D7.3 Innovation Management Plan

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(Development and long-term sustainability of new pan-European research infrastructures)

Research and Innovation Action (RIA)

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1 Executive summary

This management plan outlines a roadmap for the long-term sustainability of the European Research Infrastructure (RI) EU-OPENSCREEN (EU-OS) as an innovation hub through industrial collaborations. The goal is to grow EU-OPENSCREEN as an RI and to ensure long-term commitment of all stakeholders by a synergistic approach with mutually benefitting projects between industry and academia and delivering novel drugs, assays and technologies to the public.

Managing these collaborations will be done in the following fashion:

1. By in-depth mapping of expertise and capabilities within EU-OS, the needs of pharmaceutical companies (including small and medium enterprises (SME), innovation initiatives and larger companies), and available funding.
2. By defining topics of interest and creation of focus groups on these topics with interested participants. (e.g. ILO members, SMEs, user communities etc.)
3. Focus groups propose co-development projects to the ILO with a roadmap and matching the topic with ILO members, EU-OS partner sites, SMEs and funding sources.
4. By setting up access and project management procedures to accommodate the application, evaluation, follow up and dissemination of industry-related projects by EU-OPENSCREEN central office and WP leads.

2 Introduction

EU-OPENSCREEN (EU-OS)[1] is the European Research Infrastructure Consortium (ERIC) for Chemical Biology and early Drug Discovery, which was established in 2018 and offers access to state-of-the-art high-capacity screening and medicinal chemistry services throughout Europe for the development of small molecule tools and lead compounds. EU-OS services are currently provided by >30 partner sites in 10 member countries across Europe (CZ, DK, ES, FI, LV, NO, PL, PT, SE and DE as host country). It operates an open-access database, the European Chemical Biology Database (ECBD)[2] hosted in Prague at IMG, and a central compound management facility (CCMF) in Berlin, Germany which stores quality controls and manages the jointly used EU-OPENSCREEN compound collection.[3]

In EU-OPENSCREEN, screening partner sites jointly use various compound screening collection in the scientific user screening projects. The largest collection is the European Chemical Biology Library (ECBL), which is comprised of about 100,000 commercially. The

[1] https://www.eu-openscreen.eu/

[2] https://ecbd.eu/

[3] https://www.eu-openscreen.eu/services/compound-collection.html

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European Academic Compound Library (EACL) is a growing collection with compounds submitted by external chemists, who wish to expose their compounds to a wide range of biological/drug targets in a transparent, regulated framework.

In 2019, EU-OPENSCREEN-DRIVE started as a European Union HORIZON 2020 project to ensure long-term sustainability of EU-OS operations by promoting measures for i) widening awareness of academia and industry for its services and data, ii) growing capacity and competence in its field across Europe, and iii) completing the management processes needed for a large, distributed infrastructure.

As outlined in the EU-OPENSCREEN-DRIVE project, ensuring the long-term sustainability of EU-OS requires a proactive attitude and a high degree of accessibility and visibility towards the involvement of private partners. With the aim to increase the scope and impact of the RI, active and focused engagement with industry stakeholders, who have different needs and motivations to work with EU-OS, becomes imperative. In this regard, the European Commission (EC) encourages RIs to proactively identify the requirements of the industry and adapt user policies and practices to accommodate these demands. This strategic approach involves the attraction of high-tech companies and specialized facilities, effectively establishing innovation hubs within each region. These local hubs serve the dual purpose of enhancing the skills of research infrastructure personnel and fostering the growth of user communities. Thus, within the framework of EU-OPENSCREEN-DRIVE, a Work Package (WP7) was dedicated to primarily setting up a permanent communication channel with the pharmaceutical industry and biotech companies, followed by the identification and execution of several joint innovative assay and drug development projects. EU-OPENSCREEN has positioned itself as a prominent innovation hub in the European pharmaceutical and biotech sector, particularly within the realm of early drug discovery.

For 2024 – 2027, EU-OPENSCREEN secured the HORIZON-INFRA-2023-DEV-01-03 project ‘IMPULSE’ to further its position as an innovation hub. This innovation management plan critically looks back at and summarizes the work that has been done in EU-OPENSCREEN-DRIVE WP7 as well as the lessons learnt, in order to guide the efforts of the future IMPULSE Work Package 8 “Engagement of Public-Private Initiatives”. It highlights the aims of industry engagement within EU-OS, the leadership structure including the lessons learned from the ILO and outlines the innovation roadmap for future public-private partnerships. In this way, EU-OPENSCREEN continues to act as an accelerator for European SMEs by providing access to novel assays and tools that they cannot otherwise acquire. This enhances the SMEs’ commitment to the ILO, to share their technology and collaborate in co-development nodes.

