Project Number: 952914

Project Acronym: FindingPheno

Project Title: Unified computational solutions to disentangle biological interactions in multi-omics data

D1.4 Report on dissemination, training and networking activities in FindingPheno

WP1 TRAINING, DISSEMINATION, AND OUTREACH

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DOCUMENT HISTORY

Version	Date	Description	Changes
0.1	29/04/2022	First draft	
0.2	31/05/2022	Second draft	A section added about project videos
0.3	31/08/2022	Third draft	Report updated with additional training information
1.0	18/10/2022	Submitted	Report updated and submitted

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1 Executive summary

The purpose of this Report is to describe and summarise the dissemination, training and networking activities conducted in FindingPheno during the first reporting period (M1-M18) and their impact. We build on the strategic planning outlined in the Plan for Dissemination and Exploitation of Results (PDER, D1.1), along with activities reported in D1.2, D1.3 and D8.1.

FindingPheno's major objective is to develop better computational solutions for the challenges posed by the vast amount of multi-omics data that is currently being produced. We aim to make these solutions widely known and applicable across the biotechnology industry with specific focus on the role of the microbiome in biological processes. To fulfil this aim we have developed a diverse portfolio of dissemination materials and communication channels and have conducted a range of activities including stakeholder events, training courses, networking meetings, and public outreach. In addition, we have begun to develop a solid network within our target audiences, including several new connections or collaborations. Learnings from these experiences have been incorporated into the updated PDER laying the groundwork for efficient dissemination and wide exploitation of future project results.

2 Introduction

This document has been prepared in the frame of Tasks 1.1-1.4 in Work Package (WP) 1 – *Training, dissemination, and outreach*. It has been produced at the end of the first reporting period (M1-M18) for FindingPheno and is the first in a series of three deliverables reporting on the status of communication and dissemination activities. The planned dissemination, training and networking activities have been described in great detail in the PDER, submitted in M6 and updated annually, including a comprehensive strategy for all areas and practical plans for implementation. In addition, the first communication activities have already been described in D1.2 (Visual Identity and Project Website), D1.3 (Stakeholder Synergy Meeting) and D8.1 (Plenary Kick-Off Meeting). Therefore, this document has been designed as a concise reporting document, providing an overview of what has been achieved in year one, metrics and impacts, any new insights and an outlook for the next period's activities.

3 Dissemination and Communication Plan

3.1 Dissemination and Exploitation Strategy

3.1.1 Strategy Overview

FindingPheno's major objective is to develop better computational solutions for the challenges posed by the vast amount of multi-omics data that is currently being produced. Our main communication aim is for these solutions to become widely known and applicable across the biotechnology industry, with specific focus on the role of the microbiome in biological processes.

3.1.2 Target Audiences

Relevant audience groups were identified and mapped according to their interest and influence within the project to identify the major communication needs of each group. This was then updated in light of the first year's activities, as shown in Figure 1. A stakeholder risk and involvement analysis was then conducted with the updated groups to identify key messaging objectives for each group - see D1.1, Table1 for more details.

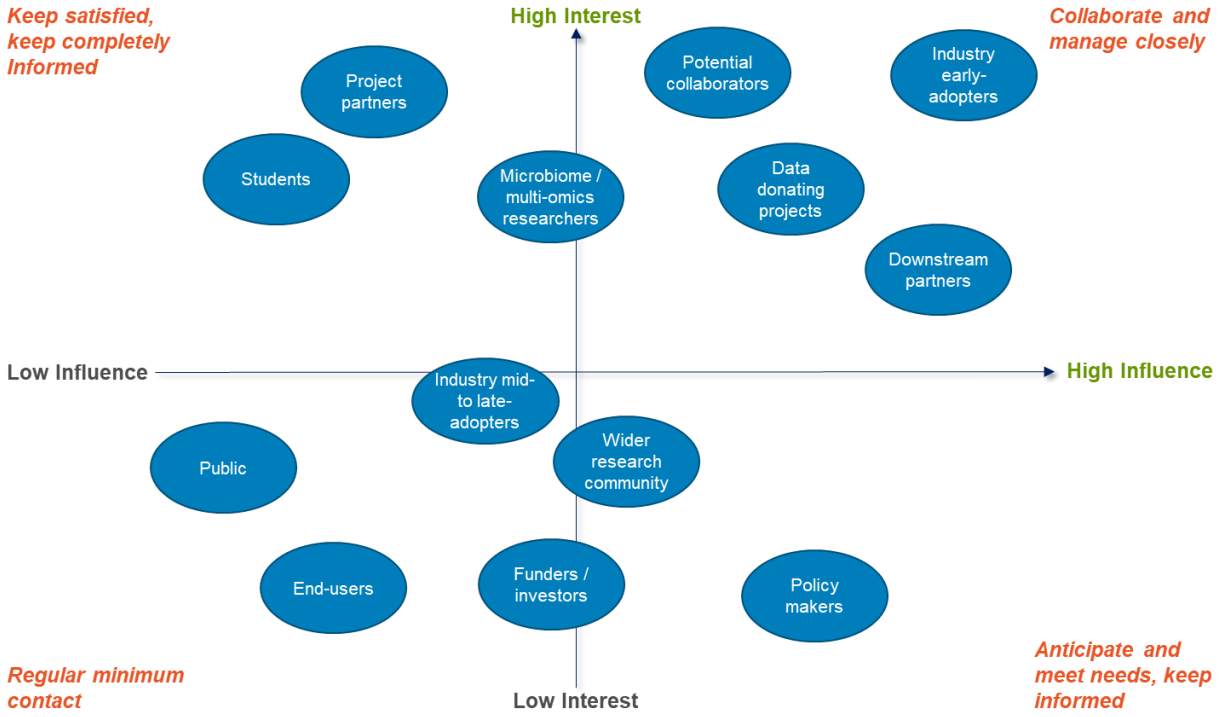

Figure 1: Stakeholder mapping.

