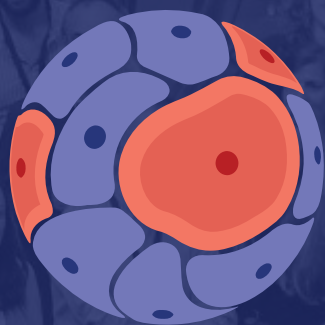




IMMUNO-model

Modelling immunotherapy response
and toxicity in cancer

COST Action CA21135 2022-2026

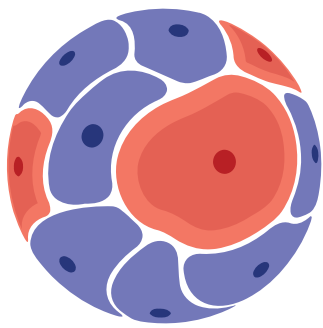
Achievements, Impact and Legacy



rvh.

design for science communication.

Booklet designed by Raquel Villar Hernández.



IMMUNO-model

Modelling immunotherapy response
and toxicity in cancer

COST Action CA21135 2022-2026

Achievements, Impact and Legacy



**Funded by
the European Union**

This publication is based upon work from COST Action IMMUNO-model: Modelling immunotherapy response and toxicity in cancer, CA21135, supported by COST (European Cooperation in Science and Technology). COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation. www.cost.eu

Words of Welcome from the Chair



When IMMUNO-model began, we set out to address a shared challenge: how to better model the complexity of cancer and its interactions with the immune system, so that preclinical research can more effectively inform the development of immunotherapies. This required bringing together people working with different models, asking different questions, and contributing complementary expertise.

For me, however, IMMUNO-model also represented a significant personal and professional challenge. This was my first experience with a COST Action, not only as a member but also as its Chair. I remember the enormous responsibility I felt at the beginning, and how overwhelming it sometimes seemed to coordinate such a diverse International network. Yet, almost without realizing it, what initially felt like a daunting challenge gradually became a natural part of my everyday professional life – and one of its most rewarding aspects.

As Chair, one of the greatest satisfactions of this journey has been seeing scientific exchanges grow into meaningful collaborations, but also witnessing the personal connections that have developed along the way. Our meetings, workshops, training schools, and scientific missions have given members the opportunity to discuss what works, recognize the limitations of current approaches, and explore new possibilities together. Young researchers have played an essential part in these activities, contributing fresh perspectives and helping shape the future of the field.

This booklet offers a glimpse of that collective journey. Alongside the activities and achievements of the Action, it captures the experiences of the people who have shaped IMMUNO-model. Much of what makes a network valuable happens between formal milestones: a conversation that changes an experiment, a visit that opens a new direction, or a connection that becomes a lasting partnership.

Looking back, I realize that IMMUNO-model has given me much more than I could have anticipated. I have had the privilege of meeting wonderful people, many of whom I am sure will remain part of my life beyond this Action. I have also established scientific collaborations that have broadened my perspective and that I believe will continue to enrich my research and help me grow professionally in the years ahead. Perhaps this is one of the most valuable lessons I take from this experience: that the true impact of a network goes far beyond its scientific deliverables. It lies in the people, the trust we build, and the opportunities that emerge when we work together.

I would like to sincerely thank all our members, and especially those who have taken on coordination, organization, and mentoring responsibilities. Your commitment, generosity, and enthusiasm have turned a shared scientific ambition into an active and supportive community. I feel genuinely fortunate to have shared this journey with you.

I must admit that I feel a certain sadness as IMMUNO-model comes to an end. After four years of working together, it is difficult to imagine that this chapter is closing. But I also know that the end of COST funding does not mean the end of what we have built. In many ways, I see it as the beginning of a new chapter — one in which the friendships, collaborations, and shared ambitions developed through IMMUNO-model will continue to evolve.

My hope is that we carry forward the openness, curiosity, and collaborative spirit that have characterized this Action, and that the work we have started together continues to bring cancer immunotherapy research closer to the needs of patients.

IMMUNO-model may be coming to an end as a COST Action, but I am convinced that the best of what we have built together is still ahead of us.

”



Eva Martinez-Balibrea

Catalan Institute of Oncology and
Germans Trias i Pujol Research
Institute, Spain

Words of Welcome from the Vice-Chair

“

Being Vice-Chair of this COST Action has been an honor and a truly enriching experience. I have had the opportunity to meet and work with dedicated scientists, clinicians, and patient advocates, and the network I have built through IMMUNO-model is something I value greatly.

The COST Action IMMUNO-model has also been an important opportunity for scientific growth. Learning from experts with different perspectives and experiences has broadened the way I approach my research and contributed significantly to my scientific development. A particularly important milestone was the successful TRANSCAN funding application ioAVATAR, developed together with partners from this network. This achievement reflects the trust, expertise, and collaborative momentum that grew within IMMUNO-model.

I am particularly proud of the creation of the Patient Engagement Task Force. Developing this initiative together with colleagues, clinical partners, and patient representatives was both scientifically rewarding and personally meaningful. It reinforced the importance of keeping patients at the center of our research and will continue to shape how I approach future projects.

What I will cherish most is the spirit of collaboration, mutual support, and genuine joy in working together, even when facing challenges. I am very grateful for this experience and look forward to continuing these connections beyond the Action.

”



Leticia Oliveira-Ferrer

University Medical Centre Hamburg-Eppendorf, Germany

IMMUNO-model

Modelling Immunotherapy Response and Toxicity in Cancer

Tumor microenvironment (TME)-preserving preclinical models are essential for advancing cancer therapies, particularly immunotherapies, whose efficacy largely depends on reactivating antitumor immune responses within the TME.

Historically, cancer research relied predominantly on tumor-cell-centered models, which failed to capture the complex interactions between cancer cells and their microenvironment. Although innovative TME-preserving models gradually emerged, their development was often fragmented, with limited coordination, harmonization and consensus across research groups.

IMMUNO-model has helped address this gap by establishing a multidisciplinary international network connecting researchers, clinicians and industry to promote knowledge exchange, methodological harmonization, training and the wider adoption of advanced preclinical immuno-oncology models.

Over four years, IMMUNO-model has evolved from an emerging network into a multidisciplinary international community dedicated to advancing preclinical models for cancer immunotherapy. Through its five Working Groups (WGs), Target Group Recruitment Committees (TGRCs), and dedicated Task Forces, the Action has fostered scientific collaboration, methodological exchange, training and inclusiveness, generating outputs and partnerships that will extend beyond COST funding.

Objectives

Research Coordination Objectives:

RC-01 | Fostering collaboration to optimize and develop preclinical immunotherapy models

IMMUNO-model connected researchers working with in vitro, ex vivo and in vivo models across solid and hematological malignancies. Scientific workshops, tumor-specific Task Forces and matchmaking activities facilitated knowledge exchange, joint publications and collaborative research initiatives. These interactions contributed to successful funding applications, including the MSCA Doctoral Network ACHILLES and the TRANSCAN-funded ioAVATAR project.

RC-02 | Advancing methodological harmonization and open knowledge sharing

The Action developed resources to facilitate the exchange and harmonization of experimental approaches, including a Springer Methods in Molecular Biology protocol book, the IMMUNO-model Method CoLab exchange channel and the open-access Knowledge Hub. Led by Young Researchers and Innovators (YRIs), the Hub provides standardized protocol templates, five published experimental protocols and a repository of Action materials. Scientific publications, including a Frontiers in Immunology special issue comprising 14 articles, further consolidated knowledge on immunotherapy models. The Action also identified persistent barriers to protocol sharing and standardization, establishing priorities for future work.

RC-03 | Strengthening knowledge transfer across academia, clinics and industry

Dedicated workshops, webinars, scientific meetings and matchmaking events promoted interactions among basic and translational researchers, clinicians, SMEs and industry representatives. The Patient Engagement Task Force, established in 2024 with patient representatives, extended knowledge transfer beyond the scientific community through educational videos, a dedicated website section and a patient-focused webinar.

Capacity Building Objectives:

CB-01 | Building a critical mass of immuno-oncology researchers

In 4 years, IMMUNO-model expanded from 34 to 544 WG participants, representing 46 countries (including 22 Inclusiveness Target Countries (ITCs)), compared with 15 countries at the proposal stage. Regular WG meetings, thematic Task Forces, conferences and training activities strengthened interdisciplinary collaboration and helped establish shared research priorities. The network's growth and the emergence of jointly funded projects demonstrate its capacity to generate scientific opportunities beyond individual institutions.

CB-02 | Promoting inclusiveness, mobility and opportunities for young researchers

The TGRCs promoted gender balance and the participation of YRIs and researchers from ITCs, through targeted events and continuous monitoring of representation. A workshop specifically dedicated to YRIs was one of their most successful activities. A total of 54 grants were awarded (€101,731), supporting international mobility, methodological training, knowledge exchange and conference participation. Among grant applicants, 78% were young researchers, 57% were from ITCs and 67% were women. These opportunities contributed to skills development, international networking and career progression, particularly among early-career researchers.

CB-03 | Establishing a reference network in immuno-oncology

IMMUNO-model strengthened its scientific visibility through publications, methodological resources, training activities and extensive dissemination efforts, including 11 webinars, newsletters, podcasts, educational videos and social media. Its long-term legacy is supported by the establishment of HARMONY, an EFIS-IL Study Group on Human-Relevant Immuno-Oncology Models, alongside ongoing scientific collaborations and funded research initiatives.

Beyond the Action: A Lasting Legacy

IMMUNO-model has transformed fragmented expertise into a connected, inclusive and collaborative European research community.

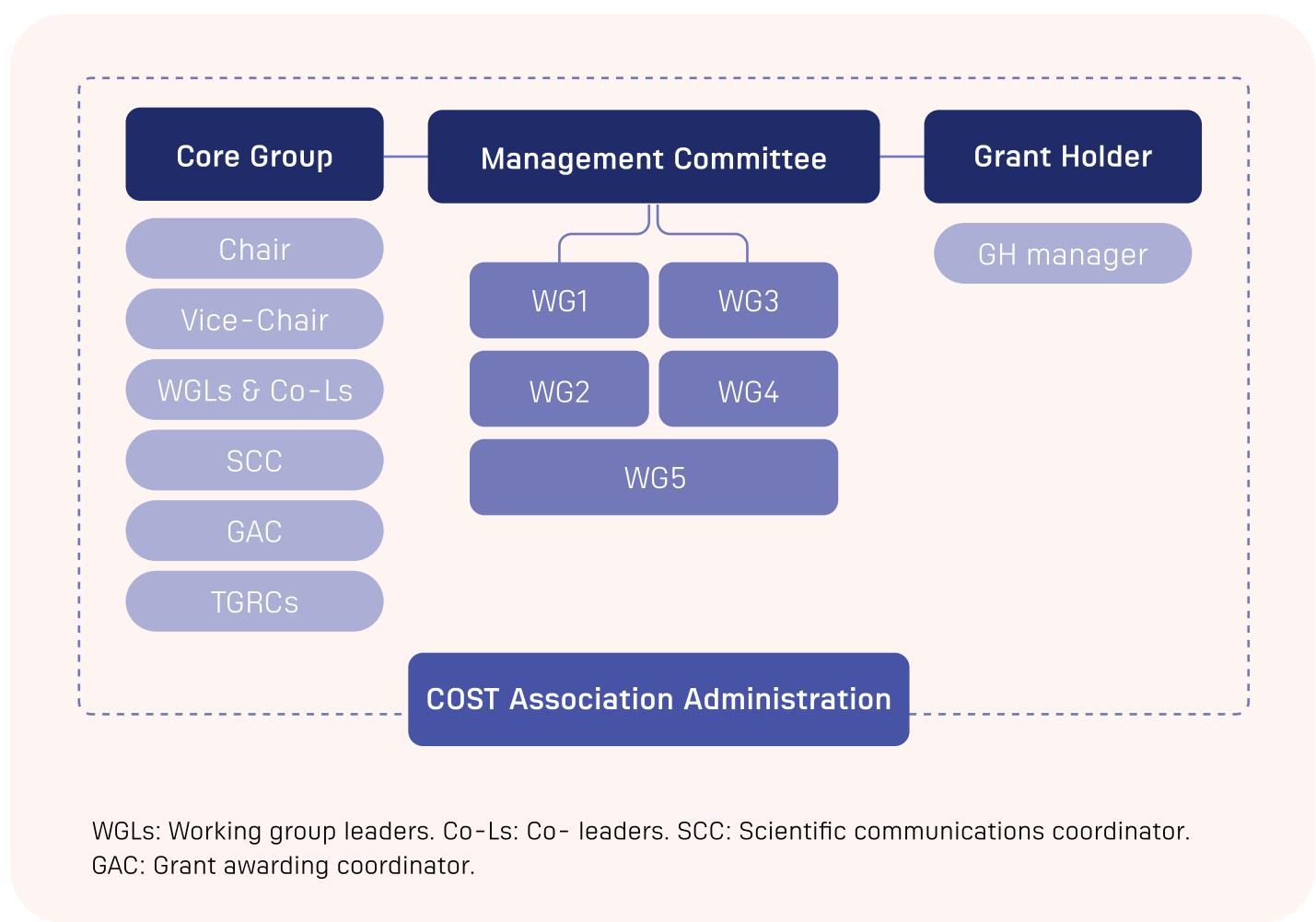
Beyond its scientific outputs and training activities, its greatest achievements lie in the partnerships, shared expertise and new research opportunities generated across countries, disciplines and sectors.