3 Objectives

The overarching goal of the industry engagement in WP7 was divided into the following objectives:

1. Foster communication and engagement with industry.
2. Establish continuous exchange with industry stakeholders.

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3. Enhance EU-OS' innovation management.
4. Communicate best practices in knowledge transfer.
5. Promote joint projects with industry on specific scientific developments.

4 Leadership structure

4.1 WP7 leaders

The leadership of WP7 is shared by the EU-OPENSCREEN Central Office (EU-OS) and the partner sites at University of Oslo (UiO) and University of Santiago de Compostela (USC). UiO and USC have long standing experience in stimulating public-private partnerships which was crucial to establish the necessary industry relationships and guide the scientific focus and overall management of new industry engagement within EU-OS.

4.2 The Industry Liaison Office (ILO)

The 'Industry Liaison Office' (ILO) comprises multiple EU-OS partner sites/EU-OS-DRIVE beneficiaries as well as industry representatives. The ILO serves as a discussion forum and decision-making body. The aim of the ILO is to establish and maintain a clear communication channel between EU-OS, pharma industry and biotech companies.

The ILO constitutes the following industrial partners:

Company	Representative	Specialization/area of interest
AstraZeneca	Thomas Lundbäck	CETSA and drug screening
Almirall	Arsenio Nueda	Drug discovery and development
Eli Lilly	Juan Velasco	Drug discovery and development
Faes Farma	Ignacio Sancho Martinez	Drug discovery and development
GSK	Augustin Amour	Open Innovation
Promega	Gijs Jochems	Luciferase and NanoBRET assays
Revvity	Barbara Sonnenberg	High content imaging and detection methodologies

4.2.1 Knowledge gained from the ILO workshops

During the lifetime of the EU-OPENSCREEN-DRIVE project, we have established the Industry Liaison Office with the aim of creating a permanent collaborative communication forum between EU-OS partners and interested delegates from industry partners. We have organized yearly workshops to align the capabilities and expertise of EU-OPENSCREEN with the interests and needs of industry partners, and to build a synergistic working environment.

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The first yearly workshop (2021, virtual meeting due to Covid restrictions) was dedicated to discussing the interaction/contribution of industry and EU-OPENSCREEN and identifying interesting fields of research and technologies. The EU-OS services and capabilities as well as the objectives of EU-OPENSCREEN-DRIVE were outlined to the new ILO members. During subsequent discussions, we noted that chemoproteomics, patient-derived material, MS-based screening, reactive fragments and clinical imaging are among the research areas most sought after by the industry partners and potential areas for collaborations with EU-OPENSCREEN.

In 2022, we were able to meet in-person in Santiago de Compostela, Spain. Here, the success stories and encountered challenges of the first co-development projects were presented. Subsequently, ILO members were invited to a round table discussion to present their perspectives as a big pharmaceutical company, biotechnology SME or solution provider and to share their expectations, challenges and potential solutions in collaborating with the EU-OPENSCREEN consortium in co-development projects. *Vice-versa*, EU-OS further clarified its position on what is needed from industry for a fruitful collaboration. Through this format we further discussed the potential frameworks of projects, the accessibility to EU-OS services for different stakeholders and identified research opportunities and areas of shared interests. Larger companies have screening capabilities in house, and also work with contract-research organisations (CRO) without the obligation to make the research data public. With the aim of identifying other areas for a potential to collaborate with EU-OS partners, an in-depth overview of other existing expertise within the distributed RI was requested by the ILO partners.

In parallel to the main goal of the ILO workshop, we also used the opportunity of having the ILO members in Santiago de Compostela for two additional purposes: First, a connection was made with the local Spanish Biotech community. Companies were given the opportunity to shortly pitch their specialized expertise and in turn, EU-OS explained how SMEs can engage with our consortium. Second, during the establishment of the ILO, we clarified the different positioning of EU-OS and the European Lead Factory (ELF), whose funding via the Innovative Medicines Initiative (IMI) ends in 2023. Areas of shared interests, synergies, differences in access models and data policies, and complementarities between both initiatives were explained.