A summary of stakeholders and KOLs contacted from each target audiences, the key messaging objectives fulfilled during this period and any audience feedback or new insights gained is given in Table 1 below.

Table 1: Stakeholders contacted, messaging strategy and feedback

Audience	Main Interactions	Messaging Objectives Fulfilled	Feedback / Insights
Upstream partners / data donating projects	HoloFood, HappyFish, HoloFish, CrappyFish, FARM-CARE, LowRRA	Maintain and expand access to high quality data inputs. Find project synergies to increase reach and develop future collaborations. Mobilise KOLs and multipliers with capacity to influence other potential collaborators.	Gaining access to unpublished data sets has proven a lot more difficult than expected, even from existing collaborators.
Downstream partners / potential distributors	EMBL-EBI, Qiagen, BaseClear, ELIXIR, Novozymes One Health	Strengthen resilience and redundancy of supply. Align with FindingPheno's mission statement and culture. Spark interest and build relationships ready for future exploitation of results.	Start to think about potential beta testers beyond the partners, ready to activate once we get to that stage.
Industry early adopters	**Feed producers:** Cargill **Probiotic companies:** Biomcare, Lactobio, Bactolife **Enzyme companies:** Chr Hansen, Njorth Bio **Metabolic modelling:** UnseenBio, BaseClear	Adapt to different end-user needs. Gain visibility. Increase market pull. Mobilise KOLs and multipliers with capacity to influence other potential end-users.	Industry sees academic researchers as useful sources of new knowledge and ideas. Industry has an interest in purchasing large data sets generated by academic researchers.
Industry mid-to late-adopters	**Human health:** Novozymes One Health, UnseenBio	Lay groundwork for future adaptation of our tools to different end-user needs. Gain visibility. Increase market pull.	Little to no interest from fermentation companies or researchers. While some human health were interested, it was agreed

	Industrial fermentation: BioSyntia, Bacthera		that we are too early for them to fully engage.
Potential collaborators, esp. other H2020 projects	HoloFood, 3D-omics, CIRCLES, SIMBA, MASTER, GLOMICAVE, ROOTPHENOBIOME, EcoStack, Excalibur, Avant, FARM-CARE, PoshBee, ELIXIR, Bac4Crop, E-MUSE, DyNaMo, PROMICON, MicrobiomeSupport	Find project synergies to increase reach and develop future collaborations. Strengthen partnerships. Prepare funding applications to build on FindingPheno. Academic and career development of FindingPheno early career researchers (ECRs). Gain visibility. Increase understanding of the hologenomic framework.	There is a strong willingness for engagement from many other publicly funded projects and focusing on this stakeholder group this is a good way to develop new collaborations or partnerships.
Microbiome or multi-omics researchers	Researchers interested in microbiome and/or multi-omics analysis.	Find project synergies to increase reach and develop future collaborations. Gain visibility. Academic and career development of FindingPheno ECRs. Increase understanding of the hologenomic framework.	Researchers are still generally only interested in engaging with us if they fall within our designated research areas.
Wider research community	Academic and industry researchers in general.	Gain visibility. Educate about the importance of the microbiome to all life and increase understanding of the hologenomic framework.	Researchers are still generally only interested in engaging with us if they fall within our designated research areas.
Public	The public.	Gain visibility. Raise awareness of problems caused by climate change and food security. Educate about the importance of the microbiome to all life and increase understanding of the hologenomic framework.	Most communication has been one-directional (i.e. broadcast outwards) making impacts difficult to measure.
Funding bodies / third party investors / policy makers	Horizon 2020, Horizon Europe, National funders	Raise project visibility. Fulfil reporting requirements. Increase chances of future funding or financial investments to expand on and fully exploit the current research project.	Most communication has been one-directional (i.e. broadcast outwards) making impacts difficult to measure
Project partners	All project partners: UCPH, CER, UTU, EMBL, Qiagen, Njorth Bio, FChampalimaud, Chr. Hansen	Maintain interest and alignment with project goals. Strengthen relationships. Build visibility for individual partners outside of the project. Academic and career development. Increase chances of future funding or financial investments.	While some internal communication is facilitated via the Project Manager, all researchers also talk directly to each other removing any potential gatekeeper bottlenecks.

3.1.3 Summary of Dissemination and Communication Channels

The following dissemination and communication channels have been developed in the first reporting period.

Table 2: Dissemination and communication channels

Channel	Target audiences	Details
Digital Channels		
Website	Data donators, distributors, potential collaborators, academic community, students, practitioners, funders, policy makers, public	Static material explaining the project, updates about events or new resources as required

Twitter	Data donators, distributors, potential collaborators, academic community, students, public	Short written updates, videos, images, retweets of relevant content
LinkedIn	Data donators, distributors, potential collaborators, industry early adopters, industry mid/late adopters, microbiome projects, students, public	Short written updates, videos, images, reshares of relevant content
Blog	Data donators, distributors, potential collaborators, academic community, students, practitioners, public	Monthly blog posts about topics of relevance
Email newsletters	Potential collaborators, academic community, students, practitioners, public, project partners	Mailchimp newsletter to external subscribers, monthly internal email newsletter to all project participants
Videos	Potential collaborators, industry early adopters, microbiome projects, academic community, students, public	Short videos uploaded to youtube for wider distribution
Events and Networking		
Stakeholder Synergy Meeting	Data donators, distributors, potential collaborators, industry early adopters, microbiome projects, academic community	One day, in person scientific symposium
Public webinar	Potential collaborators, industry early adopters, microbiome projects, students, academic community, policy makers, public	Online scientific webinar
Project meetings	Project partners, funders	Internal meetings, in person or online
Direct contact	Potential collaborators, industry early adopters, industry mid/late adopters, microbiome projects	Email conversation, online meetings or in person meetings with specific stakeholders
Scientific Publications		
Conference presentations	Data donators, potential collaborators, microbiome projects, students, academic community, policy makers	Peer viewed conference posters or oral presentations
Journal publications	Distributors, potential collaborators, microbiome projects, students, academic community	Peer reviewed journal articles or reviews
Training		
Internal webinars	Project partners, data donators	Online training for project partners
Lectures, workshops	Data donators, potential collaborators, microbiome projects, students	Online training material for project partners made widely available. Participating in an upcoming course offered by another EU project HoloFood in Bilbao in September 2022.
Online training materials	Microbiome projects, students, academic community, public	Training materials hosted on the FindingPheno website

3.1.4 Action plan & timing

The Global Action Plan includes the main events and actions to be carried out during the FindingPheno project execution, with focus on communication, dissemination, knowledge sharing and exploitation. The first version of the Action Plan was developed for the draft PDER and is provided in Table 3 on the next page. The status and evaluation of these activities is then reported and discussed in Sections 4 and 5.