While methodological harmonization remains an ongoing challenge, the network has established a strong foundation for continued collaboration and progress in preclinical immuno-oncology research.

Composition

IMMUNO-model is comprised of:

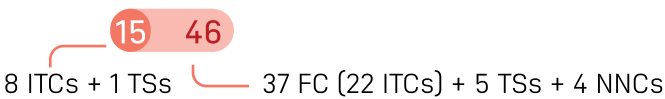
- 5 Working Groups (WGs):
- WG1** In vitro and ex vivo cancer immunotherapy models
 - WG2** In vivo cancer immunotherapy models
 - WG3** Solid tumors
 - WG4** Hematologic tumors
 - WG5** Communication, events and partnering with industry



Growth of IMMUNO-model Over the 4 Years

Pre-proposal (2022) —————> Grant period 4 (2026)

Number of countries:



FC: Full Country
ITCs: Inclusiveness Target Countries
TSs: Third States
NNCs: Near Neighbor Countries

Number of approved WG members:



Leadership



Dr Eva Martinez-Balibrea

Action Chair & Grant Holder
Scientific Representative



Prof Dr Leticia Oliveira-Ferrer

Action Vice-Chair



Dr Philippe Bertrand

Grant Awarding Coordinator



Dr Emanuela Senior

WG1 Leader



Dr Łukasz Skalniak

WG1 co-Leader

Past leadership positions: Dr Devrim Pesen Okvur, WG1 Leader, Prof Dr Cristiana Tanase WG1 co-Leader.



Prof Emmet Mc Cormack

WG2 Leader



Dr Doreen Lau

WG2 co-Leader

Past leadership positions: Dr Johannes Haybaeck, WG2 Leader.



Dr Marleen Ansems

WG3 Leader



Dr Maurizio Callari

WG3 co-Leader



Dr Laura Belver

WG4 Leader



Prof Dr Rui Bergantim

WG4 co-Leader



Dr Rosalinda Sorrentino

WG5 Leader & Scientific Communications Coordinator



Dr Barbara Breznik

WG5 co-Leader

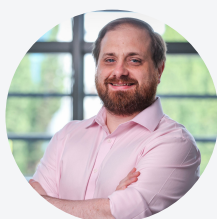
Past leadership positions: Dr Barbara Breznik WG5 Leader & Scientific Communications Coordinator, Dr Rosalinda Sorrentino WG5 co-Leader and Dr Arpad Szoor, Scientific Communications Coordinator.

Target Group Recruitment Committee 1:
pre-clinical researchers



Dr Gianmarco Contino
TGRC1 Leader

Target Group Recruitment Committee 2:
clinically/translational-oriented researchers



Dr Denis Collins
TGRC2 Leader



Ms Catarina Rodrigues
TGRC2 co-Leader

Target Group Recruitment Committee 3:
industry-connected researchers



Dr Hanne Haslene-Hox
TGRC3 Leader



Dr Marta Maleszewska
TGRC3 co-Leader

Grant Holder Institution (Germans Trias i Pujol Research
Institute, IGTP)



Ms Melanie Giorgi
Grant Holder Manager



Dr Marianne Kock Schulmeyer
Coordinator & Senior Project
Manager

COST Association



**Dr Radenka Krsmanovic
Whiffen**
COST Science Officer



Ms Olga Gorczyca
COST Administrative Officer



What Have We Done in
These 4 Years?

Working Groups Overview

Key objectives, general achievements,
and outputs across the Action

WG1

In Vitro and Ex Vivo Cancer Immunotherapy Models

Main Goals

-  To establish basic protocols for immunotherapy response evaluation
-  To identify readout strategies and biomarkers
-  To determine culture durability
-  To expand the number of tumor types in which in vitro and ex vivo Immunotherapy models can be applied

Working Group Overview

WG1 aimed to establish basic protocols for immunotherapy response evaluation, identify readout strategies and biomarkers, determine culture durability, and expand the tumor types covered by in vitro and ex vivo models.

The first year was spent mapping expertise and building collaborations, supported by a shared live document, the members' intranet and a training school in Izmir, Türkiye. From January 2024, meetings were held jointly with WG3, as many members belonged to both. These member-led meetings facilitated introductions and connected members to IMMUNO-model activities.

In the following years WG1 goals matured into tangible outputs — a Springer Methods in Molecular Biology protocol book, the Knowledge Hub open-access protocol repository, and the IMMUNO-model Method CoLab exchange channel — all created to share knowledge across the IMMUNO-model community.

The steepest challenge proved to be the most useful finding. Gathering protocols was harder than expected, because most members had come to IMMUNO-model to learn methodology rather than to share it. The gap that WG1 set out to close is wider than assumed — which is precisely why this community intends to carry its activities beyond the Action through the EFIS Study Group.

Personal Reflection from Working Group Leaders

“ Participating in IMMUNO-model COST Action has been a highly valuable experience. The Action provided excellent opportunities to build new collaborations and exchange knowledge with researchers from different backgrounds. I particularly appreciated the Short Term Scientific Missions (STSM) Grants program, through which we sent one researcher and hosted two visitors, supporting training and international networking.

A key lesson was the value of teamwork and coordinated efforts toward shared goals. Initiatives such as the IMMUNO-model Book of Protocols demonstrated how collective expertise can lead to meaningful outcomes, while regular online meetings helped maintain communication and collaboration.

The experience also highlighted the challenge of sustaining active engagement across a large network, as participation levels varied among members. Overall, the Action confirmed the scientific and personal benefits of international collaboration and community building. ”

–Łukasz Skalniak, Jagiellonian University in Kraków, Poland (WG1 co-Leader)

“ I first joined IMMUNO-model in 2022, firstly by listening in on webinars and meetings. Later I volunteered to build the Knowledge Hub, a protocol-sharing platform, and in 2025 I became Leader of Working Group 1. IMMUNO-model has shown me that being a scientist is not only about experiments in the lab. It is also about learning to work with others, to lead projects and to build a network. Through this community I have grown my communication, organizational skills and project management skills – opportunities that are not easy to come by early in a research career. I learned them alongside experienced colleagues who were generous with their time. Most importantly, I now have a network of people I can turn to – for scientific advice and for guidance on navigating an academic career, which can be especially challenging for young researchers. ”

–Emanuela Senjor, Jožef Stefan Institute, Slovenia (WG1 Leader)



WG2

In Vivo Cancer Immunotherapy Models

Main Goals

-  To define a catalogue of immunotherapy in vivo models and relevant reagents for their application
-  To characterize the most appropriate genetically-engineered mouse models (GEMM) recapitulating human tumorigenesis and/or immunity
-  To consolidate available molecular and biological data on syngenic mouse models in response to immunotherapy
-  To share protocols and strategies to improve humanized mouse models in immuno-oncology
-  To achieve a critical mass of experts focused on the study of immunotherapy-induced toxicity

Working Group Overview

WG2 focused on advancing and harmonizing preclinical models for cancer immunotherapy, while building collaboration across the IMMUNO-model network. During Grant Period 1 (GP1), WG2 organized the online Modelling Immuno-Oncology workshop, covering in vivo, ex vivo and in vitro models and introducing technologies and model species relevant to immuno-oncology. WG2 also initiated collaborations and plans for review articles comparing the advantages and limitations of different technologies and species used as disease models.

During Grant Period 2 (GP2), WG2 consolidated these activities through two meetings and one webinar, with emphasis on strengthening collaborations and developing scientific publications.

Activity expanded substantially during Grant Period 3 (GP3). Following a change in leadership, with Dr Doreen Lau joining the leadership team, WG2 organized the hybrid workshop Harmonizing Models of Immunotherapy: Past, Present and Future Directions in Bergen, Norway. The workshop brought together 53 participants and 14 speakers, presenting in vivo models ranging from zebrafish to porcine

systems and discussing WG2's future priorities. The meeting led to the establishment of five task forces developing review and commentary articles addressing harmonization across immuno-oncology.

Overall, WG2 progressed from network-building and knowledge exchange toward coordinated outputs aimed at improving model standardization, data sharing and translational relevance. Resultant of WG2 activities and network, 2 Norwegian Research Council grants were secured on the development of a bi-specific T-cell engager for Osteosarcoma, with preclinical development via the companion animal model. Furthermore, WG2 participants are involved in a New Frontiers in Research Fund (NFRF) application focused on the development of sarcoma organoids. The consortium was selected from the first round of applications to proceed to the final round of submissions.

Personal Reflection from Working Group Leaders

“Leading WG2 within IMMUNO-model has been a highly rewarding experience, both scientifically and personally. From the outset, our ambition was to bring together researchers working with diverse preclinical models and create a space where expertise, challenges and ideas could be openly exchanged. During the first years, our efforts concentrated on building these connections, identifying shared priorities and exploring opportunities for collaborative publications.

A particular highlight was seeing WG2 evolve from these initial discussions into a more coordinated and productive community. The workshop in Bergen was especially memorable, bringing together 53 participants and 14 speakers working with models ranging from zebrafish to comparative models. Importantly, the workshop did not simply showcase different approaches; it stimulated discussion about where the field needs to go next and resulted in the establishment of five task forces working towards review and commentary articles on harmonization in immuno-oncology.

One of the most important lessons has been the value of bringing together researchers who might not otherwise interact. Different model systems have distinct strengths and limitations, and meaningful progress requires us to understand these differences rather than work within isolated scientific communities. An important part of this approach is ensuring that opportunities to contribute and lead are accessible across the network.

Researchers from Inclusiveness Target Countries (ITCs) and Young Researchers and Innovators (YRIs) are actively supported to participate in workshops, contribute to scientific discussions and take leadership roles, including co-leading collaborative review articles. This not only broadens participation but also brings diverse expertise, perspectives and research environments into the development of community recommendations and outputs.

The greatest impact of IMMUNO-model has therefore been the network itself. It has created opportunities for scientific exchange, new collaborations and shared initiatives across countries and disciplines. Seeing WG2 develop from a forum for discussion into a collaborative group generating tangible scientific outputs has been particularly satisfying. We believe the relationships and shared perspectives established through the Action will continue to influence our research well beyond the lifetime of IMMUNO-model. ”

-Emmet Mc Cormack, University of Bergen, Norway (WG2 Leader)
-Doreen Lau, Brunel University, United Kingdom (WG2 co-Leader)



WG3

Solid Tumors

Main Goals

-  To define the most appropriate models to study immunotherapy efficacy and toxicity in solid tumors, and validate biomarkers to monitor these effects
-  To define protocols for solid tumors sample collection, processing and biobanking
-  To provide sample and data sharing tools

Working Group Overview

WG3 grew into a network of around 250 researchers working on models, samples and data for immunotherapy in solid tumors. We focused on identifying and improving relevant models and biomarkers, sharing approaches for tumor sample collection, processing and biobanking, and facilitating sample and data sharing.

Within WG3, several tumor-specific taskforces brought together researchers with similar interests and challenges. These groups became active platforms for exchanging protocols and expertise, and for developing joint publications and grant proposals.

A highlight was our online matchmaking event in July 2026, which brought together more than 70 participants and led to new contacts and potential collaborations.

The Action also showed that, although many groups face similar challenges, harmonizing models and protocols across different tumor types and research settings remains challenging. The network and collaborations established through IMMUNO-model provide a strong basis to continue this work beyond the Action.

Personal Reflection from Working Group Leaders

“ I really enjoyed being part of WG3, especially bringing people together who were working on similar questions but did not necessarily know each other. For me, the value of the Action has been the contact and collaborations that grew from these connections, and seeing people move from exchanging ideas to working together on publications and grants. ”

-Marleen Ansems, Radboud University Medical Center, Netherlands (WG3 Leader)

“ What I have valued most in IMMUNO-model has been the people. The Action provided a unique opportunity to connect with researchers from different disciplines and countries, creating new collaborations and opportunities that will continue beyond the project itself. Beyond the scientific exchanges, it also fostered lasting professional relationships and, in some cases, genuine friendships. For me, this sense of community is one of the most important outcomes of the Action. ”

-Maurizio Callari Michelangelo Foundation, Italy (WG3 co-Leader)



WG4

Hematologic Tumors

Main Goals

-  To define the most appropriate models to study immunotherapy efficacy and toxicity in hematologic tumors, and validate biomarkers to monitor these effects
-  To define protocols for hematologic tumor sample collection, processing and biobanking
-  To provide sample and data sharing tools

Working Group Overview

WG4 focused on hematologic malignancies, a field that has traditionally spearheaded the development of new cancer therapies and where cellular immunotherapies have their greatest clinical impact. The WG aimed to identify the most suitable experimental models and biomarkers to study immunotherapy efficacy and toxicity, and to contribute protocols and tools for sample handling and biobanking.

