Advancing OneHealth*drugs*: Scientific Achievements and Future Perspectives
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Horizontal Group 4 (HG4)– *Young Researcher Innovators (YRIs)* YEAR 3 and YEAR 4 Activities Report

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Horizontal Group 4 (HG4) has a twofold objective:

Training the Next Generation of OHD Scientists
Promoting the One Health approach;
Encouraging interdisciplinary and cross-sectoral collaboration;
Supporting research excellence;
Fostering innovation and long-term research opportunities

Supporting Personal and Professional Development
Expanding international networking opportunities;
Strengthening leadership and communication skills;
Supporting career development;
Promoting mentoring and peer learning

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In line with these objectives, HG4 supports the active participation of Young Researcher Innovators (YRIs) across COST Action CA21111 OneHealthDrugs (OHD). Its activities contribute to the Action's mission of advancing sustainable drug discovery for vector-borne diseases affecting humans and animals, while considering environmental health and promoting collaboration among chemical, biological, medical, veterinary, and environmental scientists.

The first two years of the Action were necessary to let the group to grow, harmonize and rise awarness about their mission. Year 3 and Year 4 were important to develop different activities under the following areas:

- HG4 YRI events and co-organized activities;
- Scientific dissemination;
- Public engagement;
- Stakeholder engagement.

Description of the concepts and activities developed.

Horizontal Group 4 (HG4): Cultivating the Next Generation of One Health Innovators

Within COST Action CA21111 (OneHealthDrugs), Horizontal Group 4 (HG4) serves a vital dual mandate:training the next generation of researchers in the integrated One Health paradigm while providing the structured personal, professional, and leadership development necessary for long-term scientific careers. Spanning chemical, biological, medical, veterinary, and environmental fields, HG4 embeds Young Researcher Innovators (YRIs) at the core of sustainable antiparasitic drug discovery, addressing vector-borne diseases without compromising ecological safety. Across Grant Periods 3 and 4 (Years 3 and 4), HG4 translated these strategic ambitions into a dynamic portfolio of hands-on training, high-level policy advocacy, multilingual communication studies, and public outreach.

Year 3: Technical Immersion, Sustainable Chemistry, and Policy Dialogue

Year 3 established strong technical and interdisciplinary foundations for early-career researchers through specialized events, interactive training, and European stakeholder engagement:

Advanced Scientific Events & Methodological Training:

At the thematic workshop in **Athens, Greece**, HG4 collaborated with WG1, WG2, and HG7 on *"Novel Leads and Drugs for Vector-Borne Diseases,"* bridging chemical synthesis and biological mechanism validation.

In October 2025, the **Seventh OHD Training School**—co-hosted by the University of Modena and Reggio Emilia and the University of Bologna—provided intensive theoretical and bench training on antimicrobial synthetic chemistry and targeted protein degradation (PROTACs).
At the **OHD 2025 Annual Conference in Antwerp**, HG4 led a dedicated YRI session focusing on leadership, transferable skills, and strategic career progression in multinational consortia.
Targeted Digital Upskilling: Virtual masterclasses expanded practical computational and sustainable design skill sets:
A dedicated *Chemoinformatics* session (July 2025) covered compound databases, property forecasting, and virtual screening pipelines.
A *Green Chemistry* workshop (September 2025) embedded Benign-by-Design and waste-reduction frameworks directly into antiparasitic discovery protocols.
Stakeholder Dialogue & Policy Impact: Early-career voices directly influenced European governance during two high-level Brussels meetings:
At the *COST Connect* meeting (June 2025), HG4 leadership and Ambassador Clara Lima championed digital tools and interdisciplinary education to tackle pharmaceutical pollution.
At the *OHD Stakeholder Meeting* (July 2025), YRIs co-presented their perspective on embedding early ecotoxicity assessments and predictive toxicology directly into early-stage lead optimization.
Mobility, Grants, and Societal Outreach: HG4 actively utilized Short-Term Scientific Missions (STSMs) and Conference Grants to facilitate cross-border mobility. Simultaneously, YRIs led major public engagement drives for *World Neglected Tropical Diseases Day* (January 30), *One Health Day* (November 3), *European Researchers' Night*, and *Women in STEM* initiatives, making complex environmental and health concepts accessible to broad civil audiences.
Year 4: Deepening Collaboration, Breaking Language Silos, and Legacy Building
Year 4 shifted toward consolidating scientific outputs, addressing organizational and linguistic boundaries, and securing the sustainable legacy of the Action's early-career community:

Overcoming Consortial and Disciplinary Boundaries:
In February 2026, HG4 tackled the human dimensions of cross-sectoral science with the workshop *"Barriers to Communication and Knowledge Transfer in Large Multilingual Consortia,"* dissecting jargon and institutional silos.