Table 3: FindingPheno Global Action Plan with event descriptions.

	Proposed Action	Yr 1 2021 Mar 1	Apr 2	May 3	Jun 4	Jul 5	Aug 6	Sept 7	Oct 8	Nov 9	Dec 10	2022 Year 2 Jan 11	Feb 12	Mar 13	Apr 14	May 15	Jun 16	Jul 17	Aug 18	Sept 19	Oct 20	Nov 21	Dec 22	2023 Year 3 Jan 23	Feb 24	Mar 25	Apr 26	May 27	Jun 28	Jul 29	Aug 30	Sept 31	Oct 32	Nov 33	Dec 34	2024 Jan 35	Feb 36	Mar 37	Year 4 Apr 38	May 39	Jun 40	Jul 41	Aug 42	Sept 43	Oct 44	Nov 45	Dec 46	2025 Jan 47	Feb 48
Website	Static content			Launch		Update partner pages							Add resources			Update partner pages																																
	Dynamic content			Launch		Continuous updating																																											
	Blog posts				Post 1x/month							ML blog posts																																							
Social Media	Twitter		Tweet 1x/week																																														
	LinkedIn		Post 1x/month																																														
Comm. Material	Videos									1x intro, 1x children				Release and boost																														1x industry					
	Public newsletter					Released with blog posts, 1x/month																																												
	Brochures, posters, etc	Prepare as needed																																														
	Press releases / interviews	Proj Launch																																													
	Peer reviewed articles												D3.1					D4.1							D3.2			D5.2			D3.3										D5.3							
	Databases / open source software																																															
Events	Facilitate / lead external events								StSyn D1.3															MidSymp																		FinSymp		D2.4 +CLC D7.3				
	Internal events		KOM D8.1						GA			ML train				STC	CWL train		MM train		STC							STC								STC										STC	
	Participate in external events																																															
	Conference presentations																				HoloFood Conf																												
Other	Reports for EU			D1.1 PDE			DMP D2.1									STC D8.2			DTE D1.4	P1					STC D8.3											STC D8.4 +DTE D1.5		P2										STC D8.5 +DTE 1.6	

Abbrev.	Deliv.	Type	Respons.	Description
KOM	D8.1	Internal Event	UCPH	Kick Off Meeting minutes
GA		Internal Event	UCPH	General Assembly
StSyn	D1.3	External Event	UCPH	Stakeholder Synergy Meeting
DMP	D2.1	Report	EBI	Data Management Plan
ML train		Internal Event	UTU	Training: machine learning and statistical models for multi-omics data
STC1	D8.2	Report	UCPH	Steering Committee Meeting minutes
		Video	UCPH	Video aimed at school children
CWL train		Internal Event	EBI	Training: Common Workflow Language
DTE1	D1.4	Report	UCPH	Dissemination, training and exploitation report
MM train		Internal Event	CER	Training: mechanistic models of microbiomes

P1	P1	Report	UCPH	First period reporting
Abbrev.	**Deliv.**	**Type**	**Respons.**	**Description**
MidSyn		External Event	UTU	Midway Stakeholder Symposium
STC2	D8.3	Report	UCPH	Steering Committee Meeting minutes
STC3	D8.4	Report	UCPH	Steering Committee Meeting minutes
DTE2	D1.5	Report	UCPH	Dissemination, training and exploitation report
P2	P2	Report	UCPH	Second period reporting
STC4	D8.5	Report	UCPH	Steering Committee Meeting minutes
		Video	UCPH	Video about FindingPheno aimed at industry
CLC	D7.3	External Event	Qia+Nbio	CLC workbench end-user training
EmC	D2.4	External Event	EBI	Embassy Cloud public webinar

DTE3	D1.6	Report	UCPH	Dissemination, training and exploitation report
FinSymp		External Event	UCPH	Final Symposium

3.2 Learnings and Updates

3.2.1 Changes to stakeholder assessments

Engaging with the different stakeholder groups has given some new insights into their interest in our research program and stakeholder groups have been realigned in light of this information. There have been two main changes, which are incorporated into the messaging strategy for the next reporting period:

- Engaging with other data scientists or microbiome projects has shown a strong unmet need for the kinds of multi-omics analysis tools we are producing in FindingPheno which has already resulted in some new collaborations. Meanwhile, engaging with the wider academic community shows that researchers outside our sphere of microbiome / big data omics / sustainable farming have low interest in what we are doing. Therefore, these two groups have been realigned into "potential collaborators" and "wider academic community" to reflect these different levels of interest, with more resources being put into the former group and reduced resources put into messaging for the latter.
- Our interactions with different research industries has shown that some of our assumptions about who is likely to be early vs mid/late adopters of our results do not hold true, with industrial fermentation less interested than expected but both probiotics and human health more interested than expected. We will adapt our future messaging and engagement strategies to account for this new information.

3.2.2 Updates and Additions to the PDER

The PDER first draft was submitted in April 2021 (M2), followed by an updated PDER presented at the year two STC meeting in May 2022. The main updates to the PDER were as follows:

- The stakeholder messaging strategy was updated to incorporate the refined stakeholder analysis as described in Section 3.2.1 above and specific researchers, projects or companies were identified for the updated audience groups.
- The action plan for year one was updated to better reflect the actual activities undertaken, and a fine grained implementation plan was developed for year two.
- The usefulness and relevance of all chosen KPIs was assessed in light of our experiences and feedback to our outreach activities, and small adjustments were made (Table 8).