One of the most visible scientific outputs was a special issue in *Frontiers in Immunology* on cellular immunotherapy, promoted by WG4 and guest edited by the WG Leader. Among its 14 articles, four reviews by WG4 members covered CAR-T, CAR-NK, CAR-macrophage and tumor infiltrating lymphocyte therapies, emphasizing the strengths and weaknesses of the current experimental models used to assess their preclinical efficacy and safety. WG4 members also authored a review on humanized mouse models in myelodysplastic syndromes, published in *Cell Death & Disease*. Practical skills were built in parallel, with several WG4 participating in STSMs, training in methods such as in vivo hematopoietic transplantation models. Another highly successful activity was the training school on liquid biopsies in hematological malignancies (Coimbra (Portugal), 30 June to 02 July 2025). Interest was so high that not all applications could be accepted. The 21 selected trainees from 11 countries combined theory and hands-on sessions on biomarkers for diagnosis, disease monitoring and treatment response.

A webinar in June 2025 on CAR-T therapy, with talks on mantle cell lymphoma and pediatric cancer, provided additional training with a clinical perspective.

WG4 also served as a platform for research coordination. The meetings held across the grant periods included a face-to-face session co-located with the Insights in Hematology Conference in Cluj-Napoca (Romania), which fostered closer engagement and led to grant applications and scientific collaborations. WG4 members applied to several grants, such as the European Partnership for Personalized Medicine (EP PerMed) and the European Hematology Association (EHA) bilateral grant. The strongest outcome of WG4 cooperation, however, was the award of the Marie Skłodowska-Curie Actions (MSCA) Doctoral Network ACHILLES. It grew directly from WG4 exchanges and will be the most relevant WG4 legacy, giving us the opportunity to continue the mission of IMMUNO-model beyond the end of this COST Action. ACHILLES will train 16 doctoral candidates across Europe in haemato-oncology, with a strong focus on developing new experimental models and analytical tools to improve research outcomes in the field. A webinar on this success story within an IMMUNO-model WG shared this path from WG collaboration to a funded project with the wider Action.

A main challenge was sustaining engagement. Although many researchers joined the WG, most activities relied on a smaller group who proposed and led the training school, webinars, special issue, grant applications and collaborative projects. Their commitment made these achievements possible and shows the importance of nurturing broader participation in future networks.

Personal Reflection from Working Group Leaders

“Taking part in IMMUNO-model since its proposal stage has been a very rewarding opportunity, one that came at a critical moment of my career, just after I had transitioned into an independent PI position. Leading WG4 allowed me to significantly expand my network and strengthen my leadership skills, an experience that is now instrumental in coordinating the ACHILLES MSCA Doctoral Network. The greatest reward, however, has been the many colleagues I have met and learned from, some of whom I can now call friends.

I am especially grateful to everyone in the IMMUNO-model Core Group, an enthusiastic and proactive team strongly committed to making things happen, and to our Chair, Eva, without whose leadership and energy all this would not have been possible. I am confident these links will outlast the Action. ”

-Laura Belver, Josep Carreras Leukemia Research Institute, Spain (WG4 Leader)

“ Serving as co-Leader of WG4 in IMMUNO-model has been a highly rewarding scientific and professional experience. This COST Action created a strong collaborative environment connecting researchers across hematology/oncology, immunology and experimental modelling, while closely aligning with my own interests in immunotherapy and biomarkers. As a clinician, it also provided a particularly valuable opportunity to interact closely with basic and translational researchers, bringing a clinical perspective to discussions on experimental models and biomarkers and helping to bridge clinically relevant questions with laboratory research.

I particularly valued seeing WG4 develop from scientific discussion into concrete initiatives, including training activities, publications, mobility opportunities and collaborative projects. One of the most memorable achievements was the Summer School on liquid biopsies in hematological malignancies in Coimbra, which brought together trainees and experts from different countries and combined scientific discussion with practical training. It was an excellent example of the educational, multidisciplinary and collaborative potential of the COST Action.

From my perspective, the most significant legacy of the IMMUNO-model is the network of collaborations established across areas of interest and countries. These connections have created opportunities for continued scientific exchange and new collaborative projects, many of which are expected to extend well beyond the formal duration of this COST Action. ”

-Rui Bergantim, ULS São João Porto and i3s, Portugal (WG4 co-Leader)



WG5

Communication, Events and Partnering with Industry

Main Goals

-  Coordinating the design and development of the DEPC plan
-  Facilitating the fulfilment of the objectives of the IMMUNO-model COST Action by creating fluent and efficient communication channels among the Action participants and the society

Working Group Overview

During the four Grant Periods, WG5 played a key role in fostering knowledge exchange, strengthening scientific collaboration, and promoting the development of approaches in the field. Through its activities, the WG enhanced interactions among network members and reinforced international cooperation across disciplines and countries. To support these objectives, 11 webinars were organized, featuring leading experts and renowned speakers who shared cutting-edge research, emerging technologies, and best practices across a broad range of topics relevant to the IMMUNO-model community.

Particular attention was devoted to communication, dissemination, and outreach activities aimed at increasing the visibility and impact of IMMUNO-model COST Action and sharing its results with the wider scientific community and stakeholders. These activities included the preparation and dissemination of newsletters, videos, flyers and podcasts, as well as the use of digital and social media platforms such as LinkedIn, YouTube, and Instagram to communicate scientific achievements, events, opportunities, and outcomes of the Action. These communication tools facilitated broader engagement, enhanced the visibility of the network, and supported the dissemination of WG5 activities beyond the immediate community of participants.

Despite challenges related to coordination across institutions and countries, WG5 contributed to achieving the COST Action's objectives providing a valuable platform for strengthening the network and promoting international cooperation.

Personal Reflection from Working Group Leaders

“ Being part of the IMMUNO-model COST Action has been a very enriching experience, both professionally and personally. It provided me with an excellent opportunity to interact with researchers from different backgrounds and countries, expand my knowledge, exchange ideas and expertise, and build new international collaborations. Being part of the open and multidisciplinary IMMUNO-model network has represented an important step in my professional development, strengthening my motivation to pursue international and multidisciplinary research collaborations. ”

-Rosalinda Sorrentino, University of Salerno, Italy (WG5 Leader & Scientific Communications Coordinator)

“ My participation in the IMMUNO-model COST Action has been a highly rewarding experience that enhanced my scientific and professional development. The network connected me with leading experts in tumor models and immunotherapy, fostering valuable scientific collaborations and knowledge exchange. As a young principal investigator and Working Group Leader, I strengthened my leadership and coordination skills while working with colleagues from diverse disciplines and countries. Contributing to the growth of the IMMUNO-model community has been both inspiring and fulfilling, reinforcing the importance of collaboration in advancing cancer research and immunotherapy. ”

-Barbara Breznik, National Institute of Biology, Slovenia (WG5 co-Leader)



Grants

Summary of Awarded Grants

A total of 54 applications were approved over the four years of IMMUNO-model activities, representing a total budget of €101,731 and an average of €1,883 per grant. GP2 was the most productive, with 18 approved applications. During GP3, COST introduced a new type of grant tailored to young researchers wishing to travel abroad and participate in high-level conferences: the Young Researchers and Innovator (YRI) Conference Grant (<40 years old). This scheme also allowed applicants from non-Inclusiveness Target Countries (ITCs) to benefit from financial support to attend conferences.

Regarding young researchers, applicants from ITCs, and gender balance, the distribution was as follows:

- ITC Researchers: 57% of applicants
- Young Researchers: 78% of applicants (84% when excluding Dissemination Conference Grants)
- Gender balance (F:M): 67:33%
- Virtual Mobility (VM) Grants were often planned over several months to allow sufficient time for computational work.

Below are detailed average statistics for each grant type across the four years of the Action (Figure 1), as well as the same statistics broken down by Grant Period (Figure 2).

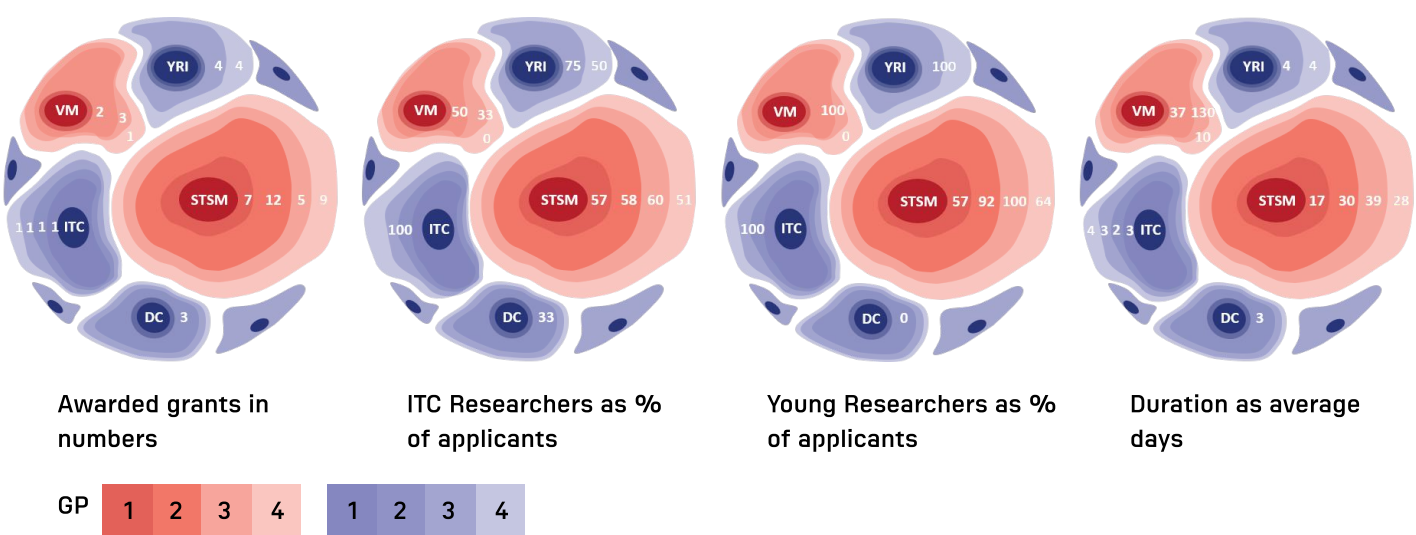


Figure 1. Total number of applications per grant type over the four years, including the percentage of ITC and Young Researcher grantees, and the average project duration.

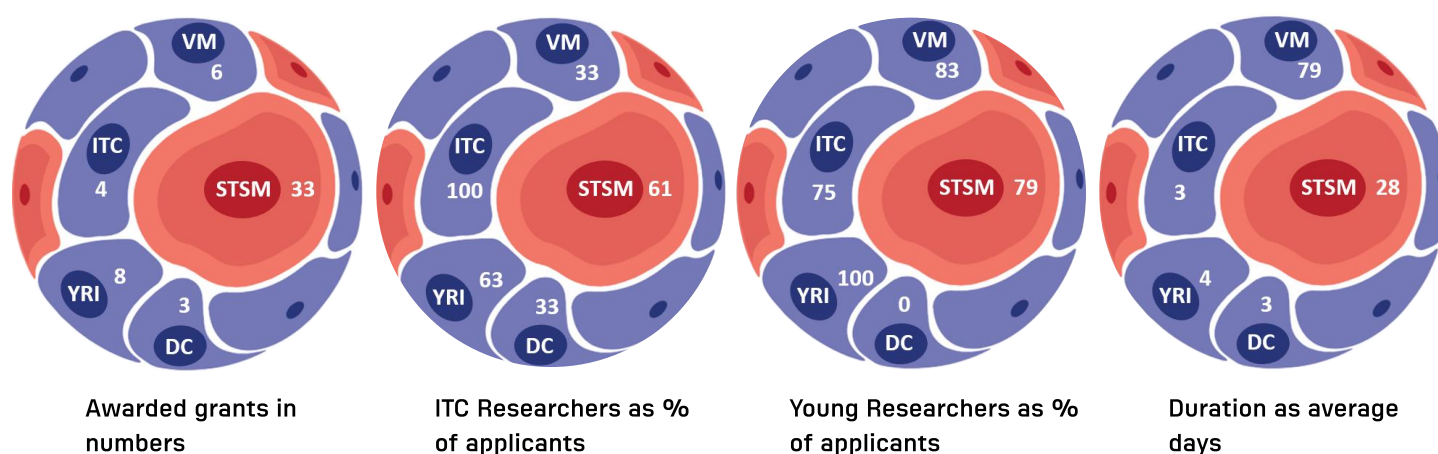


Figure 2. Number of applications per grant type and Grant Period (GP), including the percentage of ITC and young researcher grantees, and the average project duration.