In 2023, the third ILO workshop was organized in Oslo. We continued to shape co-development frameworks and discussed more explicitly the project management of EU-OS as future innovation hub (Figure 1). Following up on the discussions we had in Santiago, EU-OS presented an overview of complementary expertise available its consortium of >30 partner sites, which goes beyond screening and medicinal chemistry, and which may be of interest of industry partners. This was further highlighted in one of our industry projects from EU-OPENSCREEN-DRIVE WP5 with a focus on mass spectrometry imaging (MSI) to support a small pharmaceutical company from Poland. In addition, AstraZeneca´s open innovation platform was presented. We also used the meeting of the ILO as an opportunity, as in the previous ILO workshop, to interact with local biotech initiatives in Oslo to learn more about public-private models, challenges and solutions, but also to better understand

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how to align interests to shape future partnerships with them. In the subsequent discussion, it became clear that even though a lot of information was shared with the ILO, continued discussions with stakeholders outside of the ILO are needed. Therefore, the match-making process and the frameworks/contracts need to be clearly set up to ensure the quick accessibility of a new service. To simplify this process, we agreed to focus on projects in the pre-competitive space to avoid complicated discussions on IP. We plan to develop and validate pre-competitive and innovative technologies; assays for unprecedented targets; and assays based on patient material. The pharmaceutical industry partners and solution providers are committed to such co-developing research programs with EU-OPENSCREEN partners. In these co-development projects, EU-OS also engages with pharmaceutical SMEs with specific expertise or technologies, fostering synergistic connections between these companies and our ILO partners. Currently, we envision two different models for co-development nodes:

1. Scientific nodes: These projects are devoted to developing innovative methodologies that will improve compound screening and/or hit identification processes and will primarily serve pharmaceutical companies and SMEs.
2. Technological nodes: These programs are devoted to finalizing the validation of novel technologies by screening the EU-OPENSCREEN chemical library and will primarily serve reagents/instrumentation providers and biotech start-ups.

Figure 1: ILO workshop in Oslo at the EU-OS partner site University of Oslo (September, 2023)

For scientific and technological projects, dedicated collaborative framework agreements will be developed including rules on intellectual property, access procedures and project management (which can be node-specific). Finally, these co-development projects fit into the greater framework of the newly defined objectives for Industry Engagement within the newly funded EU project “IMPULSE”, which are the following:

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1. Foster innovation by connecting EU-OS partner sites, academics, industry, and foundations with each other in public-private partnerships (PPP);
2. Promote joint projects on defined scientific and precompetitive screening technologies or drug development campaigns;
3. Initiate alliances and new access procedures for PPP to support innovation, economic growth, and human health;
4. Enhance the long-term sustainability of EU-OS through these collaborations with private organizations.

5 Innovation Roadmap

The innovation roadmap is needed to plan and develop future potential collaborations with industry in an efficient and structured manner. Therefore, we will focus on mapping capacities and technologies of interest, further align priorities with industrial partners, establishing the correct links between stakeholders to form co-development nodes.

5.1 Mapping capacities

To streamline the identification of novel projects, a map of capacities and expertise of the EU-OS partner sites, ILO companies and SMEs will be developed by the IMPULSE WP8 leadership (Figure 2). Open Innovation plans, company specific development programs and public-private funding opportunities will be inventoried. With this information, collaborative models will be developed with feedback from the ILO members to ensure a comprehensive portfolio of highly needed expertise, technologies and resources.

5.2 Coordination meetings

To adapt to the fast-paced pharmaceutical industry, the ILO will discuss regularly to recapitulate the current landscape and redefine focus areas, if necessary. Collaborative project models will be discussed, and the framework adapted. Furthermore, focused one-to-one meetings with individual ILO members and individual partner sites will be organised to discuss specific capacities and opportunities in more detail to ensure continued commitment.