4 Status of Actions

4.1 Focus in Reporting Period 1

As no results are available at the beginning of the project, during the first period the strategy focussed on raising awareness of the project among the different stakeholders to create a wide audience base for future disseminative activities. Then, as results and deliverables become available for exploitation in later periods, these activities will include more developed and technical content. Training events have been mainly internal with the aims of sharing knowledge and increasing skill levels within the project during our first research phases. Meanwhile, networking has been given a high priority during this period to both identify and connect with relevant stakeholders in our target audiences, maintaining or strengthening existing relationships, building new collaborations, and raising awareness of our project's potential.

4.2 Logo and visual identity

To give the project a uniform visual identity, a FindingPheno logo was designed for use on communication materials such as the website, presentations, posters, documents, etc. This logo was commissioned via a 99designs.com design competition and incorporates themes of chaos vs order and network interconnectedness. The logo was then extended to a full brand identity for FindingPheno which includes project colours and font scheme (Figure 2).

FindingPheno

	Hex	RGB
*	#ea5526	234,85,38
	#ee7752	238,119,82
	#8ae1e3	138,225,227
*	#15c6c8	21,198,200
	#53a6d0	83,166,208
*	#00517a	0,81,122
*	#72a500	114,165,0
	#c0609c	192,96,156
	#fdbb43	253,187,67
	#262626	38,38,38
	#4d4d4d	77,77,77

Level	Font	Colour	Largest	Middle	Smallest
H1	**Poppins Semi Bold**	Black	56	56	40
H2	Arial	Black	30	30	26
H3	Arial	Black	26	26	22
H4	Arial	Black	22	22	
H5	Arial	Green	16	16	16
P1	Tahoma	Black	22	22	19
P2	Tahoma	Black	19	19	18
Buttons	**Poppins Semi Bold**	Black / White	16	16	16

Figure 2: FindingPheno logo, brand colours and font scheme. * = main colour.

4.3 Materials produced

Different types of promotional materials have been created for FindingPheno using the above brand identity and used during stakeholder and outreach events. These materials all prominently feature the FindingPheno logo and reference the brand identity and website for uniform look and feel across materials. Materials created include A5 notepads, flyers and name badges for in person events (see Figure 3), a 60x200cm roll up banner, PowerPoint templates, and an A4 pdf brochure summarising our project.

Figure 3: Physical materials prepared for the Stakeholder Synergy Meeting (see Section 4.5.1).

4.4 Digital Media

4.4.1 Website

The project website (www.findingpheno.eu, launched May 2021) is aimed to reach all audiences of the FindingPheno project, with the greater number of visits expected from those groups that are more technical and related to the subject matter of the project. The website functions as the outward-facing, online identity of the project providing all relevant information regarding the project and related issues for the general public, industry and researchers. It also includes a private intranet only accessible to members of the consortium.

The project website is developed, managed and hosted by UCPH (WP1 leader) under the responsibility of the FindingPheno Outreach Manager. It is hosted on the Wix platform using the Editor-X CMS and was launched in May 2021. The website has been continually updated, with the notable addition of a new resource section in January 2022. The FindingPheno website is currently divided into five main sections:

1. Pages describing the project.
2. A consortium section introducing the partners.
3. The project blog.

4. A page describe the events organised or participated in.
5. A resource section with teaching materials, videos, publications, newsletters, deliverables, and other downloads.
6. Private members only intranet with posting forums, groups and file share repository.

Since the website was set into production, the project website has been visited ca. 1000 times (954), comprising of 481 unique visitors. Each of these sites sessions, on average lasted for 9 minutes and 26 seconds. The engagement with the website was highest after the stakeholder meeting in October 2021, while settling to 1-2 visits a day in 2022. About a third of these site visits were direct visitors, while Google, Twitter and LinkedIn accounted for about 50% of the site visits.

4.4.2 Social media activity and engagement

The FindingPheno website includes links to our social media profiles as part of each page header and these profiles have the same branding as the main website to maintain our overall visual identity and project recognition (see *Figure 4*). The FindingPheno social media profiles are regularly updated by the Outreach Manager with input from other project partners to show FindingPheno as an active and interesting project, with a high level of cross-posting between social media and our main website. Our main focus has been on Twitter and LinkedIn as the most relevant to our outreach objectives and target audiences, while YouTube has been used to upload and store our project videos. Profiles for Facebook and Instagram have also been claimed although they are not currently active.

