific, societal and economic impacts (2.4)

KEY IMPACT PATHWAY: Logical steps towards the achievement of the expected impacts of the project over time, in particular beyond the duration of a project. A pathway begins with the projects' results, to their dissemination, exploitation and communication, contributing to the expected outcomes in the work programme, and ultimately to the wider scientific, economic and societal impacts of the work programme destination

Scientific impact
Promote scientific excellence, support the **creation and diffusion of high-quality new fundamental** and **applied knowledge**, skills, training and mobility of researchers, attract talent at all levels, and contribute to full engagement of Union's talent pool in actions supported under the Programme.

Societal impact
Generate knowledge, strengthen the impact of R&I in developing, supporting and **implementing Union policies**, and support the **uptake of innovative solutions in industry**, notably in SMEs, and society to address global challenges, inter alia the SDGs

Economic impact
Foster all forms of innovation, facilitate technological development, demonstration and **knowledge transfer**, and strengthen deployment of innovative solutions

- Provide a **narrative** explaining how the project's results are expected to make a difference in terms of impact, beyond the immediate scope and duration of the project.

+ environmental, Sustainable development Goals, etc

DN 2022: Scientific, societal and economic impacts

HORIZON EUROPE LEGISLATION defines three types of impact, tracked with Key Impact Pathways
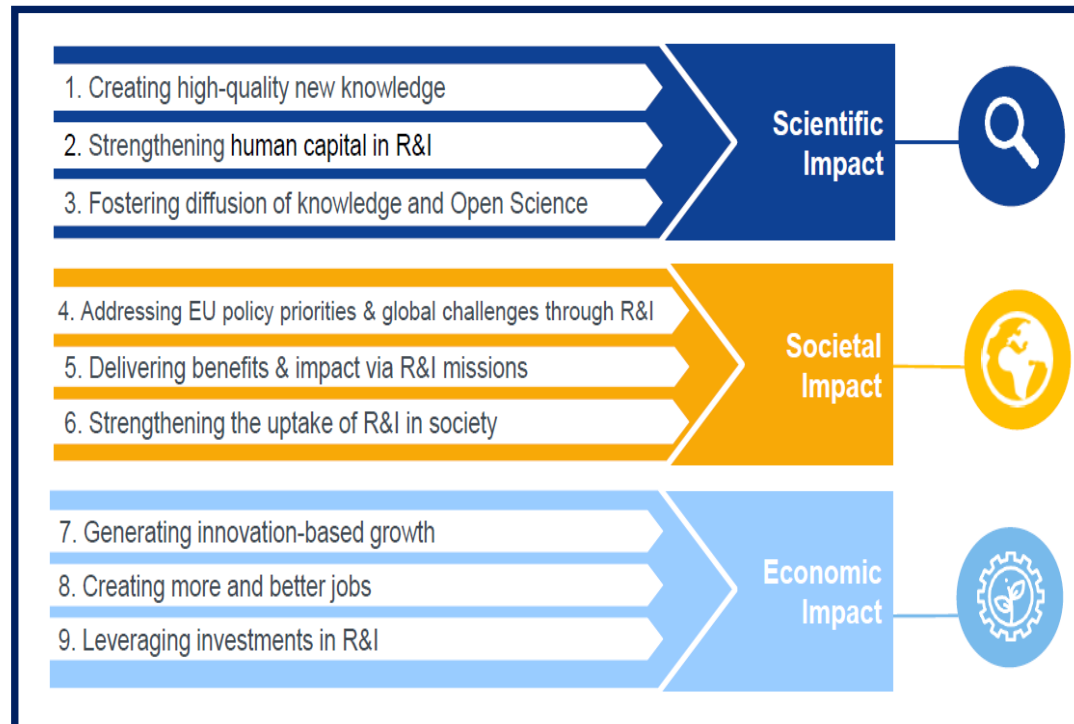
Article 50 & Annex V 'Time-bound indicators to report on an annual basis on progress of the Programme towards the achievement of the objectives referred to in Article 3 and set in Annex V along impact pathways'