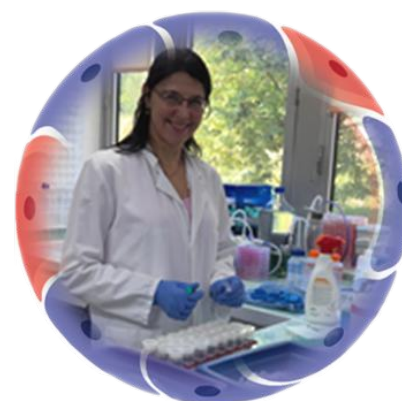
Testimonials from Grantees

A selection of representative grantees was invited to share their reflections on the experience and impact of their grant projects. Below are selected testimonials:

Simona Kranjc Brezar. Institute of Oncology Ljubljana, Slovenia

Senior Researcher: STSM grantee (GP4) from ITC, “High-dimensional immune profiling of changes in immune cell populations in mouse tumors after electrochemotherapy”.

The STSM grant has significantly contributed to my professional development. As a senior researcher (>40 years old) from Slovenia, an ITC, the STSM enabled me to strengthen collaboration with IPBS Toulouse and expand my expertise in tumor immunology through training in spectral flow cytometry, multidimensional immune profiling, and intravital microscopy. The mission fostered valuable two-way knowledge exchange, combining my expertise in electrochemotherapy with advanced immunological approaches and creating new opportunities for joint research, publications, researcher exchange, and future international projects.



Marilina García-Aranda. Malaga Biomedical Research Institute, Spain

Senior Researcher: STSM grantee (GP2) and participant in two Training Schools.

My participation in IMMUNO-model has had a significant impact on my research career.

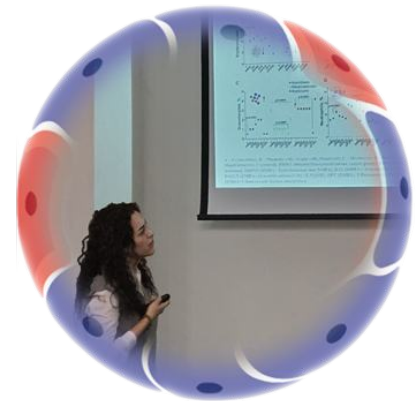


Through two Training Schools, on immunogenomic computational tools and liquid biopsy biomarkers, I expanded my expertise beyond my core background in translational oncology. Most importantly, my STSM at i3S in Porto provided hands-on training in multicellular 3D cancer models and created lasting scientific collaborations. This experience has directly influenced new research lines and led to further joint publications and funding initiatives. I am truly grateful to IMMUNO-model for these opportunities, which have broadened my scientific expertise, expanded my collaborative network, and opened new avenues for international research.

Hayarpi Javrushyan. Yerevan State University, Armenia

Young Researcher: ITC grantee (GP4) attended the Annual Pathology Conference of the “Victor Babeş” Institute, Bucharest, Romania (November 2025).

Receiving an ITC grant from IMMUNO-model enabled me to attend an international conference in Romania, where I presented my research as an oral presentation. This opportunity allowed me to communicate my work to an international scientific audience, gain valuable experience in scientific presentation and discussion, and receive constructive feedback. Beyond the scientific benefits, the meeting provided an excellent opportunity to establish professional connections with researchers from different countries. I particularly appreciated the collegial atmosphere and the exchange of practical knowledge and valuable advice relevant to everyday laboratory work. Overall, the grant strengthened my confidence, expanded my scientific network, and opened opportunities for future collaboration.



Tina Kolenc Milavec. National Institute of Biology, Slovenia

Young Researcher: STSM grantee (GP2) from ITC. “Visualization of the tumor microenvironment in organoids using Imaging Mass Cytometry”



I visited UMC Amsterdam, where I learned the basics of Imaging Mass Cytometry (IMC) from experts in the field. I fell in love with both the technique and the country, which is why I later visited UMC twice more to further develop my expertise in IMC. The IMMUNO-model grant thus contributed immensely to my research: not only did I learn a new technique, which has now become a staple part of my PhD thesis and my everyday work, but I also experienced research life in another country and, more importantly, expanded my scientific network.

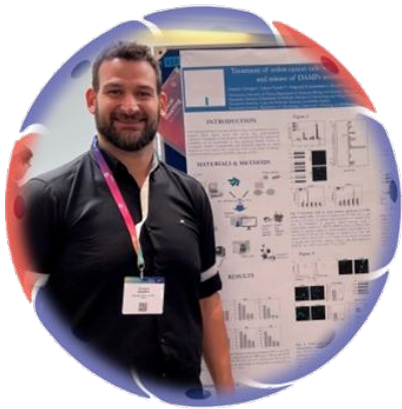
Lucia Juhásiková. Slovak Academy of Sciences, Slovakia

Young Researcher: STSM grantee (GP2) from ITC “Implementation of slice culture technique as a tool for pancreatic ductal adenocarcinoma therapy testing,” and YRI grantee (GP3) “From Cell Lines to Organotypic Slice Cultures: A 3D Platform for Testing Epigenetic and Immune-Based Therapies in Pancreatic Ductal Adenocarcinoma”

The grants have significantly contributed to my professional development. The STSM provided hands-on experience with new laboratory techniques and strengthened my experimental skills. The YRI Grant supported my participation at a scientific conference, enabling me to present my research, exchange ideas, and establish new connections. Together, these opportunities enhanced my research skills, independence, confidence, and international scientific network.



Georges Aindelis. Democritus University of Thrace, Greece
Young Researcher: ITC grantee (GP2).



The ITC Conference Grant from the IMMUNO-model COST Action allowed me to attend the 21st Annual CIMT Meeting in May 2024. My participation in the conference played a pivotal role in my professional career, providing an opportunity to present my research to a highly specialized audience and gain valuable insight in designing my next steps. In addition, it was an indispensable networking opportunity that got me close to other research groups and paved the way for my evolution as a scientist and securing my current position.

Personal Reflection from the Grant Awarding Coordinator

“ Given my previous experience in COST Actions, I was happy to contribute to IMMUNO-model as a Grant Awarding Coordinator (GAC). This role was very interesting, especially from the STSM perspective, as it provides an overview of recent developments within the Action's topics, as well as insight into how other scientists approach specific research questions and which methods they used to address them. This additional knowledge about who is doing what and how they are doing it, will likely have an impact on my own work in the near future.

It was also very inspiring to see the high motivation of young researchers to go abroad and learn advanced techniques from experts, and to observe how these experiences can influence their careers through outcomes such as joint publications. Furthermore, it was interesting to see the very high level of interest in the new YRI grant launched by COST in 2025, a funding scheme specifically designed for young researchers wishing to travel abroad and present their work at high-level conferences. ”

- Philippe Bertrand, University of Poitiers, France (Grant Awarding Coordinator)

Target Group Recruitment Committees

- Target Group Recruitment Committee 1: pre-clinical researchers
- Target Group Recruitment Committee 2: clinically/translational-oriented researchers
- Target Group Recruitment Committee 3: industry-connected researchers

The Target Group Recruitment Committees (TGRCs) were tasked with the responsibility of ensuring the safe and equal contribution of researchers of all genders, across countries, including researchers from small and medium-sized enterprises (SMEs) and clinicians, and with promoting recruitment, inclusiveness, representation, and communication within IMMUNO-model. Throughout the Action, the TGRCs have managed and supervised the recruitment of new members while monitoring and supporting the equal representation and participation of all target groups in Action activities.

The TGRCs have had a particular focus on gender balance, participation of women researchers, the inclusion of Young Research Investigators, and participation of researchers from Inclusive Target Countries with the aim of ensuring equal opportunities across all Action activities and leadership roles.

To achieve this, we began by establishing the IMMUNO-model Inclusion, Diversity and Harassment Statements. Since then, we have contributed to the Scientific Committees of the Annual Conferences, and have annually monitored representation in leadership positions, as well as among speakers and participants. We have also organized targeted events. In 2024 the workshop *"Immunotherapies: charting a course from the lab to the clinic"* in Dublin, Ireland, focused on Clinical translation.

In 2025 *"Young Researchers and Innovators on Immunotherapies"* Workshop in Porto, highlighted Young Research Investigators and their career development in immune-oncology research.

In 2026, we organized a dedicated session on gender and sex in immune-oncology at the Annual Conference in Ljubljana to raise awareness of sex representation in immune-oncology research. We also engaged with SMEs and larger industry stakeholders through dedicated meetings, targeted recruitment materials, and industry networking opportunities, including an SME matchmaking event held during the 2026 Annual Conference.

We are pleased to see that IMMUNO-model has developed into a supportive and inclusive network for researchers from all backgrounds, fostering new collaborations across sectors, countries, and disciplines.

Personal Reflections from TGRC Members

“ Being part of IMMUNO-model and leading TGRC1 has been a great opportunity to bring clinicians, scientists and industry together across Europe.

What mattered most was creating a collaborative and inclusive space where people from different disciplines, countries and career stages could work together, build new connections and involve younger researchers. Supporting younger researchers was an important part of this, and the funding available through the Action allowed us to involve students directly in collaborative projects.

This also led to tangible scientific outputs, including our recent papers on “Preclinical Models for Cancer Immunotherapy: A Systematic Review of Ex Vivo and In Vitro Platforms” and on “Modelling esophageal adenocarcinoma for precision oncology and immunotherapy”. These projects brought together different expertise across the network and helped translate the collaboration into work with direct relevance to future translational research.

For me, the main legacy of IMMUNO-model is the network itself: a community and a set of collaborations that will continue beyond the Action and, I hope, help shape the future of translational immunotherapy research in Europe and beyond. ”

- Gianmarco Contino, University of Birmingham, United Kingdom (TGRC1 Leader)

“ Being a member of the TGRC was a fantastic experience. It gave me the opportunity to reach out to researchers from different backgrounds, career stages, institutions, and countries, while paying attention to balance in terms of age, gender, and geographical representation. In this way, we could contribute to making the COST Action a more inclusive and diverse community.

For me, however, the most valuable part was the collaboration with my young colleagues from the other TGRCs. I am truly grateful for their commitment, ideas, enthusiasm, and energy. Their engagement helped us to organize several impactful events, including the Annual Conference, workshops, and symposia, and to strengthen the sense of community within the Action.

A big thank you to all of them! I hope that the connections and friendships we have built will continue well beyond the COST Action. ”

-Marta Maleszewska-Bobińska, University of Warsaw, Poland (TGRC3 co-Leader)

“ Being part of the TGRC has allowed me to contribute to an important aspect of IMMUNO-model: promoting a more inclusive, diverse and balanced research community. I particularly valued the opportunities created to support initiatives that encouraged broader participation across career stages, countries, and institutions, while also contributing to greater gender balance and representation of researchers from ITCs. The TGRCs provided a space to reflect on how opportunities within the Action could be made more accessible and equitable, from training and mobility to networking and scientific participation. For me, this role highlighted how important it is to actively create conditions in which diverse voices and perspectives are represented and can contribute meaningfully to a collaborative network's success. ”

-Catarina A. Rodrigues, IPO Porto Research Centre, Portugal (TGRC2 co-Leader)

“ The COST Action has left me with renewed scientific insight and opportunities, and has helped shape collaborations and friendships I hope will last throughout my research life. As A TGRC Leader, it was especially impactful to see the voices of our Young Research Investigators, progressing their careers and taking on meaningful leadership roles with growing confidence and authority. ”

-Hanne Haslene-Hox, SINTEF, Norway (TGRC3 Leader)

“ Serving on the TGRCs of the IMMUNO-model COST Action, and leading TGRC2, has been a highly rewarding experience. Through this role, I supported initiatives promoting inclusive recruitment, balanced gender and career-stage representation, and broader participation across the network. IMMUNO-model expanded my knowledge beyond my own research area and exposed me to a wide range of disciplines and perspectives. Most importantly, it enabled me to build lasting friendships and collaborations with colleagues across Europe. I am proud of what we achieved together and look forward to the future collaborations and opportunities that will grow from this network. ”

- Denis Collins, Dublin City University, Ireland (TGRC2 Leader)

Patient Engagement Task Force

Within the IMMUNO-model COST Action, the Patient Engagement Task Force, led by Leticia Oliveira-Ferrer, brings together researchers, patient advocates, and patient associations to strengthen patient involvement in immunotherapy research. Its mission is to build clear communication between science and patients, ensure patient presence at Action events, and foster a lasting partnership between research and patient advocacy.

Since its establishment in November 2024, the Task Force — composed of ten members from research institutions and patient organizations across Europe — has met regularly and reported its activities to the Action's Core Group, Management Committee, and at Annual Meetings.



Key achievements include the creation of a dedicated "Patient Information" section on the IMMUNO-model website, featuring the patient character "Luca" explainer videos on the immune system and immunotherapy, and information on the COST Action and how patients can become involved. The visibility of this section increased substantially, growing from 229 views in 2025 to 834 views by September 2026.

The Task Force also organized a patient-focused Webinar on immunotherapy in cancer, attracted 59 participants and received highly positive feedback. Evaluation of the audience revealed a predominance of scientists rather than patients, prompting a strategic shift towards future local, national-language webinars to better reach patients directly.

Overall, the Task Force has played a key role in strengthening patient engagement within IMMUNO-model COST Action and in promoting more accessible and patient-centered communication around immunotherapy research.