High-level scientific webinars connected discovery disciplines, from parasitological screening assays with Estefania Calvo Alvarez and Michela Cerone (February 2026), to translational *Success Stories*(May 2026), through to bioprospecting *Natural Sources and Organic Waste* for novel chemotypes (May 2026).
Recognition was spotlighted during the *OHD Marathon Days*, where dedicated sessions and competitive awards celebrated standout YRI contributions.
The Brooks Project: Establishing a Shared Semantic Infrastructure:
To resolve conceptual fragmentation across medical, veterinary, and chemical disciplines, HG4 advanced the **Brooks Project**.
Following phased data collection across 2025 and comprehensive survey analysis, the initiative is finalizing a peer-reviewed manuscript and the foundational **OneHealthDrugs Glossary of Scientific Terms**, establishing a unified linguistic standard for future cross-disciplinary drug research. https://www.onehealthdrugs.com/working-area/jobs/ohd5-the-brooks-project-having-a-common-language/
Consortium Legacy and Forward-Looking Events:
YRIs helped draft the *OHD Position Paper* and took center stage at the hybrid *OneHealthDrugs FORWARD LOOK Final Conference* in Brussels (July 2026), ensuring early-career priorities shape future funding mechanisms.
On September 25, 2026, the *European Researchers' Night* at the University of Bologna (Navile Campus) united hybrid research dissemination with science communication, followed by an immersive cultural and networking program exploring Bologna's historic Archiginnasio and Anatomical Theatre.

The postponed multi-working group *Interdisciplinary Workshop on PROTACs* remains queued as an upcoming milestone to further advance targeted degradation methodologies across the network.
Through this integrated cycle of laboratory training, policy interaction, linguistic harmonization, and public advocacy, HG4 succeeded in transforming early-career participants from localized disciplinary specialists into agile, globally competitive One Health ambassadors.

Detailed EVENTS LIST

YEAR 3

- **HG4 YRI Events and Co-organized Activities**

WG1/WG2/HG7 Thematic Workshop – "Novel Leads and Drugs for Vector-Borne Diseases: Targets, Off-Targets, and Mechanisms of Action"
Athens, Greece
HG4 contributed to this interdisciplinary workshop on drug targets, off-target effects, and mechanisms of action relevant to vector-borne diseases, promoting exchanges among medicinal chemists, biologists, and parasitologists.
Seventh OHD Training School – "Synthetic Chemistry of Antimicrobial Drugs and PROTAC Strategy"
1–3 October 2025, University of Modena and Reggio Emilia and University of Bologna, Italy
The Training School provided theoretical and practical insights into antimicrobial drug discovery, synthetic medicinal chemistry, and PROTAC technology, while supporting networking and interdisciplinary collaboration among YRIs.
OHD 2025 Annual Conference – "Strategies for Breaking the Chain Between the Parasite Reservoir in Animals and Infections in Humans"
4–6 June 2025, Antwerp, Belgium
HG4 organized a dedicated YRI session on career development and scientific leadership, providing a forum for discussing professional opportunities, transferable skills, and the role of early-career researchers in international networks.
Interactive YRI Learning Session – Chemoinformatics
24 July 2025, online
The session introduced chemoinformatics tools and their applications in drug discovery, including compound-data analysis, molecular-property assessment, and virtual screening.
Interactive YRI Learning Session – Green Chemistry
25 September 2025, online
The session explored the integration of green chemistry principles into drug discovery, with particular attention to safer chemical design, waste reduction, and environmental sustainability.

- **Scientific Dissemination**

HG4 encouraged and supported YRI participation in the scientific dissemination activities of OneHealthDrugs. Young researchers presented their work, exchanged expertise, and expanded their international networks through:

- Short-Term Scientific Missions (STSMs);
- Conference Grants supporting participation in international scientific meetings;
- OneHealthDrugs scientific conferences, workshops, and Training Schools;
- Oral communications, poster presentations, and YRI-focused sessions;

- **Public engagement**

YRIs contributed to public-engagement and science-communication initiatives designed to increase awareness of One Health, vector-borne diseases, sustainable drug discovery, and the connections among human, animal, and environmental health. Activities included:

One Health Day – 3 November: communication and outreach initiatives highlighting the interdependence of human, animal, and environmental health;
World Neglected Tropical Diseases Day – 30 January activities raising awareness of the global burden of neglected tropical diseases and the need for equitable access to prevention, diagnosis, and treatment;
European Researchers' Night: public-facing activities presenting OHD research through accessible talks, demonstrations, and interactive formats;
Women in STEM initiatives: activities promoting gender equality, scientific role models, inclusive research environments, and the visibility of women in science.