DN 2022: Scientific, societal and economic impacts (2.4)

Objectives, Resources & Inputs → Activities /tasks → Outputs → Outcomes → Impacts

Planned Work   Expected results
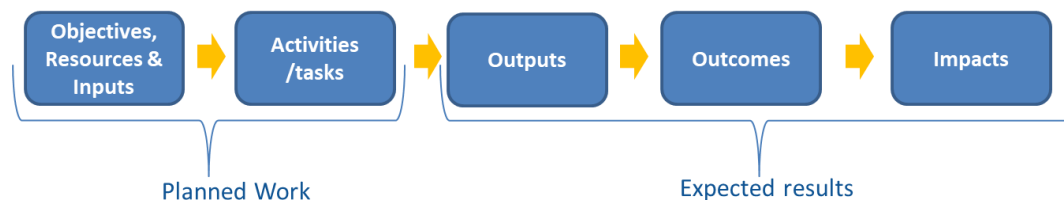
- **Ouputs (Results):** What is generated during the project implementation. This may include, for example, know-how, innovative solutions, algorithms, proof of feasibility, new business models, policy recommendations, guidelines, prototypes, demonstrators, databases and datasets, trained researchers, new infrastructures, networks, etc.
- **Outcomes:** are results that occur from creating your product or service. They are the changes in policies, people and communities that you aim to achieve with your work. Occur during or shortly after the end of the project. These statements are specific and measurable, letting you know when you accomplished your goal. Focused goal. During or Shortly after.
- **Impact:** are also results that occur from creating your product or service but occur some time after the end of the project. results that occur some time after the end of the project. Wider goal. Some time after.
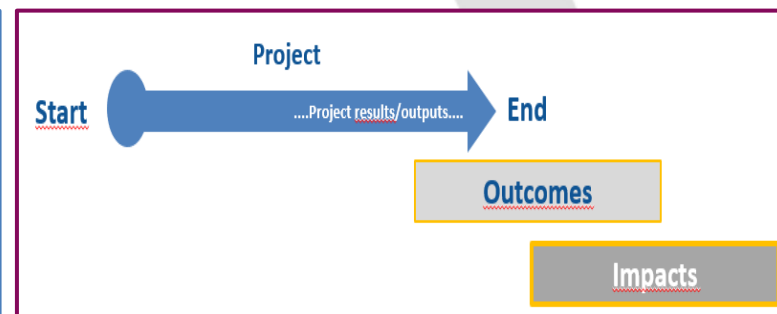
A plan for achievement the outputs/impacts beyond the immediate scope and duration of the project

- **Magnitude**: How widespread the outcines and imoacts are likely to be. Example: How many people are benefitting (ie. The size of the target group).
- **Importance:** how large the benefits for the target groups are likely to be (ie. Tones of CO_2 saved per households).

- **Target group**: who would benefit.
- Related to EU policies, Horizon Europe programme
 (ie. Missions), SDG
- **SMART:** Specific, Measurable, Achievable, Realistic and anchored within a Time Frame

DN 2022: Scientific, societal and economic impacts

Example Pilar 2. Cluster (Top-down calls)

DN 2022: Scientific, societal and economic impacts

- Explain how the research programme and the doctoral candidates' will contribute to Europe's economy and/or society – not just in terms of the research impact (how does the DN programme and individual projects advance the field) but also in **terms of the results of the programme (e.g., a new concept of training, new approach, etc.).**

- If your programme **builds on an existing or a previous** MSCA ITN, COST Action or other funded project, explain how it does so. Could your research contribute to the development of a new European Standard?

- Explain how the **research and training** programme will help in bringing **ideas to market**: in terms of research commercialisation or training in entrepreneurship/tech transfer to the fellows, etc.

- Expand on a link to EU research/policy goals: **Green Deal, Horizon Europe Missions, MSCA Green Charter**, **UN Sustainable Development Goals**

- Embed your project into those overarching goals – how do they contribute? On a **very small scale** is perfectly fine. For defining SDGs, feel free to use **JRC KnowSDGs Platform** which can help you to integrate the SDGs into the Impact section of your proposal.