-Leticia Oliveira-Ferrer, University Medical Centre Hamburg-Eppendorf, Germany
(Patient Engagement Task Force Leader & Vice-Chair)

Patient Engagement Task Force Members

- **Leticia Oliveira-Ferrer** - UKE Hamburg, Germany - Researcher
- **Jessica Dal Col** - University of Salerno, Italy - Researcher
- **Jordane Divoux** - Université de Caen Normandie, France - Researcher
- **Theodora Katsila** - Institute of Chemical Biology, Greece - Researcher

- **Silvia Kleinebeckel** - UKE Hamburg, Germany – UCCH - Patient advocate
- **Jürgen Martens**- UKE Hamburg, Germany – UCCH - Patient advocate
- **Lidija Milković**- Ruđer Bošković Institute, Croatia - Researcher
- **Tanja Spanic** - President of Europa Donna, Slovenia - Patient association
- **Ivana Truccolo** - Leader Patient Association Angolo, Italy - Patient association
- **Silke Vogel** - UKE Hamburg, Germany - UCCH - Patient advocate

Knowledge Hub Task Force

The Knowledge Hub Task Force was established to collect, organize and share experimental protocols for immuno-oncology models, so that knowledge could move across the IMMUNO-model community. The task force brought together YRIs—Emanuela Senior (Jožef Stefan Institute, Slovenia), Vinton Cheng (University of Birmingham, UK), Maria Dudau (Victor Babeş National Institute, Romania) and Thanh Hoa Vo (South East Technological University, Ireland) — who met regularly online to build the Hub on the Open Science Framework (osf.io/nc89k).

The Task Force prepared a standard protocol template, presented the initiative to members at the 2nd Annual Conference in Bratislava, and collected, screened and published five protocols — two on glioma organoids, one on mathematical modelling of tumor growth, one computational protocol for identifying transcription-factor-target networks from pre-processed single-cell expression data, and one on modelling invasion and chemotaxis on a chip. The Knowledge Hub also serves as a repository for all materials produced within the Action, so that they remain available once the grant closes.

-Emanuela Senior, Jožef Stefan Institute, Slovenia (Knowledge Hub Task Force Leader and WG1 Leader)

Throughout its four Grant Periods, IMMUNO-model organized a comprehensive program of scientific meetings, workshops, Training Schools and webinars, directly contributing to its Research Coordination (RC) and Capacity Building (CB) Objectives.

The scientific workshops and Annual Conferences promoted collaboration across in vitro, ex vivo and in vivo models, facilitating exchanges on model optimization, harmonization, biomarkers and immunotherapy response. Events addressing 3D models, spatial biology, computational approaches and advanced cellular therapies encouraged methodological exchange and the identification of shared research priorities. Dedicated sessions on clinical translation, industry perspectives and regulatory development strengthened connections between basic researchers, clinicians and industry stakeholders.

Four Annual Conferences strengthened the European immuno-oncology community, while three Training Schools provided specialized training in microphysiological systems, immunogenomic computational tools and liquid biopsies. Eleven webinars broadened access to scientific expertise and emerging technologies. Dedicated events for YRIs, together with activities addressing gender equality and sex differences in immuno-oncology, reinforced the Action's commitment to inclusiveness and career development. These activities also contributed to establishing IMMUNO-model as a visible platform for scientific exchange and international networking.

Overall, the program translated IMMUNO-model's objectives into concrete opportunities for scientific collaboration, knowledge transfer, professional development and sustained networking, laying the foundations for future joint initiatives beyond the Action.

Workshops, Conferences and Training Schools

GP1

Workshop 1 Modelling Immuno Oncology

30/03/2023 | WG 2 | 77 unique participants | Virtual

Key topics: In vivo, in vitro and ex vivo models.

Joint EUSICA + IMMUNO-model Workshop: Fostering collaboration to advance sinonasal cancer research and endoscopic sinus and skull base surgery

03-04/05/2023 | WG 3 | 59 unique participants | Denmark | Hybrid

Key topics: Focused on sinonasal cancers; collaboration between EUSICA consortium and IMMUNO-model.

IMMUNO-model Annual Conference: Exploring the Frontiers of Cancer Immunotherapy: From Models to Breakthroughs

01-02/06/2023 | WG 4 | 189 unique participants | Spain | Hybrid

Key topics: Aimed to spotlight novel experimental models that bridge laboratory discoveries on immunotherapy research with clinical breakthroughs.

WG4 Hematologic Tumors Meeting

08/09/2023 | WG 4 | 18 unique participants | Romania | In person

Key topics: Working Group 4 meeting to network, establish collaboration and plan activities.

Training School on Exploring the Microphysiological Systems

20-22/09/2023 | WG 1 | 19 unique participants | Türkiye | In person

Key topics: Provided an introduction to microphysiological systems.

GP2

Workshop 1 Predictive Biomarkers of Toxicity and Immunotherapy Response in Advanced Melanoma

14-15/03/2024 | WG 2 | 120 unique participants | North Macedonia | Hybrid

Key topics: Latest advancements in personalized melanoma treatments.

Workshop 2 Immunotherapies: charting a course from the lab to the clinic

31/08/2024 | TGRCs | 55 unique participants | Ireland | In person

Key topics: Experts in the pre-clinical, clinical, translational and industry/SME sectors provided presentations outlining their fields of expertise and the current challenges faced in relation to immunotherapies.

IMMUNO-model Annual Conference: From Pre-clinical Models to the Search for Biomarkers in Immuno-Oncology

13-15/05/2024 | ALL WGs | 125 unique participants | Slovakia | Hybrid

Key topics: Showcased innovative experimental models that offer a link between laboratory research and clinical application, as well as an insight into the complex interactions between the immune system, the tumor microenvironment, and immunotherapeutic interventions.

Training school on Immunogenomic computational tools

11-13/06/2024 | WG 3 | 25 unique participants | Spain | In person

Key topics: Focused on key techniques of computational biology to understand tumour and its microenvironment focusing on the immune system.

GP3

Workshop 1 Harmonizing models of immunotherapy: Past, present and future directions

07-08/04/2025 | WG 2 | 53 unique participants | Norway | Hybrid

Key topics: Effectively showcased a broad range of in vivo immunotherapy models enabling participants to reflect on common strengths and limitations such as predictive power, clinical relevance, and translational potential.

Workshop 2 IMMUNO-model YRI Meeting – Young Researchers and Innovators on Immunotherapies: The Future is Now

25/09/2025 | TGRCs | 61 unique participants | Portugal | Hybrid

Key topics: Fostering YRIs careers in immunotherapy and immuno-modeling.

IMMUNO-model Annual Conference: Modeling Immunotherapy for Cancer – Bridging Research to Clinical Application

13/14/05/2025 | ALL WGs | 98 unique participants | Poland | Hybrid

Key topics: Update on immuno-models, applications and limitations.

Training school on Liquid Biopsies in Hematological Malignancies

30/06-02/07/2025 | WG 4 | 26 unique participants | Portugal | In person

Key topics: Applications of liquid biopsies in hematologic cancers.

GP4

Workshop 1 Modelling Immunotherapy in 3D: Bridging the Gap to the Clinic

09/02/2026 | WG 1 | 102 unique participants | Spain | Hybrid

Key topics: Focused on patient-derived organoids, immune-epithelioid, tumors-on-chip, all 3D models/platforms that are intended to innovate preclinical models that bring research closer to clinical application.

Workshop 2 Models, Challenges and Promises of Advanced Therapies for Cancer: NK Cells in the Clinic and Industry

05-06/03/2026 | WG 1 | 112 unique participants | Spain | Hybrid

Key topics: Latest advances in translating NK cell research to the clinic .

IMMUNO-model Final Annual Conference: Building Bridges in Cancer Immunotherapy Modelling

20-22/05/2026 | ALL WGs | 113 unique participants | Slovenia | Hybrid

Key topics: Aimed at presenting achievements of the IMMUNO-model consortium and to create the conditions for the continued development of innovative cancer immunotherapy approaches and future international collaborations.

Symposium on gender equality opportunities and the sex gap in immunology and immunotherapies

20/05/2026 | TGRCS | 93 unique participants | Slovenia | Hybrid

Key topics: Aimed at reviewing how sex and gender differences may influence research and results in immunology and in cancer immunotherapies.

Webinars

GP2

1st Webinar: Emerging Innovations for Immuno-models

14/12/2023 | WG 1 | 65 unique participants | Virtual

Speakers: Krzysztof Wrzesinski & Devrim Pesen Okvur

2nd Webinar: imSAVAR project: Nonclinical mimicking of the immune system effects of immunomodulatory therapies

06/05/2024 | WGs 1&3 | 43 unique participants | Virtual

Speakers: Marek Ostaszewski & Katherina Sewald

3rd Webinar: Mathematical Oncology

25/06/2024 | WGs 3&4 | 20 unique participants | Virtual

Speakers: Christina Kuttler & Peter Hinow

4th Webinar: Dendritic cells and Immunotherapy

02/10/2024 | WG 1 | 47 unique participants | Virtual

Speakers: Riccardo Dolcetti & Massimo Guidoboni & Satwinder Singh

5th Webinar: Preclinical modelling in Immuno-oncology: An industry perspective from Toxicology to IND

15/10/2024 | WG 2 | 32 unique participants | Virtual

Speakers: Michael Boice & Katarzyna Wnuk-Lipinska & Hillary Millar Quinn

GP3

6th Webinar: Spatial Biology in Drug Discovery and Immunotherapy: exploring innovative technologies

19/12/2025 | WG 5 | 65 unique participants | Virtual

Speakers: Kaja Blagotinšek Cokan & Nina Ogrinc

7th Webinar: Computational aspects of spatial biology

14/04/2025 | WGs 1&3 | 43 unique participants | Virtual

Speakers: María Mantas & Heath Patterson & Eduardo Aranda

8th Webinar: CAR-T Cell Therapy: Precision Immunoengineering in Modern Oncology

10/06/2025 | WG 4 | 20 unique participants | Virtual

Speakers: Ciprian Tomuleasa & Jordi Minguillón

9th Webinar: Turning Collaboration into Funding: MSCA Doctoral Network Success from IMMUNO-model to ACHILLES

04/07/2025 | WG 4 | 47 unique participants | Virtual

Speakers: Laia Lagunas & Laura Belder

10th Webinar: Natural Killer Cells in Action: From Bench to Bedside

30/09/2025 | WG 1 | 32 unique participants | Virtual

Speakers: Mar Valés-Gómez & Antonio Pérez Martínez

GP4

11th Webinar: Immunotherapy in Cancer – How It Works and Why Challenges Remain

23/04/2026 | Patient Engagement Taskforce | 48 unique participants | Virtual

Speakers: Uzma Hassan & Gianmarco Contino

Publications and
Manuscripts

Articles published by IMMUNO-model

- Hermsen MA, Lechner M, Oliveira Ferrer L, Trama A, Eriksen PRG, Martinez-Balibrea E, von Buchwald C. *EUSICA/COST IMMUNO-model workshop fostering collaboration to advance sinonasal cancer research: A meeting report*. **Oral Oncology**. 2023;146:106543.
- Morva A, Arroyo AB, Andreeva L, Tapia-Abellán A, Luengo-Gil G. *Unleashing the power of CAR-M therapy in solid tumors: a comprehensive review*. **Frontiers in Immunology**. 2025;16:1615760.
- Tomai R, De Las Rivas J, Fetica B, Bergantim R, Filipic B, Gagic Z, Nikolic K, Gulei D, Kegyes D, Nistor M, Muresan XM, Cenariu D, Feder R, Pavel-Tanasa M, Cianga A, Tigu AB, Munteanu R, Tanase A, Einsele H, Tomuleasa C. *Challenges in the Preclinical Design and Assessment of CAR-T Cells*. **Frontiers in Immunology**. 2025;16:1564998.
- dos Reis FD, Saidani Y, Martín-Rubio P, Sanz-Pamplona R, Stojanovic A, Correia MP. *CAR-NK cells: harnessing the power of natural killers for advanced cancer therapy*. **Frontiers in Immunology**. 2025;16:1603757.
- Kraja FP, Jurisic VB, Hromić-Jahjefendić A, Rossopoulou N, Katsila T, Mirjadic Martinovic K, De Las Rivas J, Diaconu CC, Szöör Á. *Tumor-infiltrating lymphocytes in cancer immunotherapy: from chemotactic recruitment to translational modeling*. **Frontiers in Immunology**. 2025;16:1601773.
- Rani S. (Ed.). *IMMUNO-model in Cancer: Methods and Protocols*. **Methods in Molecular Biology**. Springer Nature, 2026.

Articles published by IMMUNO-model members

- Anwar R, Rose E, Swirsky F, Kunene V, Contino G. *Modelling Oesophageal Adenocarcinoma for Precision Oncology and Immunotherapy*. (2026). <https://doi.org/10.1007/s00262-026-04447-3>
- Colella G, Piccioni V, Swirsky F, Contino G. *Preclinical Models for Cancer Immunotherapy: A Systematic Review of Ex Vivo and In Vitro Platforms*. **Cancer Immunology, Immunotherapy**. 2026.
- Lau D, Elliott T. *Imaging antigen processing and presentation in cancer*. **Immunotherapy Advances**. 2025;5(1):Itaf002.