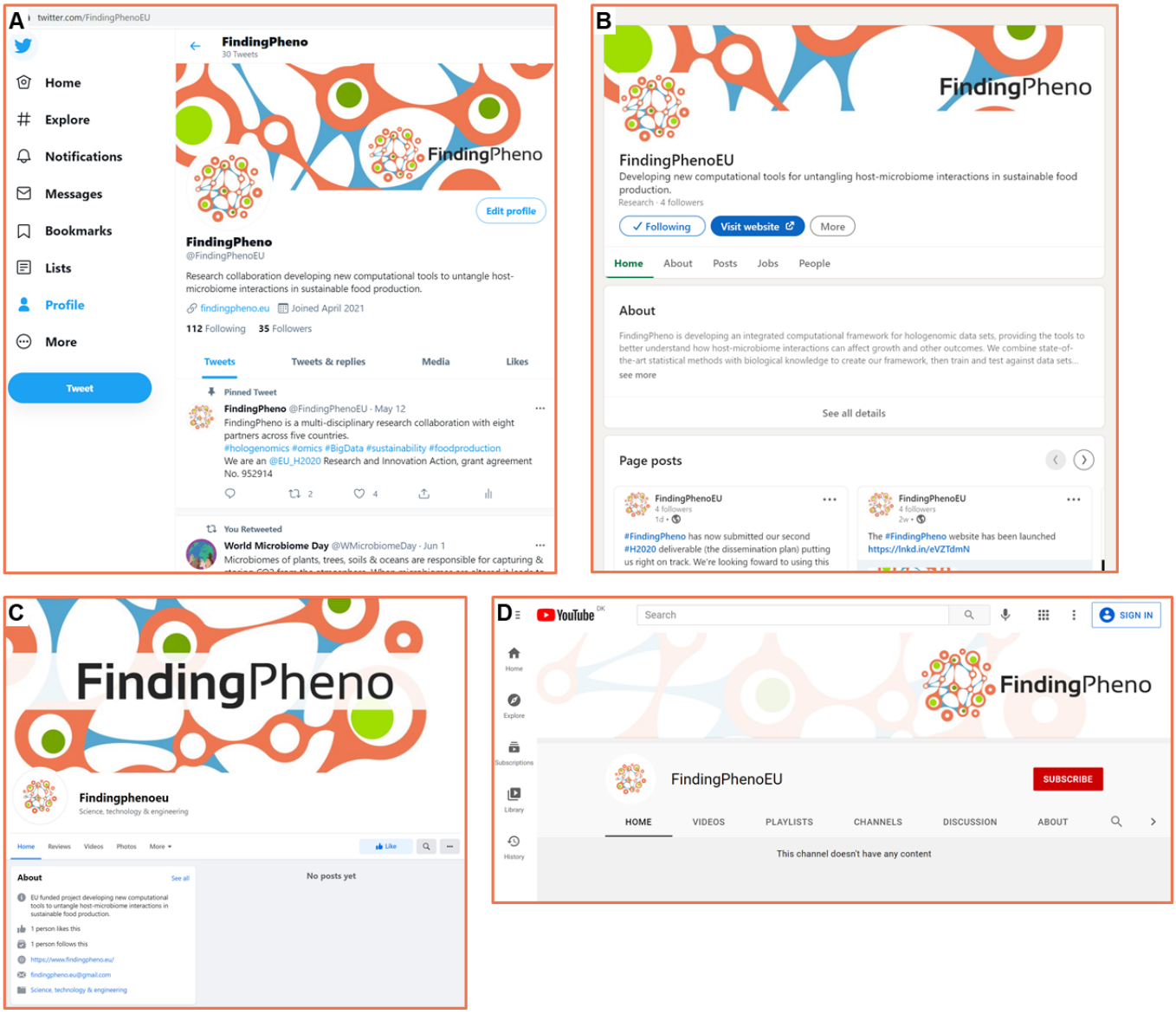

Figure 4: Screenshot of FindingPheno social media. A) Twitter, B) LinkedIn, C) Facebook, D) YouTube.

4.4.2.1 Twitter

Twitter is the main social media outlet for the project and the account is kept active with both original posts and regular reshares of related content (aiming for at least 4 days/week). Topic areas and accounts we consider relevant include project partners or direct collaborators; researchers working with microbiome/hologenomics or bioinformatics/data science/big data/omics; publicly funded projects (esp. H2020) working in the areas listed above plus projects related to sustainable food production; agriculture and sustainability policy makers; and EU or national funding bodies. We generally follow back any account which follows us as long as it is not clearly off topic or looks like a spam account.

4.4.2.2 LinkedIn:

The LinkedIn account is also kept active, mostly as a support to Twitter. This is because it reaches a different audience than Twitter, with more focus on companies and industrial researchers. Twitter posts are reformulated and posted on LinkedIn. Any relevant posts from project partners or key stakeholders are re-shared by the FindingPheno page, preferably with extra commentary and keywords. LinkedIn is also a good place to advertise events, both promoting our own and to find relevant events run by others (e.g. BaseClear's expert meetings). While LinkedIn does function as a job advertisement platform (especially in Denmark), academic jobs such as post-doc fellowships are more likely to be noticed on Twitter.

4.4.2.3 SoMe Campaigns

Coordinated SoMe campaigns were developed to support main project events and outcomes. These included:

- **Stakeholder Synergy Meeting**: A series of tweets were written introducing the speakers at our SSM event, with links to the twitter handles of relevant projects, organisations or people for each. These were posted in the days leading up to the event as advertising and giving a place for attendees to engage with us. Tweets and LinkedIn posts were also made during the event to highlight what we were doing.
- **Post-doc hiring campaign:** Post-doc ads were posted on both LinkedIn and Twitter whenever relevant. Advertisements were also placed on Euraxess, KD Nuggets job list, Machine Learning News (google group), and Women in Machine Learning (google group) where possible. In addition to these sites, national recruitment websites such as jobindex.dk were also used.
- **Researcher Cards campaign**: This campaign was run during the summer months of 2022 and consisted of regular twitter posts (approx. 2x/week) consisting of small "file card" images, each one introducing a FindingPheno researcher. The aim of this campaign was to show the range of competencies and expertise within the project, while also building the profiles of our participants. The bulk of the content was gathered from everyone at the Annual Meeting in May, then each image finalised and approved by email before release. While the background and layout of the images was created in Adobe Illustrator, this was then transferred to Microsoft PowerPoint to give an easily filled in template – leaving the option open to continue this campaign in the future if new people join.

4.4.2.4 SoMe Engagement

Twitter activity, in conjunction with outreach activities coordinated with other H2020 projects hosted at the same department as FindingPheno, has been the primary source of engagement with the wider audience. The twitter analytics (Figure 5) over the last 12 months, broken down into 3 month chunks, show consistent activity and engagement across each three month period, with some reduced activity and engagement over the summer months.