❖ ***Be specific,*** *referring to the effects of your project, and not R&I in general in this field. State the target groups that would benefit.*
❖ *Only include such outcomes and impacts where your project would make a **significant and direct c**ontribution. Avoid describing very tenuous links to wider impacts.*

Expected outcome	Description	Magnitude	Importance	Expected impact

+ Key Indicator

2.4. Scientific, societal and economic impacts. WEAKNESSESS DN 2021

- Given the current strenuous and rather long publication processes, the expectation of doctoral candidates to have two accepted articles by the end of the doctoral training (M48) might be slightly ambitious.

- The description of the potential scientific, technological, economic and societal impact is broad and generic without focusing on specific results generated from the proposal.

- Although the proposal addresses the expected societal and economic impacts in a good way, how the project's results will make a difference in terms of impact beyond the immediate scope and duration of the project is not sufficiently demonstrated.

- The contribution of the project to the scientific, societal and economic impacts are not sufficiently quantified with KPIs.

- The claimed economic and societal impacts are overstated in the proposal and it is unrealistic to expect their achievement within the timeframe of the action. For example, there is a very long way to practical industrial applications from developing computational prediction methodologies in projects of this size and scope.

- The description of the potential scientific, technological, economic and societal impact is broad and generic without focusing on specific results generated from the proposal.

- The investigated fields are so divergent that the societal and economic impact of the whole proposal is seemingly overestimated.

- The project's prospective influence on policy-drafting is unclear, as the proposal is not explicit enough about communication with policymakers.

DN 2022: IMPLEMENTATION

3.1. Quality and effectiveness of the work plan, assessment of risks, and appropriateness of the effort assigned to work packages

3.2. Quality, capacity and role of each participant, including hosting arrangements and extent to which the consortium as a whole brings together the necessary expertise

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- ✓ Work Packages description (table)
- ✓ List of major deliverables (table) including the awarding of doctoral degrees, where applicable (also after the end of the action)
- ✓ List of major milestones (table)
- ✓ Fellow's individual projects (table) including secondment plan
- ✓ Progress monitoring and evaluation of individual research projects;
- ✓ Implementation Risks (Table)
- ✓ Supervisory board (including gender aspects in the decision making of the board)
- ✓ Recruitment strategy (including gender aspects in the selection process)
- ✓ For DN-JD, joint admission, selection, supervision, monitoring and assessment procedures (if not applicable, please remove)

Table 3.1 a: Work Package[7] (WP) List

WP No.	WP Title	Lead Beneficiary No.	Lead Beneficiary Short Name	Start Month	End month	Activity Type[8]	Researcher involvement[9]

Definition: A work package is defined as a major subdivision of the proposed action

Table 3.1 a   Work Package Descriptions

Work Package Number	1	6-42
Work Package Title	Biomarker Discovery (research/training)	
Lead Beneficiary	UVEG (Jose Bagan)	

Objectives
(A) To train ESRs in state of the art techniques related to biomarker discovery,
(B) To identify novel panels of biomarkers for OOC,
(C) To pursue an avenue of translational research utilising identified biomarkers as therapeutic targets,
(D) To identify potential molecules for IP protection and patenting

Description of Work and Role of Beneficiaries/Partners

Task 1.1. (Lead: UVEG; Participants: TCD, NIBRT; ESR 1). Identify differences in salivary glycan profiles in different disease stages of OSCC. TCD will provide expertise in inflammatory markers analysis using flow cytometry and other immune assays. NIBRT will provide expertise in glycan analysis, ranging from isolation of salivary protein glycans through to glycan structural identification using liquid chromatography and mass spectrometry technologies.

Task 1.2. (Lead: QUB; Participants: Almac Diagnostics and TCD; ESR 2). Develop integromic biomarkers capable of predicting response to chemotherapy in early stage OAC. QUB together with Almac will analyse whole genome sequencing, methylation and microarray data aiding in biomarker discovery. TCD will functionally analyse the underlying biology of predictive classifiers.