- Gjerde CH, Kleinmanns K, Langer A, Ruiz de Garibay Ponce G, Rozmus E, Stangeland GN, Leitch C, Elnour R, Dongre HN, Berger C, Gultekin O, Forcados C, Stensland M, Nyman TA, Lehti K, Davidson B, Wälchli S, Gelebart P, Costea DE, Kotopoulis S, Bjørge L, McCormack E. *A 3D ovarian cancer metastasis model using a decellularised peritoneal matrix to study therapy response*. **EBioMedicine**. 2026 Feb;124:106135. doi: 10.1016/j.ebiom.2026.106135. Epub 2026 Feb 2. PMID: 41633102; PMCID: PMC12887378.
- Montico B, Nigro A, Lamberti MJ, Martorelli D, Mastorci K, Ravo M, Giurato G, Steffan A, Dolcetti R, Casolaro V, Dal Col J. *Phospholipid scramblase 1 is involved in immunogenic cell death and contributes to dendritic cell-based vaccine efficiency to elicit antitumor immune response in vitro*. **Cytotherapy**. 2024;26(2):145-156.
- Moratalla-Navarro F, Moreno V, Sanz-Pamplona R. *TALKIEN: crossTALK IntEraction Network. A web-based tool for deciphering molecular communication through ligand-receptor interactions*. **Molecular Omics**. 2023;19(9):688-696.
- Safont MM, Leitch C, Popa M, Gjerstad ME, Caulier B, Inderberg EM, Wälchli S, Gelebart P, McCormack E. *Protocol for the development of a bioluminescent AML-PDX mouse model for the evaluation of CAR T cell therapy*. **STAR Protoc**. 2024 Dec 20;5(4):103522. doi: 10.1016/j.xpro.2024.103522. Epub 2024 Dec 12. PMID: 39673705; PMCID: PMC11699402.
- Shichkin VP, Morva A, Ulaganathan VK, et al. *Breast Cancer Immunotherapy: Mechanisms of Immune Evasion, Biomarkers, and Emerging Therapeutic Strategies*. **Molecular Cancer**. 2026;25:152.
- Tandaric L, Bjørge L, Lode MR, Torkildsen CF, Aehnlich P, Elnour R, Costea DE, Akslen LA, Thomsen LCV, McCormack E, Kleinmanns K. *Establishment of a humanized patient-derived xenograft mouse model of high-grade serous ovarian cancer for preclinical evaluation of combination immunotherapy*. **Mol Oncol**. 2026 Sep;20(9):2203-2219. doi: 10.1002/1878-0261.70231. Epub 2026 Mar 14. PMID: 41830513; PMCID: PMC13398843.

Collaboration Beyond
the Action

EFIS-IL Study Group on Human-Relevant Immuno-Oncology Models (HARMONY)



The EFIS-IL Study Group on Human-Relevant Immuno-Oncology Models (HARMONY) was established as a continuation of the scientific network and collaborative activities developed within IMMUNO-model. The group aims to maintain and expand connections between researchers working on immuno-oncology models, fostering knowledge exchange, joint activities, and future collaborations beyond the lifetime of the COST Action. Importantly, its integration within the EFIS framework provides a valuable opportunity to sustain this network within the broader European immunology community, strengthen interaction with EFIS and its member societies, and increase the visibility and reach of the group's activities. Through dedicated scientific meetings and other collaborative initiatives, HARMONY will support continued exchange across the network while promoting the development, harmonization, and wider adoption of human-relevant immuno-oncology models across Europe.

ioAVATAR: Immune-Oncology Drug Discovery & Decision – Advanced ex vivo Approach to Accelerate Response Prediction for Combined Therapies in Ovarian Cancer



Funding: TRANSCAN-3, ERA-NET: Sustained collaboration of national and regional programs in cancer research, Joint Transnational Call for Proposals 2024 (JTC 2024)

Amount granted: € 956,611

Start – End: November 2025–October 2028

ioAVATAR is a TRANSCAN-3 funded international collaborative project addressing immune response in advanced ovarian cancer (OvCa) through innovative patient derived immunocompetent models. The consortium is coordinated by Prof. Leticia Oliveira-Ferrer (University Medical Centre Hamburg-Eppendorf, Germany) and includes Franziska Brauneck (UKE, Germany), Christophe Caux (Centre Léon Bérard, Lyon, France), Devrim Pesen Okvur (Izmir Institute of Technology, Türkiye), and Rebeca Sanz-Pamplona (Health Research Institute Aragón, Zaragoza, Spain).

A particular strength of ioAVATAR is its connection to the COST Action IMMUNO-model. Leticia Oliveira-Ferrer, Devrim Pesen Okvur, and Rebeca Sanz-Pamplona are members of the Action, providing an established interdisciplinary network for the development and application of advanced human immune-tumor models.

ioAVATAR uses patient-derived ovarian cancer ascites and tumor tissue to establish patient-derived ex vivo models, including ovarian cancer-on-chip systems, and precision tissue culture systems (PCTS), that preserve key features of the tumor microenvironment. These models enable the investigation of tumor-immune interactions and the functional evaluation of combinatory immunotherapeutic strategies targeting pathways including CD47, CD24, CD39, TIGIT, MARCO, and PD-1.

By integrating functional treatment assays with flow cytometry, advanced imaging, and transcriptomic analyses, ioAVATAR aims to identify mechanisms of immune resistance and establish clinically relevant platforms for precision immunotherapy and response prediction in ovarian cancer.

ACHILLES (Advancing in the Challenge of Improving Lymphoma and Leukemia Survival)



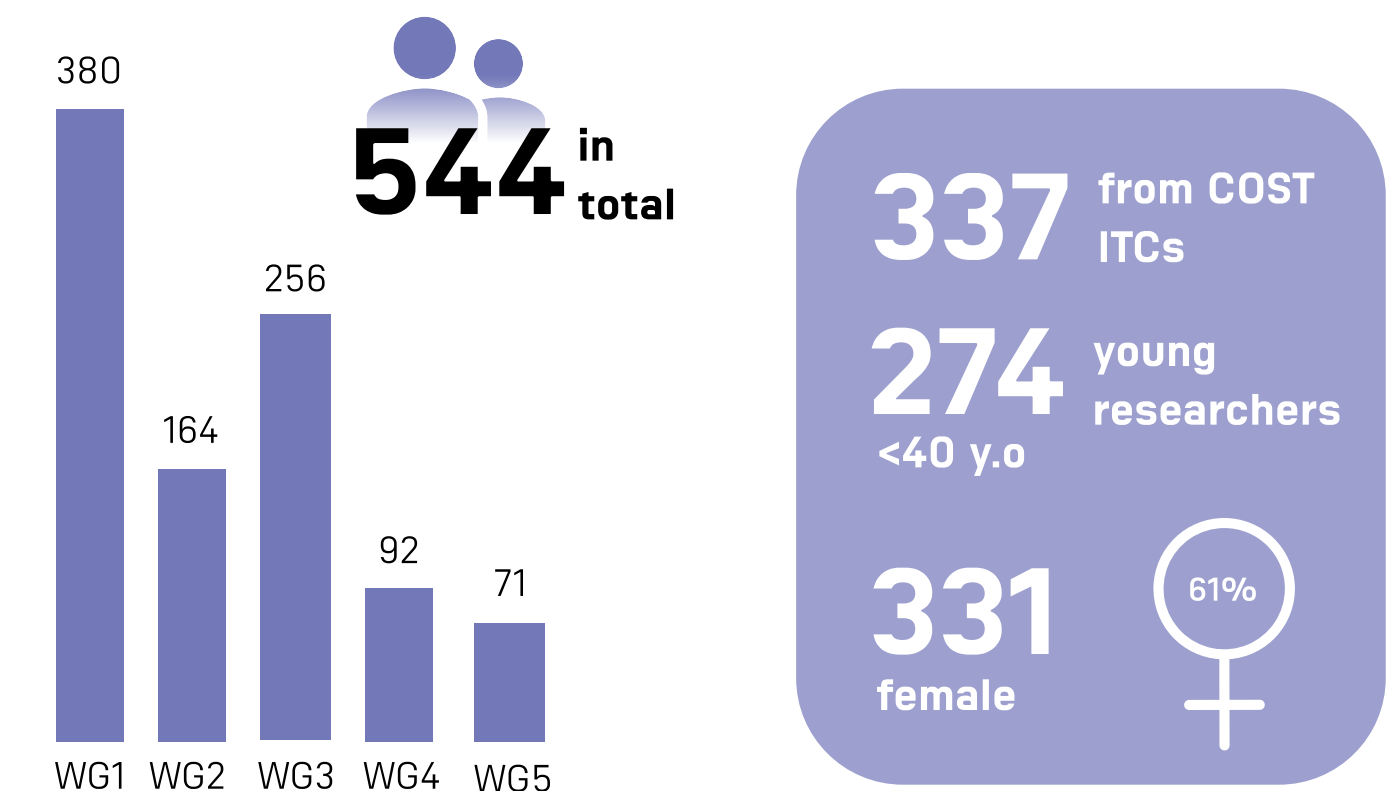
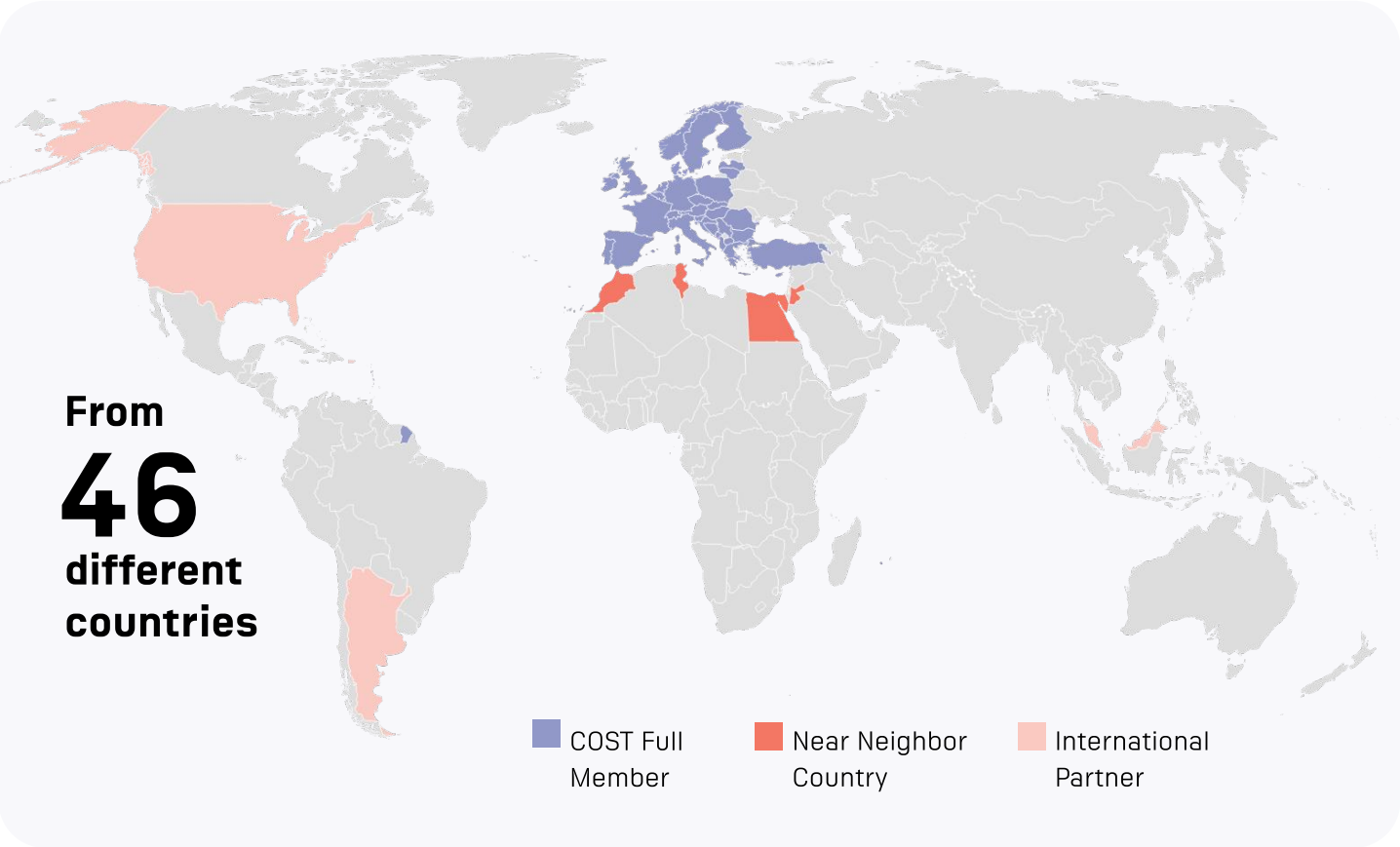
Funding: Marie Skłodowska-Curie Actions (MSCA) Doctoral Networks (DN)
HORIZON-MSCA-2024-DN-01-01
Amount granted: € 4,251,589.20
Start – End: December 2025–November 2029

ACHILLES is a Marie Skłodowska Curie Action (MSCA) Doctoral Network (DN) and is the most lasting legacy of WG4. Running from December 2025 to November 2029, it will train 16 doctoral candidates to become leaders in experimental haemato-oncology. The program addresses a journey from basic discovery to the clinic. It starts with new preclinical models and analytical tools that better reflect the biology of leukemia and lymphoma, continues with the study of the mechanisms behind tumor progression and treatment resistance, and ends with the design and validation of new therapies, including options suited to pediatric patients. Candidates will work across academic and industry settings through international and intersectoral secondments, with the support of leading hematology organizations such as EHA and ESH. In this way, ACHILLES carries the mission of IMMUNO-model beyond the end of the COST Action.