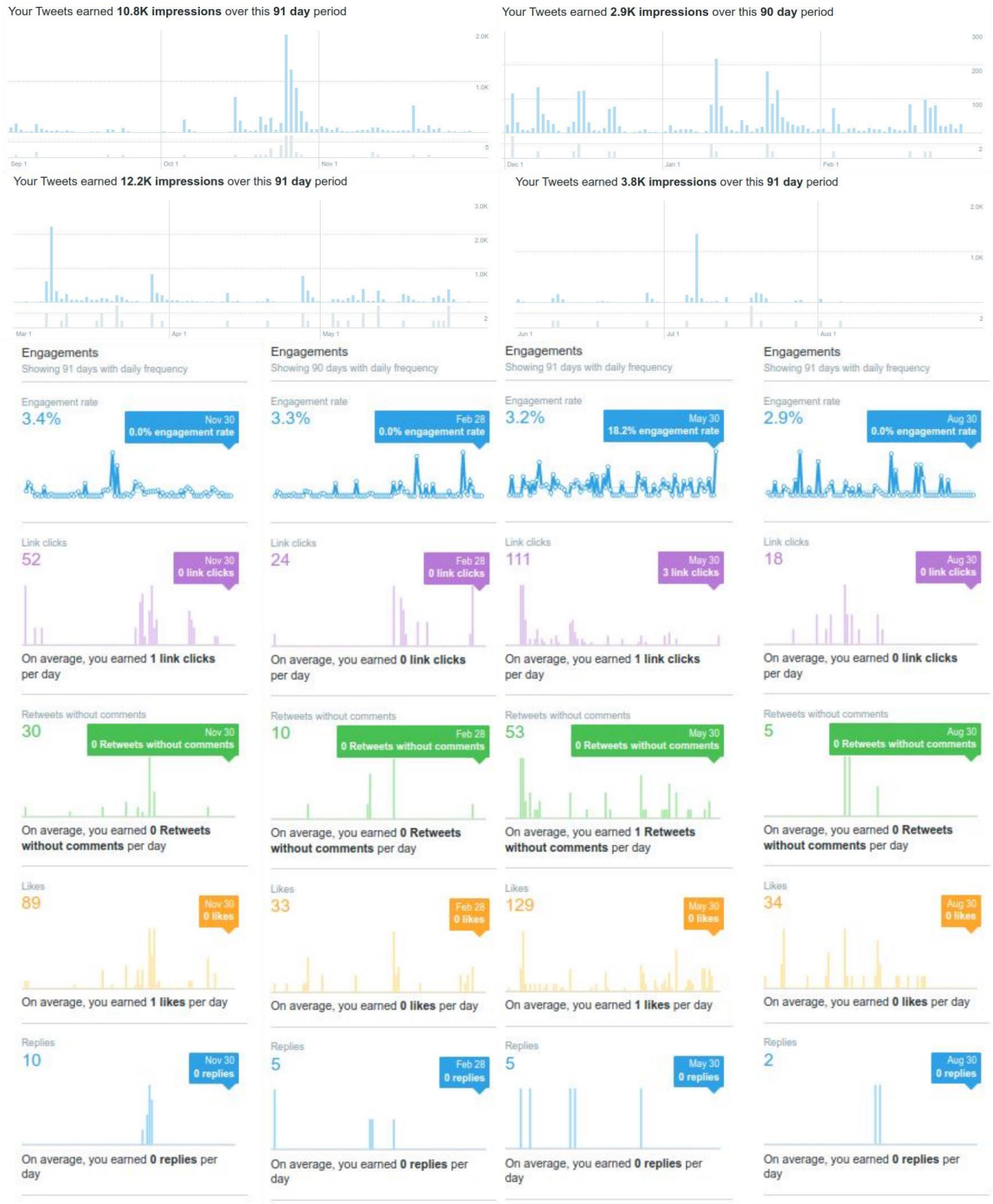

Figure 5: Engagement report from twitter analytics for period from Sep 2021 – Aug 2022.

4.4.3 Blog posts and external newsletter

The FindingPheno blog (*Figure* 6) provides monthly articles discussing the project progress and activities in detail while placing FindingPheno into the wider context of using microbiomes and big data to help feed the world. Each blog post is then repurposed into a mailchimp email newsletter which is manually sent to all subscribers to our mailing list.

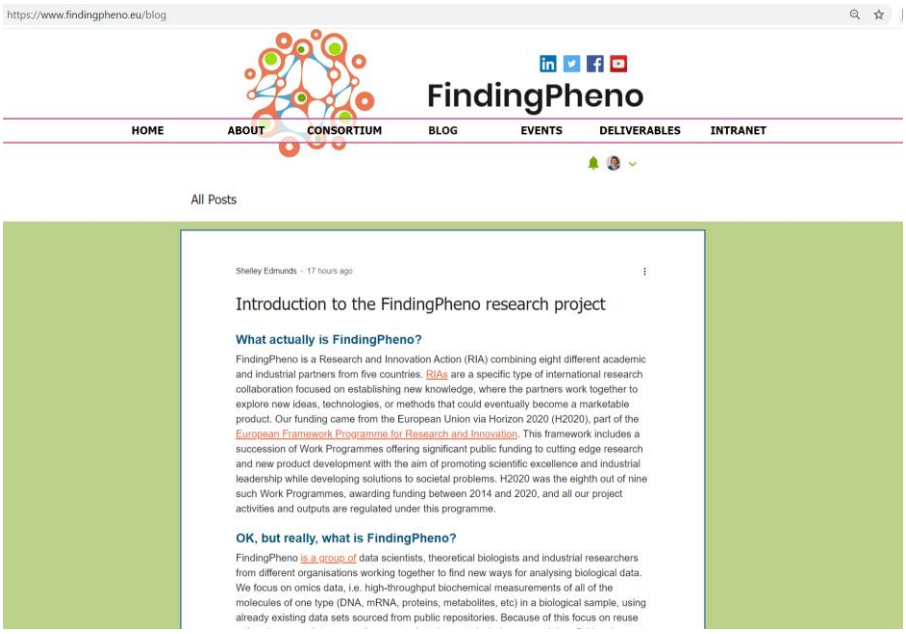

Figure 6: Screenshot of the FindingPheno blog.