- **Stakeholder Engagement**

COST Connect Meeting – "Advancing a Clean and Healthy Environment through Research Collaboration"
17 June 2025, COST Association, Brussels, Belgium
The HG4 Leader and fellow Ambassador Clara Lima highlighted pharmaceutical pollution and sustainable drug design as key One Health challenges, emphasizing interdisciplinary education, digital tools, and stronger links between research and policy.
OneHealthDrugs Stakeholder Meeting – "Integrating Ecotoxicity into Early-Stage Drug Development"
7 July 2025, COST Association, Brussels, Belgium
HG4 co-presented *"A Young Researcher's Perspective on the Early Integration of Ecotoxicity into Drug Discovery for Vector-Borne Parasitic Diseases,"* advocating for early ecotoxicity assessment, green chemistry, predictive models, and intersectoral collaboration.

YEAR 4

- **HG4 YRI Events and Co-organized Activities**

Workshop – "Barriers to Communication and Knowledge Transfer in Large Multilingual Consortia"
6 February 2026, 15:00–17:00 CET, online
HG4 co-organized this workshop to examine linguistic, disciplinary, cultural, and organizational barriers to collaboration and identify strategies for clearer and more inclusive scientific communication.
YRI Interactive Learning Session – "Parasitology and Biological Evaluation for Drug Screening from a One Health Perspective"
19 February 2026, 17:00–18:00 CET, online
Invited speakers Estefania Calvo Alvarez and Michela Cerone introduced parasitological methods and biological models relevant to antiparasitic drug screening, connecting chemical design with biological evaluation.
HG4 Regular Meeting – "Young Researcher Innovators: Updates and Next Steps"
23 April 2026, online
The meeting reviewed ongoing HG4 activities, shared opportunities for YRIs, and coordinated contributions to the scientific, dissemination, and legacy objectives of the Action.
Workshop – "Success Stories and Challenges in One Health Drug Discovery for Vector-Borne Diseases"
18 May 2026, 10:00–13:00 CET, online
The workshop presented successful examples and continuing scientific, technological, and translational challenges in applying the One Health approach to drug discovery for vector-borne diseases.
Workshop – "Compounds from Natural Sources and Organic Waste for Vector-Borne Diseases"
25 May 2026, 14:00–17:00 CET, online
The workshop explored natural products and organic waste as sustainable sources of bioactive compounds and new chemotypes for drug discovery against vector-borne diseases.
OHD Marathon Days 2025 – YRI Session and Awards
2–5 December 2025
HG4 promoted early-career participation through dedicated YRI sessions, collaborative activities, and awards recognizing the scientific contributions of young researchers.

- **Stakeholder Engagement**

Contribution to the OHD Position Paper
OneHealthDrugs FORWARD LOOK – Final Conference
10 July 2026, hybrid event, COST Association, Brussels, Belgium
HG4 contributed to the final conference by highlighting YRI achievements, professional-development needs, and opportunities to sustain the scientific and collaborative legacy of OneHealthDrugs beyond the Action.

The Brooks Project
Objective: To improve interdisciplinary communication and shared understanding within the OneHealthDrugs network.

- **Initial data collection:** May–June 2025;
- **Additional data collection:** further responses were subsequently collected and incorporated into the dataset;
- **Data analysis:** completed following the inclusion of the newly collected responses;
- **Manuscript preparation:** drafting is ongoing and will be presented
  Expected:
- A manuscript presenting the survey results and examining interdisciplinary terminology and communication within the OneHealthDrugs network;
- A *OneHealthDrugs Glossary of Scientific Terms*.

The project contributes to clearer, more inclusive, and more effective communication across the scientific, linguistic, and cultural communities represented within the COST Action.

"Celebrating Young Researcher Innovators within COST Action CA21111 OneHealthDrugs during the European Researchers' Night: Scientific Dissemination, Science Communication, Public Engagement and Team Building"
25 September 2026, 09:00–22:00, hybrid event, University of Bologna, Navile Campus
The event will celebrate YRI achievements through scientific presentations, science-communication and public-engagement activities, connecting participants and parallel initiatives across the OneHealthDrugs network.
Optional Team-Building and Cultural Programme
26 September 2026, 09:00–12:30, Bologna city centre
The optional programme will include networking and a guided tour in English of the Palazzo dell'Archiginnasio and Anatomical Theatre, linking Bologna's academic heritage with the development of biomedical sciences.
Interdisciplinary Workshop on PROTACs
Initially planned for 25 September 2026, 14:00–17:00; to be postponed
Co-organized by WG1, WG2, WG3, WG4, HG4, and HG7, the workshop will explore PROTACs and targeted protein degradation as innovative strategies relevant to drug discovery. A new date will be communicated.