Overall Indicators

Members



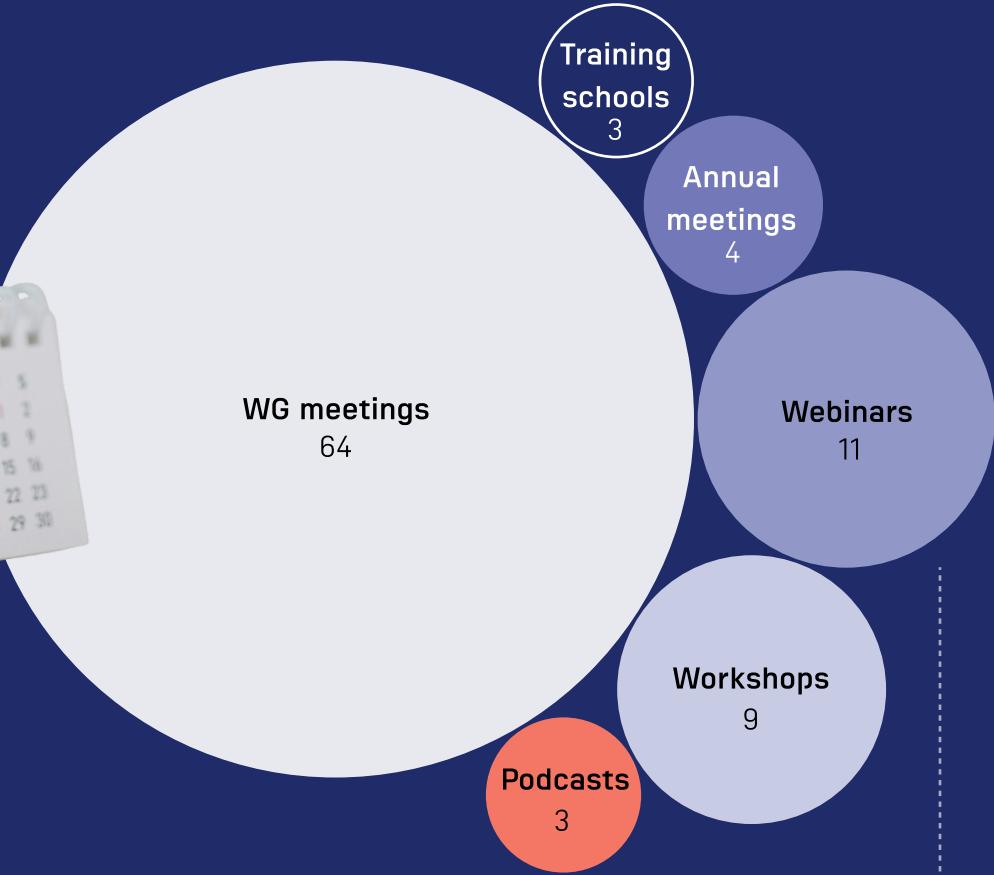
CG: Core Group. GP: Grant Period. ITC: Inclusiveness Target Country. MC: Management Committee. STSM: Short-Term Scientific Mission. WG: Working Group. YRI: Young Researcher and Innovator.

Events

82 events organized



+ 41 CG meetings
+ 8 MC meetings



2450 participants in all activities over 4 GPs

640 attendees at webinars

Social media presence

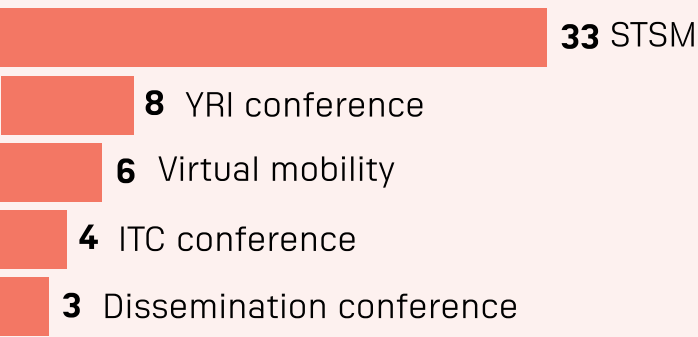
1858 followers 218 followers 162 followers 111 subscribers

Grants



101.731€
invested

Grants awarded by grant type





Testimonials from IMMUNO-model Members

“ As an early-career researcher, IMMUNO-model has had a meaningful impact on my professional trajectory. It has helped me expand my international network, establish new scientific connections, and become more actively involved in the European immuno-oncology community. I am particularly grateful for the opportunity to contribute to the Core Group and to work alongside inspiring colleagues from across Europe. The Action has also opened up new opportunities for scientific collaborations and future joint projects. In addition, the increasing responsibilities I have taken on have supported my progression towards greater scientific independence and encouraged me to pursue new collaborative and leadership opportunities. ”

-Catarina A. Rodrigues, IPO Porto Research Centre, Portugal (TGRC2 co-Leader)

“ Taking part in the IMMUNO-model COST Action has been one of the most rewarding experiences of my scientific journey. The meetings brought outstanding lectures and genuinely inspiring discussions, and they always left me with new ideas and renewed motivation. I especially valued working in the Patient Engagement Task Force, where we created online information for patients and organized a webinar, all to bring science closer to the people it ultimately serves. I am sincerely grateful to all members of the task force, researchers and patients. Their voices and lived experience made our work more meaningful and reminded me why we do research in the first place. Equally memorable was the Breast Cancer Task Force, where I had the pleasure of working with wonderful colleagues on a review paper that is currently under review. The collaboration was warm, generous and productive. IMMUNO-model is more than a network: it is a community that connects people, disciplines and countries, and turns shared curiosity into real collaboration. I am deeply grateful to be part of it. ”

- Lidija Milković, Ruđer Bošković Institute, Croatia (Management Committee Member)

“ Being part of IMMUNO-model has been a great experience! I had the opportunity to be a Work Group Leader and Core Group member, which gave me valuable leadership experience and increased my visibility within the community. Through the network, I met colleagues from across Europe, I expanded my professional network, and I helped organize and participate in a variety of scientific meetings and events. Several of these connections have led to collaborations and joint grant applications. Looking back, IMMUNO-model has played an important role in my professional development and contributed significantly to my promotion from Assistant Professor to Associate Professor. ”

-Marleen Ansems, Radboud University Medical Center, Netherlands (WG3 Leader)

“

I organized the Workshop on Predictive Biomarkers of Toxicity and Immunotherapy Response in Advanced Melanoma, which took place on 14-15 March 2024 in Skopje, North Macedonia. It was an important event for advancing knowledge in melanoma research and treatment. With approximately 120 participants attending both in person and online, the workshop provided a platform for sharing expertise and research among 19 speakers, from the action and external and also professors from the Medical Faculty at St Cyril and Methodius University in Skopje, North Macedonia. The hybrid format of the event facilitated broader participation and exchange of ideas, enabling both local and international experts to contribute to discussions on predictive biomarkers, toxicity management, and immunotherapy response in advanced melanoma. The choice of venue at the main campus of the Medical Faculty further underscored the academic significance of the workshop and its alignment with ongoing research efforts in the field. I believe that such collaborative efforts are crucial for advancing the understanding and treatment of melanoma, ultimately benefiting patients and researchers worldwide.”

- Igor Stojkovski, Ss. Cyril and Methodius University in Skopje, North Macedonia (Management Committee Member)

“

Participating in the IMMUNO-model COST Action has strengthened our research through valuable collaborations, methodological advances, and opportunities for young researchers. One particularly memorable outcome was establishing a collaboration with Dr. József Dudás, who helped us introduce the OTSC methodology through our student Lucia Juhásiková Short-Term Scientific Mission. This collaboration continues, and we are planning to submit a joint research proposal. The methodology will expand our capacity to evaluate immunotherapy efficacy, addressing the limited availability of suitable experimental models. Through collaboration with Dr. Ondrej Vanek, established within the network, we have obtained very promising results in immunotherapy for pancreatic ductal adenocarcinoma. Moreover, our student Ivana Hlavenova is currently undertaking an STSM with Prof. Emmanuel Donnadieu, invited speaker at the conference in Bratislava, to further develop her expertise in OTSC methodology. For me, these experiences demonstrate the value of the IMMUNO-model network: connecting complementary expertise, facilitating knowledge exchange, and transforming scientific discussions into concrete research opportunities. A key lesson has been that sharing methods and supporting researcher mobility can help overcome challenges that individual laboratories cannot easily address alone. The Action has broadened my professional network and strengthened our research capacity, while providing valuable training opportunities for our student and laying the foundations for sustained international collaboration.”

- Bozena Smolkova, Biomedical Research Center, Slovak Academy of Sciences, Slovakia (Management Committee Member)

“ It was my first experience as a member of a COST Action and it was really interesting for me to understand the way this collaborative structure works, especially from the management committee point of view. I also had the chance to join different Working Groups where I discovered new labs and expertise that I was not aware of in Europe. One of the most memorable collaboration I lived was in the “Patient Engagement Task Force” in which I concretely saw the importance of vulgarizing science and make it accessible to society. There, I understand that without patient engagement, research can definitively be devoid of meaning. Overall, this COST Action will have changed my way of viewing and perhaps of making science. ”

-Jordane Divoux, CLCC F. Baclesse, France (Member of the Patient Engagement Task Force and Management Committee)

“ Having served as an MC member and WG1 Leader during the majority of the Action, it has been a privilege to help shape our efforts around in vitro and ex vivo immuno-oncology models. Key highlights of my time leading WG1 include organizing our hands-on school on Microphysiological Systems (MPS), presenting a webinar on advanced preclinical modelling, and publishing an open-access MPS protocol for the broader scientific community. These initiatives embodied the core spirit of IMMUNO-model: demystifying complex bioengineered tools and empowering researchers with open, reproducible methodologies. From my perspective, the true impact of this COST Action is the strong, interdisciplinary network it established. Bridging microfluidics, organoids, -omics and immunology across European centers has laid a durable foundation that will continue to drive translational oncology long after the Action finishes. ”

- Devrim Pesen Okvur, Izmir Institute of Technology, Türkiye (Management Committee Member and former WG1 Leader)

“ Organizing the third Annual Conference of the IMMUNO-model COST Action was a truly enriching experience for me. I am especially grateful to my colleagues from the Scientific and Local Organizing Committees, most of them young investigators, who put so much energy and commitment into creating an inspiring scientific program and making the event a success. It was a real pleasure to welcome so many distinguished speakers, as well as colleagues and friends from across the COST Action, to Warsaw. Bringing together researchers from different backgrounds and career stages created many opportunities for inspiring scientific exchange, new collaborations, and, perhaps most importantly, lasting friendships. I have taken away many valuable scientific and personal connections from this experience, which continue to shape and enrich my everyday scientific journey. ”

-Marta Maleszewska-Bobińska, University of Warsaw, Poland (Management Committee member and TGRC3 co-Leader)

“ The participation of the Cancer Heterogeneity and Immunomics (CHI) participation in the EU COST Action IMMUNO-model has been truly transformative for our group. Through this initiative, we have taken on leading roles in committees and task forces, organized an international Summer School, contributed book chapters and review articles, and supported the completion of predoctoral research fellowships. We have showcased our research at international conferences, receiving awards for outstanding presentations and significantly expanding our scientific visibility and impact across Europe. Importantly, our involvement has enabled us to establish strategic partnerships for European funding opportunities, including the recently funded TRANSCAN-3 project. Beyond the scientific and professional achievements, IMMUNO-model has allowed us to build lasting friendships with talented and genuinely inspiring colleagues across Europe, creating a strong foundation for future collaborations. Overall, this experience has strengthened our international network, enhanced our research capabilities, and opened new opportunities that will continue to benefit our team for years to come. ”

-Rebeca Sanz Pamplona, Institute for Health Research Aragon (IISA) and ARAID researcher, Spain (Management Committee Member)

“ Being part of IMMUNO-model has been a rewarding experience, both professionally and personally. Over the past four years, the Action has brought me closer to colleagues whose enthusiasm, generosity, and commitment have made this network truly special. Beyond scientific exchanges, lasting friendships have emerged, one of its most meaningful legacies for me. Among the highlights of this experience are ACHILLES and the Patient Engagement Task Force. These initiatives reflect the value of bringing together people with complementary perspectives and a shared purpose. They have also reinforced my belief in the importance of collaboration and in ensuring that patients' voices have a place in shaping research. What I will cherish most is the sense of community: the openness to share ideas, the encouragement to develop them together, and the relationships that will continue beyond the Action. I am grateful to have been part of IMMUNO-model and look forward to seeing these connections grow into further collaborations. ”

-Theodora Katsila, National Hellenic Research Foundation, Greece (Member of the Patient Engagement Task Force and Management Committee)

“

Bringing together experts with different perspectives is undoubtedly one of the greatest strengths of such an initiative. At the same time, it requires commitment, openness, and a willingness to develop a common understanding of both the scientific challenges and the viewpoints of fellow participants. In my opinion, this collaborative spirit was a defining characteristic of the Action and one of the key factors driving its success. This aspect deserves particular recognition, as it often distinguishes truly impactful projects from those that achieve more limited outcomes.