Blogposts have been used on the FindingPheno website as a long-form method of engaging with the wider general audience on not only the goals/aims of the project, but also the broader applications of the big data methods on the argi/aqua culture and green economy. In this regard, the blogposts cover a wide array of topics ranging from the forms and methods of big data analysis, and describing the emergence of use of big data methods in pig farms and salmon nurseries to highlighting the importance of multi-omics approaches in answering biologically relevant questions. The blog posts have been posted roughly once a month, with a total of 21 blog posts being posted to date. With the hiring of the next crop of early career researchers on the project, the focus of the blogposts will be on the work done by the ECRs, and an opportunity to highlight their accomplishments, and a way for them to engage with other project members and a wider audience. Among the different sections of the websites, the blogs attracted about 9% of the total engagement among the visitors to the website. Within the blogposts, the different blog posts attracted equal attention.

4.4.4 Internal newsletter

A monthly email newsletter is prepared by the Project Manager using the Stripo email platform and sent to all FindingPheno participants. The newsletter includes project milestones, activities, upcoming deadlines, and a "For Your Interest" section with relevant publications, conferences, or webinars. This acts as a centralised source for project information and knowledge sharing. A total of 9 newsletters were sent within the first 18 months of the project to approximately 13 subscribed recipients.

4.4.5 Videos

This this first project period we have produced several short videos in service of our public outreach initiative, as listed in Table 4 below.

Table 4: FindingPheno videos.

No.	Video	Purpose + Target Audience	Release	Availability	Produced by
1	Project Plans	Internal seminar outlining what is planned for the project. Aimed at UCPH colleagues and general public.	February 2021	CEH YouTube (public)	Project Coordinator
2	Project introduction	Tell our department at UCPH that the project has started. Aimed at UCPH colleagues.	April 2021	CEH newsletter	Outreach Manager

3	Progress update	Show that the project is progressing, recorded as part of a group video with the Applied Hologenomics group. Aimed at UCPH colleagues.	June 2021	CEH newsletter	Outreach Manager
4	Stakeholder Synergy Meeting update	Introduce the event we just held, showing the strategy behind the planning and highlighting the positive outcomes. Aimed at other researchers and potential collaborators.	November 2021	CEH newsletter + FindingPheno YouTube (public)	Outreach Manager
5	Explainer video	Give an introduction to our project and what we are doing. Aimed at other researchers and potential collaborators.	April 2022	FindingPheno YouTube (public)	MadeClear + Outreach Manager
6	School video	Show how biologists and computer scientists can use machine learning, aimed at high school students.	May 2022	FindingPheno YouTube (public)	MadeClear + Outreach Manager
7	Annual Meeting update	Show project progress and update positive outcomes from the Annual Meeting. Aimed at other researchers and potential collaborators.	June 2022	CEH newsletter + FindingPheno YouTube (public)	Outreach Manager

The first video was recorded during a CEH seminar at UCPH just before the project began, where the Project Coordinator gave an introduction to what we are planning to do. These have then been supplemented by short update videos (Nos. 2-4, 7 in Table 4 above) recorded using loom.com for inclusion in the CEH newsletter as part of CEH's internal communication strategy. Where relevant, these videos where then uploaded to YouTube and publicised on social media (primarily Twitter) allowing them to also serve as updates for the wider research community and general public about how the project is progressing.

Two animated videos were produced during the first period by MadeClear, a science communication and film production consultancy. The first (No. 5 in Table 4 above) is an explainer video describing the problems FindingPheno is working on along with an introduction to how we are doing this. This video was developed in response to a recognised need within the project, where external researchers or other potential collaborators often asked for background information about the project when we first contact them. Therefore, the video was designed to introduce our project in an appealing way, catching the interest of the viewer and getting them up to speed on what we are doing so they are then ready to engage is a productive discussion with FindingPheno researchers. To serve this aim, the main target audience was scientists interested in our project although maybe not specialists in the same discipline, with recognition that is also available to the general public.

The second video (No. 6 in Table 4 above) was targeted to high school children with the aim of exposing them to the role the computer scientists can play in multi-omics research and give a general introduction to machine learning. The main aim for this video is to generate interest and enthusiasm for the types of technologies we are using by showing how it works that the problems it can solve. This video was also supported by a kahoot quiz and a webpage showing more detailed examples of where machine learning is used in biology. Each example was backed up by a longer blog post, thus providing content for this section of the website as well as associated social media posts and newsletters. A side benefit of the video production with MadeClear was the creation of professional illustrations for some key concepts which were provided as clean png files for use in other outreach and dissemination materials.

The videos made for the project were uploaded to both our website's resources section and to YouTube. On YouTube, the videos range from about 10-100 views, emphasising the need for further promotion of these

resources. On the website, the resources portion of the website hosting the videos received about 33% of the visitors to the website, with an average visit time of 7 minutes.

4.5 Events and networking

4.5.1 Stakeholder synergy meeting

The FindingPheno SSM was held in the Holst Auditorium, part of the Maersk Tower facilities in Copenhagen University (see here for more info), and ran from 9.30 to 4.30 on 27th October. Research areas covered were multi-omic analysis, microbiome research and sustainable farming, with each participant having direct experience with at least two of these subject areas. Overall, FindingPheno considered that this meeting was a success and that we achieved our goals of meeting future potential collaborators (especially from other publicly funded projects), sparking new ideas from the discussions, and building a positive reputation for FindingPheno within the relevant scientific community.

Fifty three people attended, representing 16 publicly funded projects (7 H2020 RIA, 2 H2020 IA, 1 H2020 Research Infrastructure, 1 MSCA-ITN, 1 MCSA IF, 2 DNRF Centers of Excellence, 1 GUDP, 1 IFD Grand Solutions) and coming from one of ten research organisations (mostly Universities) or 6 companies. They came from 11 countries across Europe, although 30 out of 53 participants were from Denmark and two countries were only represented by remote attendees. All attendees were asked to sign a GDPR permission form allowing us to store and publicise their names, affiliations and photos from the event online and share their contact details with other participants.