Task 1.3. (Lead: UVEG; Participants: IME-SP; ESR 3). Develop a diagnostic test based on salivary inflammatory markers as a predictor of an OSCC patient's response to radiotherapy. IME-SP will utilise the Mesoscale discovery platform to determine the inflammatory cytokine profile of patient samples.

Deliverables
1.1 Report on correlation of salivary inflammatory & glycan markers with stages of OSCC (M24)
1.2 Report on correlation of salivary marker level with tumour control in radiotherapy patients (M24)
1.3 Report on identification of molecular signatures predictive of response to chemotherapy (M24)
1.4 Report on retrospective validation of resultant predictive classifiers (M36)
1.5 Awarding of PhD degree to ESRs 1-3 (M48)

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Deliverable: a distinct output of the action (e.g. report, document, technical diagram, software, etc.)

numbering convention: <WP number>.<number of deliverable within that WP>

Examples

D1.2: Consortium Agreement (here 2nd deliverable of WP 1)

D2.3: Report on Project Publications

D4.1: Report on Summer School 1

Scientific Deliverables						
Deliverable Number [10]	Deliverable Title	WP No.	Lead Beneficiary Short Name	Type [11]	Dissemination Level [12]	Due Date

Management, Training, Recruitment [13] and Dissemination Deliverables						
Deliverable Number	Deliverable Title	WP No.	Lead Beneficiary Short Name	Type	Dissemination Level	Due Date

*Type: **R** = Report; **ADM** = Administrative (website completion, recruitment completion, etc.);*
***PDE** = dissemination/exploitation; **OTHER** = Other including coordination*

Dissemination level: PU = Public, CO = Confidential, CI = Classified

***Recruitment Deliverables:** Including overall recruitment (e.g. advertising vacancies), Researcher Declarations on Conformity, Career development Plan, etc.*

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List of major deliverables including the awarding of doctoral degrees

Table 3.1 b   Deliverables List

Number	Delivery Title	Work Package #	Lead Beneficiary	Type	Dissemination Level	Delivery Month
D6.1	Web site and social media interfaces available	WP6	CERN	ADM	PU	6
D5.1	Initial training event completed and evaluated in order to allow for future RADSAGA generalized training	WP5	KUL	OTHER	PU	12
D5.2	"Personal Training Plans" (PPPs) and updated "Personal Project Plans" (PPPs) agreed and on internal webserver	WP5	KUL	ADM	PU	14
D6.2	Feedback collected from public lecture and discussion tables and included in remaining outreach planning	WP6	CERN	OTHER	PU	16
D5.3	RADECS short-course developed, delivered and evaluated	WP5	KUL	OTHER	PU	24
D7.2	Mid-term review, risk assessment update and status report available	WP7	CERN	ADM	PU	24
D7.3	Technical status review of all ESR projects is provided	WP7	CERN	OTHER	PU	24
D4.1	Evaluation report of 14MeV test methodology	WP4	CERN	R	PU	28
D1.1	Compendium status report on European irradiation facilities	WP1	JYU	R	PU	30
D2.1	Status report on coupled effects and predictions tools	WP2	UM2	R	PU	30
D6.3	RADSAGA support material and presentations made available for High-School teacher training	WP6	CERN	PDE	PU	30
D1.2	Technical summary report on facility dosimetry procedures	WP1	JYU	R	PU	32
D2.2	Status report on coupled effects and predictions tools	WP2	UM2	R	PU	32
D1.3	Design status report and prototype of SRAM radiation monitor	WP1	JYU	R	PU	34
D2.3	Design status report of radiation tolerant CMOS imager	WP2	UM2	R	PU	34
D1.4	Documentation of test setups practical for mixed-facilities	WP1	JYU	R	PU	36

3.1. DELIVERABLES TO BE SUBMITTED

The following deliverables will have to be submitted for grants awarded under this topic:

- **establishment of a supervisory board** of the network;