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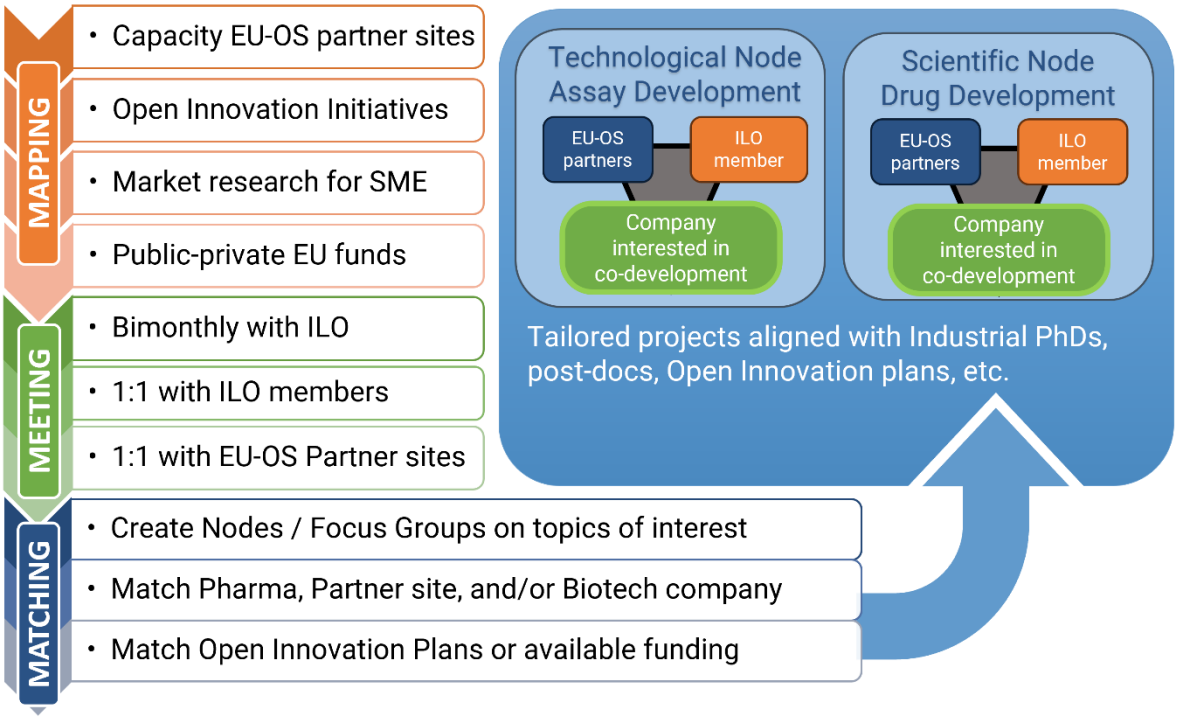

Figure 2: Flow scheme to define, execute and evaluate co-development projects. Mapping will be performed by the EU-OS central office and Industry related WP Lead and subsequently disseminated and discussed with the ILO (plenary and 1:1). After that, tailored projects will be designed by matching/aligning topic + Pharma + EU-OS partners + SME + Funding source.

5.3 Matchmaking

With all the information obtained from these mapping activities and meetings, the EU-OS Central Office and WP leaders will define areas of interest and establish dedicated focus groups for a given technology or biological/drug target. A focus group consists of the necessary actors to initiate co-development projects: ILO members, EU-OS partner sites and/or biotech companies which bring specific expertise or knowledge to the group. This allows for strengthening the already existing partnerships by matching the right parties, generating an innovative environment that yields novel drugs and technologies.

Each focus group will propose co-development projects to the ILO, which will be discussed, evaluated and executed if feasible. Projects will be tailored to the challenges of the topic and possibilities of the involved partners. We envisage two types of projects, each with their own prerequisites and purposes: Technological Nodes and Scientific Nodes. The nodes will be as small as possible (3 or 4 actors is optimal) to be effective and flexible:

1. Scientific Nodes: Research-focused projects to develop and validate novel precompetitive, innovative technologies; to develop assays for unprecedented targets; and to develop assays based on patient tissue. To mitigate the inherent risk of disruptive science, we will manage this type of projects with a roadmap with clear go/no-go decisions and milestones.

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2. Technological Nodes: Primarily intended for Technology Providers, such as Promega and Revvity, to validate novel assays with EU-OS partner sites. Screening can be performed by using EU-OS compound collections, local and/or proprietary chemical libraries. These projects need IP regulation, which normally stays with Industry, and access rules.

One example of this Innovation process in Spain are two thematic networks at local (Galician) and national (Spanish) levels, REGID (http://regid.cesga.es/) and REDEFAR (https://www.redefar.com/), respectively, which are supported by the corresponding public administrations (i.e., Galician and Spanish administrations). REDEFAR was the germ of an innovation community in Spain involving more than 140 public and private agents. This community established a map of coordinated capabilities and expertise covering all areas of drug discovery in Spain, allowing for the development of synergies and promoting an increased participation and visibility of Spain in internal and external initiatives.