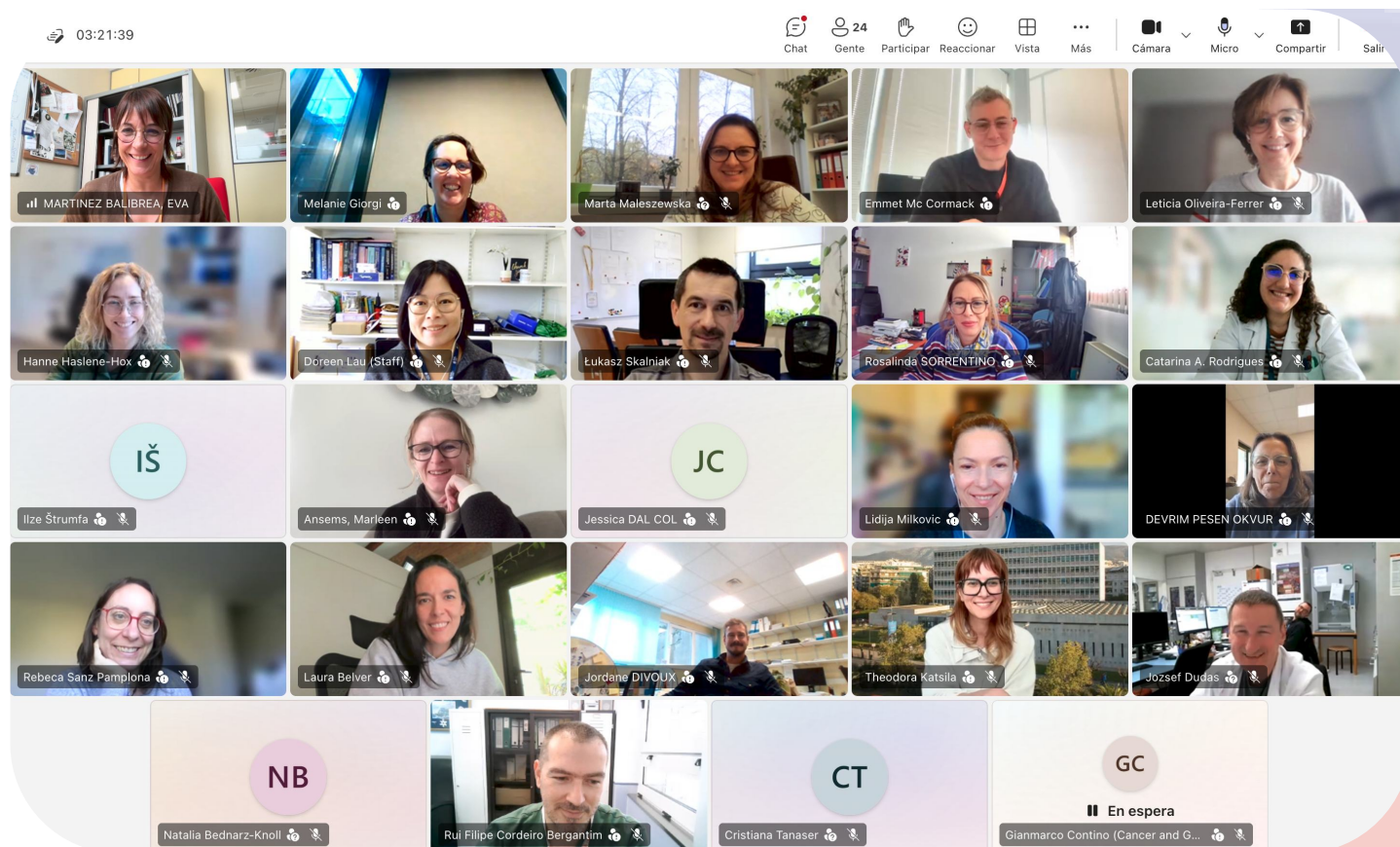
From my perspective, the greatest value of a project such as this COST Action lies in the intercultural exchange it enables, as well as the networking opportunities it creates between research groups and individual scientists. These interactions not only foster scientific collaboration but also strengthen career development opportunities, particularly for early-career researchers. The seminars, workshops, and networking activities organized throughout the Action were highly valuable in facilitating knowledge exchange and building lasting professional relationships. Managing a large and diverse network can, however, present challenges. Maintaining a high level of engagement across a broad community is not always straightforward, particularly during the initial stages of such an ambitious initiative. Nevertheless, through continued collaboration and dialogue, numerous important research questions and novel perspectives were identified and explored within the framework of the Action's objectives.

It is especially encouraging to see young researchers entering the scientific community with enthusiasm and benefitting from participation in a collaborative and supportive international network. In this regard, the COST Action has provided significant added value. Furthermore, it has become clear that all Working Groups (WG1-WG5) play a complementary role and must be advanced in parallel to fully realize the Action's goals. Equally important is the recognition that no single model can adequately capture all immunological aspects of cancer. Progress in the field therefore depends on the integration of multiple complementary approaches, reflecting the complexity of cancer biology and the immune response.”

-Johannes Haybäck, Salzkammergut Clinic, Austria (Former WG2 Leader)

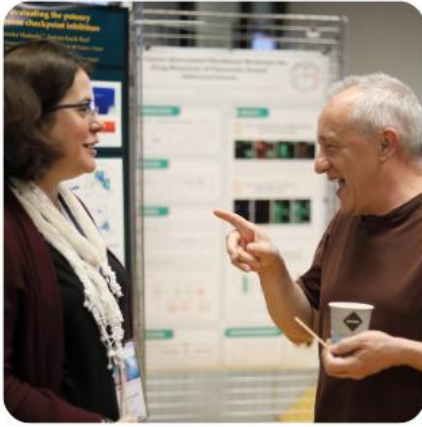
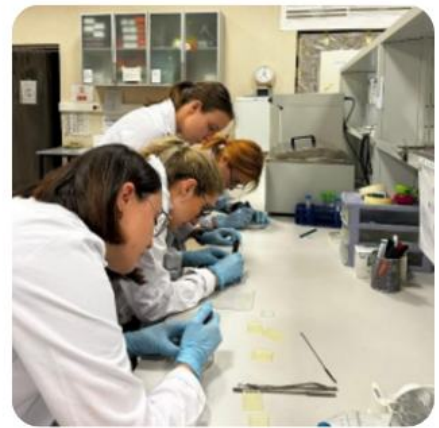
“ As a researcher working in mathematical biology, I joined IMMUNO-model with the idea to find new applications of computational and data-driven mechanistic modelling in the field of preclinical models in oncology. I was a trainer at the Computational Immunogenomics Summer School organized in Zaragoza, Spain, by Dr. Sanz-Pamplona and in my short course I introduced some mathematical approaches for studying mechanistic interactions between cancer and immune cells. Furthermore, during the course of the COST Action I started a collaboration with a medicinal chemist, Dr. Skalniak from Krakow, on an improved model for non-monotone dose responses to novel therapeutic compounds in vitro. Last, but not least, IMMUNO-model gave me the opportunity to apply in a consortium for a Marie Skłodowska Curie Doctoral Network, coordinated by Dr. Belver from Barcelona, Spain. The application was successful, and led me to hire my first international doctoral student funded by this project! My participation in this COST Action helped me start new collaborations with experimental groups across Europe, and made a very positive impact on my professional development as a supervisor of doctoral students. ”

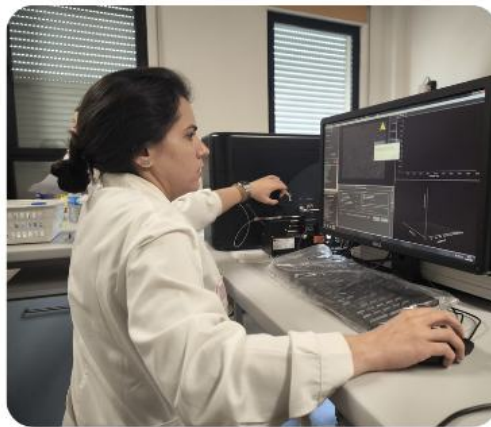
- Peter Rashkov, Bulgarian Academy of Sciences, Bulgaria (Management Committee Member)





Photos from Meetings



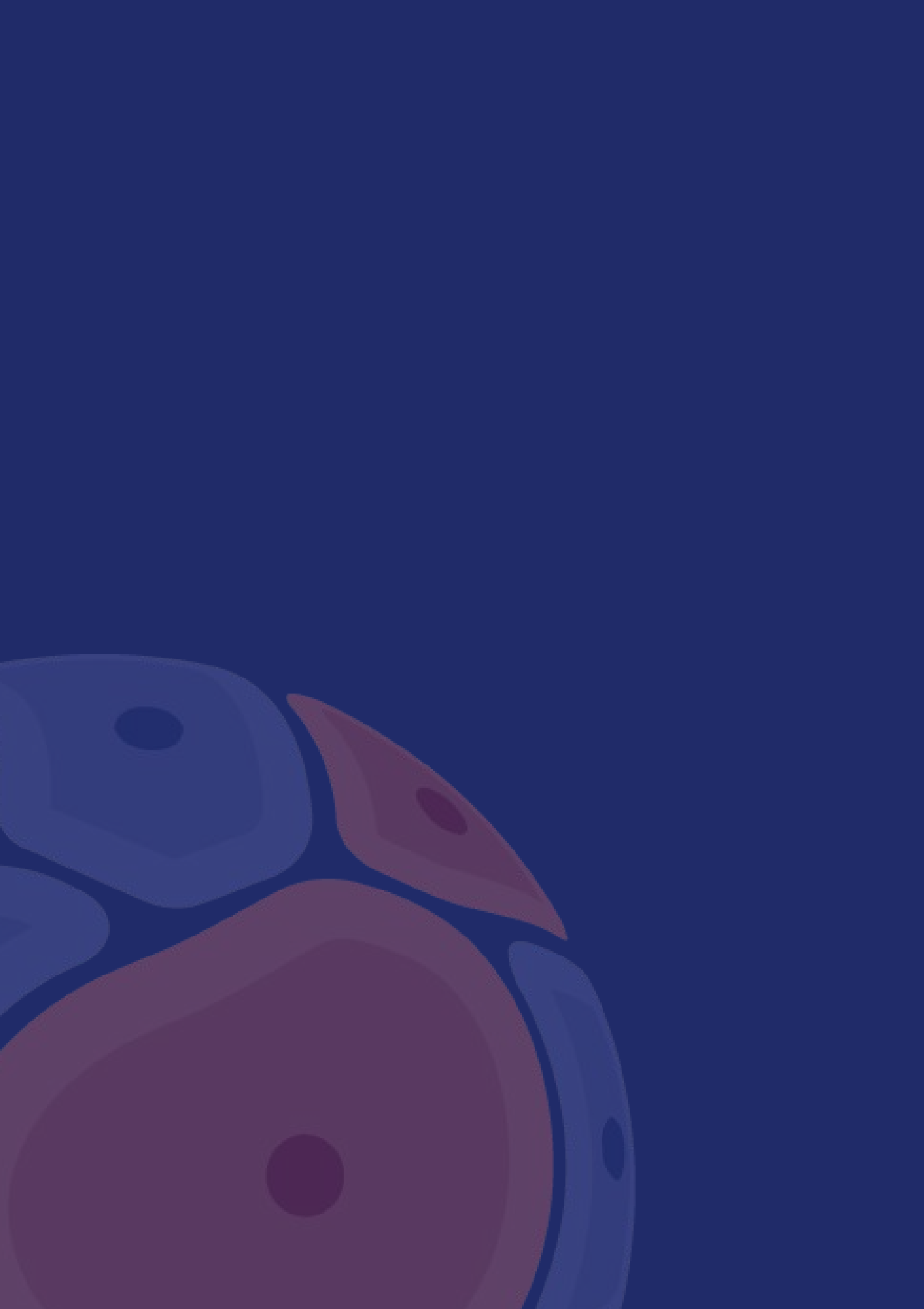








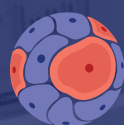






“If you want to go fast, go alone. If you want to go far, go together.”
— Anonymous

Thank you!



IMMUNO-model

IMMUNO-model 2026