- **progress report** submitted within 30 days after one year from the starting date of the action;

- **mid-term meeting** organised between the participants and the granting authority;

- **mobility declaration** submitted within 20 days after the recruitment of each researcher and updated (if needed) via the Funding & Tenders Portal Continuous Reporting tool;

- **career development plan**: a document describing how the individual Career Development Plans have been established (listing also the researchers for whom such plans have been put in place), submitted before the mid-term meeting;

- **evaluation questionnaire** completed by each recruited researcher and submitted at the end of the research training activity; a follow-up questionnaire submitted two years later;

- **data management plan** submitted at mid-term and an update towards the end of the project if needed;

- **plan for the dissemination and exploitation of results**, including communication activities, submitted at mid-term and an update towards the end of the project.

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Milestone: control point in the action that help to chart progress, e.g. completion of a key deliverable, intermediary points where corrective measures can be taken, a critical decision point for further development etc.

For DN-JD projects, specific milestones may also be added (Agreement to deliver the joint/ double/ multiple PhD).

Examples

M 1.1: Test phase concluded

M 2.3: Map completed & published

Mandatory (added during GA preparation):
- Mid-Term meeting between REA and the consortium
- Recruitment process completed

Number	Title	Related Work Package(s)	Lead Beneficiary	Due Date	Means of Verification

Means of Verification: Show how the consortium will confirm that the milestone has been attained. Refer to indicators if appropriate.
For example: a laboratory prototype completed and running flawlessly; software released and validated by a user group; field survey complete and data quality validated.

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Table 3.1f: Individual Research Projects

Fellow (e.g. researcher1)	Host institution	PhD enrolment*	Start date (e.g. Month 6)	Duration (e.g. 36 months)	Deliverables (refer to numbers in table 3.1b)

Project Title and Work Package(s) to which it is related:
Objectives:
Expected Results:
Planned secondment(s): *Host, supervisor, timing, length and purpose*
* Enrolment in Doctoral degree(s):   **DN-JD specific:** institutions where the researcher will be enrolled to obtain a joint/double or multiple doctoral degree should be included   **DN and DN-ID:** institution where the researcher will be enrolled to obtain a doctoral degree should be included

If possible & meaningful, in the other sector

If applicable and relevant, linkages between the individual research projects and the work packages should be summarised here (one table per fellow)