6 Sustainability

Capacity mapping and 1:1 discussion with stakeholders will create long-term overview and commitment of all partners. Long-term funding will be ensured by alignment of academic efforts with private and public funding sources. Many pharma companies have for instance Open Innovation and Industrial doctorate programs, which are advantageous ways for academia to interact and collaborate with pharma in a synergistic approach. Successful collaborative projects will serve as a basis for deepening relationships, growing our network and ensuring the sustainability of our ERIC. We will actively approach SME and Pharma companies to take part in the ILO and expand our influence and role as an innovation hub.

Furthermore, by collaborating with SMEs in the biotechnology sector and involving them in co-development projects with the ILO, we act as a vital RI in chemical biology and early drug discovery. Thereby, we provide SMEs with the necessary resources and a collaborative platform to implement research projects they may not be able to execute individually. In this collaborative approach, SMEs in the biotechnology sector are seamlessly integrated into our network of innovation and expertise, enhancing their access to cutting-edge resources and fostering a culture of teamwork. By connecting these specialized professionals with our ILO co-development projects, we facilitate an environment where the combined knowledge and capabilities of multiple stakeholders can be harnessed to tackle complex challenges and pioneer new advances in the drug discovery field. This approach benefits not only individual SMEs but also contributes to the growth and development of EU-OS and the biotechnology sector as a whole, creating a win-win scenario for all involved parties.

Projects that arise through the newly established roadmap will be monitored and continuously evaluated by the ILO to maximize success and mitigate risks of failure. Instruments to regulate IP, monitor and manage the projects will be managed by EU-OS central office who has extensive experience in user access. The access rules will be aligned for the needs of the industry projects through consultation of the ILO working group to ensure efficient workflows and effective project management. Results of public-private

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partnership will be disseminated through the ILO and the EU-OS consortium with the dissemination channels established within EU-OPENSCREEN-DRIVE and EU-OS central office. The ILO will strongly promote the open access character of EU-OS and its recognition in the community, from local to national levels, though the organization and participation in webinars and workshops, for our peers in the scientific-academic and industry communities; informative and/or open doors days for the general public. Particular focus will be given to disseminate the results at conferences with industry focus such as events organized by Oxford Global, ELRIG and SLAS. This will allow to diffuse knowledge and will demonstrate the generated impact of the public-private projects. Coordinated by the EU-OS central office, knowledge transfer courses will be planned by involving Technology Transfer Offices at EU-OS partner sites as well as industry representatives with expertise in knowledge and technology transfer. These training opportunities will be open to the whole scientific community.

7 Conclusion

Here, we described our roadmap to reach the objectives outlined in EU-OS-DRIVE WP7, to engage pharmaceutical industry and biotech companies in our common quest to develop new techniques and bring new drugs to the market. The continuous refining of this workflow by the ILO was instrumental in the success of EU-OS-DRIVE, and this innovation management plan will guide future public-private partnerships. By creating an overview of the European research landscape and funding schemes, dedicated focus groups will be able to define novel projects on disruptive science and propose these to the ILO. Subsequently, the ILO has the expertise to implement, manage and evaluate these high-risk projects. Alignment with R&D budgets and Open Innovation programs of pharma will ensure long-term financing. Dissemination of the results of successful projects will grow the commitment of stakeholders, and attract new partners to the consortium, consolidating the position of EU-OPENSCREEN as an innovation hub in the European drug discovery sector.

8 Abbreviations

EU-OS: EU-OPENSCREEN ERIC - European Infrastructure of Open Screening Platforms for Chemical Biology European Research Infrastructure Consortium

EU-OS-DRIVE: EU-OPENSCREEN-DRIVE

IMG: Institute of Molecular Genetics of the Czech Academy of Sciences

USC: University of Santiago de Compostela

UiO: University of Oslo

CCMF: central compound management facility

CRO: Contract Research Organisations

EACL: European Academic Compound Library

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ECBD: European Chemical Biology Database

ECBL: European Chemical Biology Library

ELF: European Lead Factory

ERIC: European Research Infrastructure Consortium

IMI: Innovative Medicines Initiative

ILO: Industry Liaison Office

IP: Intellectual property

MSI: mass spectrometry imaging

PPP: public-private partnership

R&D: Research and Development

RI: Research Infrastructure

SME: Small and Medium sized Enterprise

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