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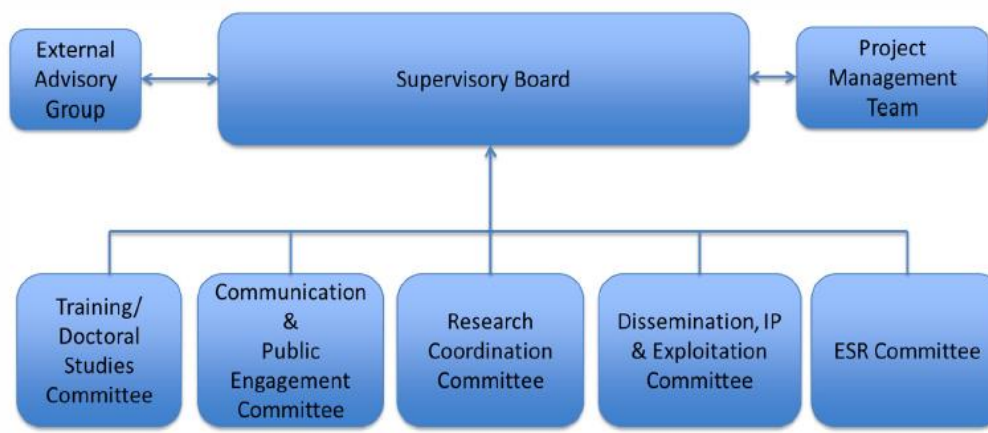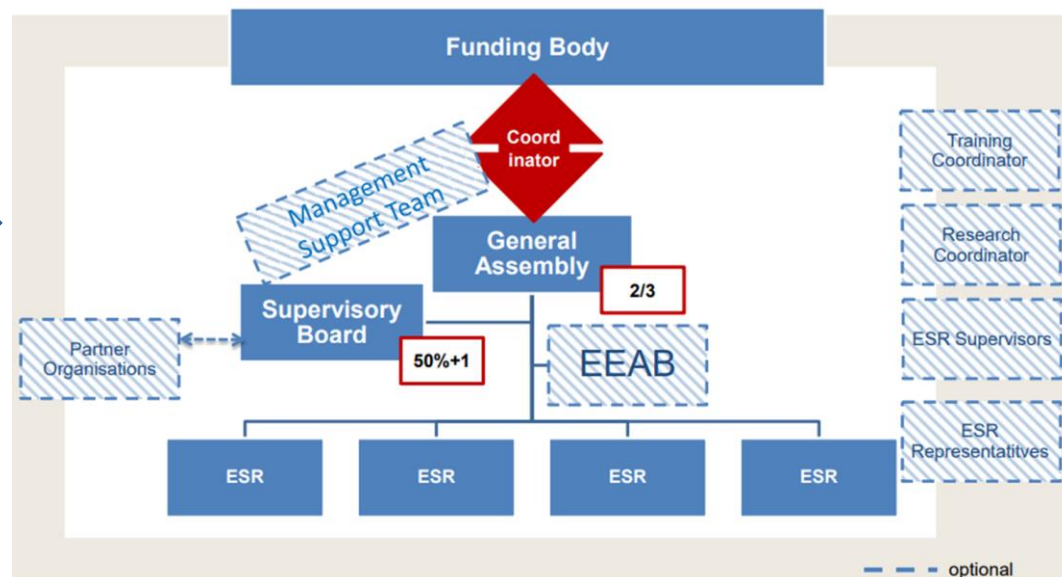
LERU Consortium Agreement Template: Governance structure

A Supervisory Board is essential.

All beneficiaries and POs represented, plus at least one doctoral candidate representative (consider rotating representation among all doctoral candidates).

This is the main decision-making body

example

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Centralised recruitment is best.

Describe the application process, applicant requirements, composition of selection committees, decision making/selection process.

Use EURAXESS Jobs and funding portal to advertise.

Explain employment conditions (employment contracts with full social security benefits are mandatory unless prevented by national legislation).

The following sections of the European Code of Conduct for the recruitment of the researchers refer specifically to recruitment and selection:

Recruitment

Employers and/or funders should establish recruitment procedures which are open, efficient, transparent, supportive and internationally comparable, as well as tailored to the type of positions advertised.

Advertisements should give a broad description of knowledge and competencies required, and should not be so specialised as to discourage suitable applicants. Employers should include a description of the working conditions and entitlements, including career development prospects. Moreover, the time allowed between the advertisement of the vacancy or the call for applications and the deadline for reply should be realistic.

Selection

Selection committees should bring together diverse expertise and competences and should have an adequate gender balance and, where appropriate and feasible, include members from different sectors (academic and non-academic, and disciplines, including from other countries and with relevant experience to assess the candidate. Whenever possible, a wide range of selection practices should be used, such as external expert assessment and face-to-face interviews. Members of selection panels should be adequately trained.

Our Recruitment Strategy

Recruitment guidelines were prepared by the **project coordinator** and distributed among the **beneficiaries**

Establishment of three-member Selection/Evaluation Committees for each ESR position (partners from **academic** and **non-academic sector**)

Advertisements of the open positions were prepared and distributed well in advance

Skype interviews and **face-to-face interviews** were used during the selection process (in various cases University committees were formed for the selection)

Source: ANSWER ITN project

Include a list incorporating research risks and project management risks. Describe practical mitigation and contingency plans for both.

Description of risk (indicate level of (i) likelihood, and (ii) severity: Low/Medium/High)	Work package(s) involved	Proposed risk-mitigation measures

A critical risk is a plausible event or issue that could have a high adverse impact on the ability of the project to achieve its objectives.
Level of likelihood to occur: Low/ medium/ high
The likelihood is the estimated probability that the risk will materialise even after taking account of the mitigating measures put in place.
Level of severity: Low/medium/high The relative seriousness of the risk and the significance of its effect.

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N.	Description of Risk	WP	Proposed mitigation measures
1	One participant is not able to full fill the plan of recruitment.	8	The remaining person months will be transferred to some other participants according to work plan needs.
2	One recruited researcher is not integrated in the hosting institution	8	The Training Committee will interact between the researcher and his/her supervisor. If solution is not found the Supervisory Board will offer the researcher the transfer to another host institution from the Network.
3	A partner may leave the consortium due to internal or external factors	8	The Supervisory Board will try to redistribute the pending research and training activities, and funding, between other Network members, and will offer the possibility to the hosted ESR to transfer to another member.
4	A milestone cannot be achieved	8	The Lead Beneficiary and the WP leader concerned have to decide about a prolongation of the task/activity time, as well as, proposing an adequate alternative milestone to the Supervisory Board.
5	Some conflicts appear along the Network, including IPR conflicts.	8	The Coordinator will intermediate between the parties. Should agreement not be reached, the conflict will be resolved by the Supervisory Board, in line with the recommendations of the EC and the Consortium Agreement.
6	Molecular recognition at high speed is not possible	2	Preliminary tests show the feasibility of this integration. Use of two pass-methods with different setting parameters will be essayed.
7	Sub-10 nm spatial resolution in dielectric composition mapping cannot be achieved	2	Preliminary calculations show the possibility to reach this spatial resolution. Use of insulated shielded probes to focus the dielectric signal can provide additional increase in spatial resolution.
8	Chemical modification of probes changes high speed performance.	3	Consortium experts in high speed AFM and probe fabrication develop jointly this task and will introduce other probe chemical functionalisations.
9	Sub-10 nm resolution in 3D doping density profiling cannot be reached.	4	Integration of the latest SMM technology and leading electronic device fabrication. Target shallow 3D tomographic doping reconstruction.
10	3D monitoring of nanoparticle cell uptake in living cells not possible.	5	3D detection in non-living cells have already been partially achieved and demonstrated. Use of partial cell fixation procedures.
11	Metrology development of validation techniques not possible.	6	Consortium experts with exceptional track records in quantitative measurement NPL offer training in uncertainty budget development.

3.1 QUALITY AND EFFECTIVENESS OF THE WORK PLAN, ASSESSMENT OF RISKS AND APPROPRIATENESS OF THE EFFORT ASSIGNED TO WORK PACKAGES: WEAKNESSES DN 2021

- The workplan is not credible. The tasks proposed are too ambitious and not credible for the duration of the project.

- The role of the advisory board is not adequately reflected in the consortium organization structure.

- The list of milestones and deliverables is not fully developed. For example deliverables related to individual projects are not clearly described, and no clear milestones are foreseen for several WPs.

- The risk analysis is significantly oversimplified and not complete

- The management structures foreseen are too complex. The proposal does not include either mechanisms for conflict resolution.

- Certain risks and mitigations are insufficiently described, such as those related to social arrangements for the Doctoral Candidates and to the risk of a Doctoral Candidate leaving the consortium

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- **Appropriateness of the infrastructure and capacity of each participating organization**

- **Consortium composition and exploitation of participating organisations' complementarities**: explain the compatibility and coherence between the tasks attributed to each beneficiary/associated partner in the action, including in light of their experience. Show how this includes expertise in social sciences and humanities, open science practices, and gender aspects of R&I, as appropriate

- **Commitment of beneficiaries and associated partners to the programme**
  - The role of associated partners and their active contribution to the research and training activities should be described
  - A letter of commitment shall also be provided

  Funding of non-associated third countries (if applicable): explain in terms of the objectives of the action why such funding would be essential

3.2 QUALITY, CAPACITY AND ROLE OF EACH PARTICIPANT, INCLUDING HOSTING ARRANGEMENTS AND EXTENT TO WHICH THE CONSORTIUM AS A WHOLE BRINGS TOGETHER THE NECESSARY EXPERTISE: REQUIRED SUBHEADINGS

- Insufficient information is provided to fully assess the infrastructure available to carry out the tasks allocated at the participating organizations.

- Mandatory letters of commitment from several associated partners are missing.

- The need to access larger EU infrastructure is not well explained.

- The key infrastructure provided in part B2 for the company XXX is not fully consistent with the work described in the proposal in WP4, task 4.4.

- The proposal lacks sufficient detail to demonstrate how the complementarities between the expertise of the members of the consortium are exploited.

DN 2022: MSCA Green Charter
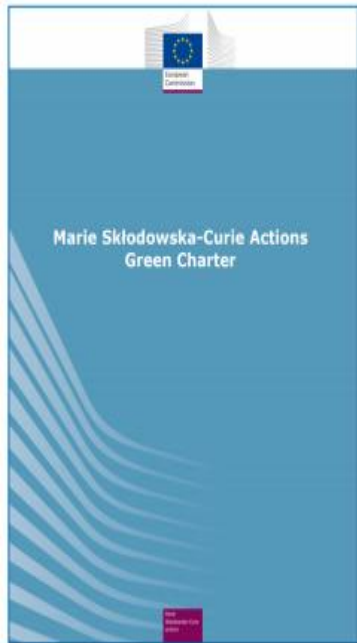
- Code of good practice for MSCA recipients
- Promotes the mainstreaming of environmental considerations in all aspects of project implementation
- Aims to:
  - Reduce the carbon footprint of MSCA projects
  - Raise awareness of environmental issues
  - Promote sustainable research management best practices
- Not an evaluation criteria as such

- 4 levels:
  - 1. Researcher-related measures
  - 2. Institutional-related measures
  - 3. Consortium-related measures (for multi-beneficiary projects)
  - 4. Outreach (applicable to MSCA researchers and participating institutions)

Marie Skłodowska-Curie Actions Green Charter - Publications Office of the EU (europa.eu)

DN 2022: General tips

About the project :

- How your Project goes beyond the state-of-the art.
- Innovative Aspects of the current state of the art, existing programmes, networks.
- Employability - Career Development of the Doctoral Candidates
- Supervision
- IMPACTS of the Project
  - Doctoral Training / Career development
  - Scientific/ Social /Economic
- Novelties of the call
  - Gender Dimension and diversity Aspects
  - Open Science
- Related to EU policies, SDG
- Synergies with other projects or programmes
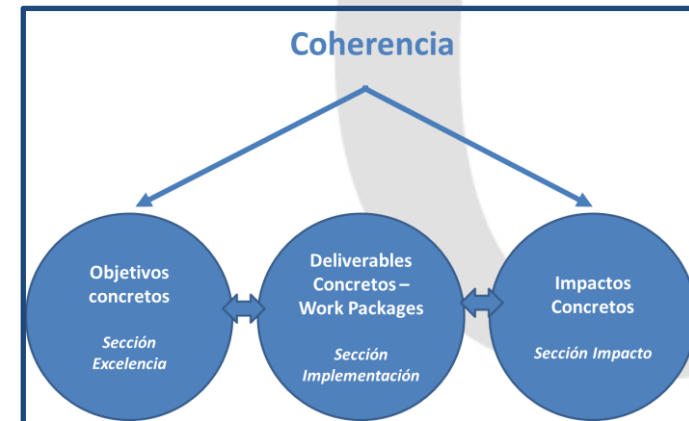
DN 2022: General tips

General Approach:

- It is a DOCTORAL NETWORK based on individual projects and its relationships

- Doctoral candidates the centre of the project.

- Concrete, Concrete and concrete

About the evaluation:

- The **weighting of criteria** is 50% -30% -20%. You need to perform at close to 100% on each

- **Follow the template** –the evaluators need to find all key points

- The reviewers may not be specialists in the field

- **"Una imagen vale más que mil palabras":** use visuals to provide global information at a glance

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