The meeting was well received and all feedback was positive. Each session kept to time, there were no technical or logistical issues, the catering was good with tasty food which everyone could eat, and the hybrid format worked well. In addition, audience engagement remained high throughout the event, with questions asked after each presentation and discussions continued during the coffee and lunch breaks. Key points which came up several times during the day were that it there is a need for better tools to integrate multi-omic data sets and that everyone struggles with making data structured, accessible and usable beyond an individual project.

Several FindingPheno partners indicated after the meeting that they made useful connections. For example, Qiagen met one of their key customers in person for the first time, strengthening that commercial relationship, while two researchers from different sections of The GLOBE Institute at UCPH found out that they actually have similar research interests and had a fruitful discussion about different mathematical modelling concepts – something they did not realise prior to the meeting despite working in the same overall research institute. Our Outreach Manager received similar feedback from several audience members who found it useful to connect or reconnect with the wider microbiome research community in person after the isolation of the past years due to the Covid 19 pandemic.

4.5.2 Public webinar

In recognition of World Microbiome Day 2021, FindingPheno collaborated with two other publicly funded research projects, HoloFood (H2020 GA 817729) and Earth Hologenome Initiative (Carlsberg Foundation), to plan and host a public webinar. This webinar featured three invited talks from hologenomics researchers outside of our organisations or projects, as follows:

- The role of the hologenome in defining group-identity in social insects. Yehuda Ben-Shahar, Professor of Biology at Washington University, USA. YouTube link.
- Omics in aquaculture: exploiting metagenomics and metatranscriptomics to improve seaweed domestication. Melisa Osborne and Kelly Deweese, PhD Candidates, University of Southern California, USA. YouTube link.
- Trials and tribulations of the avian gut microbiota in the urban mosaic. Marta Szulkin, Associate Professor, Wild Urban Evolution & Ecology Lab, University of Warsaw, PO. YouTube link.

The webinar was open to the public with free registration and was attended by 66 people from 19 different countries. The talks were recorded then uploaded to the CEH YouTube channel. We found that running an online webinar such as this was a relatively efficient and cost-effective way to share research, with a high level of interest

from both speakers and the audience and the only costs involved being our time. It also showed the strength of combining expertise and professional networks from the different projects as together we were able to put together an interesting line-up and well run event in relatively short time.

4.5.3 Project Meetings

FindingPheno held three project-wide meetings during the Reporting Period 1, as shown in Table 5.

Table 5: Project-wide meetings.

No.	Meeting	Dates Location	Purpose	Deliv.	Attendees
1	Kick Off Meeting	19 April 2021, online (zoom)	Bring together all participants for the first time and launch the project in a good way.	D8.1	23 attendees, all partners + EU project officer.
2	General Assembly	October 2021, Copenhagen DK	Meet in person alongside the Stakeholder Synergy Meeting. Project updates and discussions.	D1.3	21 attendees, all partners.
3	Annual Meeting	26-27 May 2022, Budapest HU	Project updates and discussions. Steering Committee Meeting.	D8.2	15 attendees, all partners except Qiagen and Njorth Bio.

These meetings have been universally well received with good discussions and enthusiasm from participants. They have been supplemented by quarterly update meetings between the Project Manager and main academic PIs and ad hoc smaller meetings as required for internal collaboration (either online or in person as relevant).

4.6 Scientific publications and conferences

As a Research and Innovation Action, FindingPheno has a strong focus on academic research and the generation of new ideas. Therefore, scientific publications in peer reviewed journals form an important part of our dissemination plan. The following xx publications have been submitted or accepted for publication during Reporting Period 1 (**Table 1**).

Table 1: FindingPheno publications from Reporting Period 1

Title	Authors	Year	Journal or Book Title	Reference	DOI	Open access?	Outreach activities?
The evolution of microbial facilitation: sociogenesis, symbiogenesis, and transition in individuality	István Zachar, Gergely Boza	2022	Frontiers in Ecology and Evolution		10.3389/fevo.2022.798045	Yes	
Quantifying the impact of ecological memory on the dynamics of interacting communities	Moein Khalighi; Didier Gonze; Karoline Faust; Guilhem Sommeria-Klein; Leo Lahti	2022	PLOS Computational Biology		10.1371/journal.pcbi.1009396	Yes	
A strategic model of a host–microbe–microbe system reveals the importance of a joint host–microbe immune response to combat stress-induced gut dysbiosis	István Scheuring, Jacob A, Rasmussen, Davide Bozzi, Morten T Limborg	2022	Frontiers in Microbiology		10.3389/fmicb.2022.912806	Yes	

4.7 Training activities

Describe in more detail the courses led by FindingPheno people (internal and external)

Table 2: FindingPheno training activities during Reporting Period 1

Title	Type	Date	Purpose	Organiser	Speakers	Audience
Machine Learning and Statistical Models for Microbiome	Internal	13-14 January 2021	Lectures and practical exercises giving participants an overview of analytical tools for multi-omics studies in R, particularly focusing on multi-omics tools and techniques to process microbial community data together with other omics. Participants should be able to preprocess and manipulate data, perform simple visualizations and statistical analyses, apply unsupervised and supervised machine learning, and produce robust and reproducible results.	UTU	-Associate Professor and project member -Postdoctoral researchers -Research Assistants -Research Fellow	-Project partners -project collaborators -advanced students (Postdocs) -applied researchers
How to use the Common Workflow Language	Internal	15-16June 2022	Developing skills across Europe for the development of professional workflows for the deployment on cloud computing environments	EMBL	-EMBL project partners -external trainer	Invitation-based event attended by project partners
Introduction to Hologenomics	Internal	25 May to 4 June 2021	Course providing participants with a solid theoretical and technical background in hologenomics. Students learn key concepts like holobionts, host-microbe interactions, multi-omnics and evolutionary adaptations. Course includes lectures, discussions of new literature, oral presentations, and group exercises to design a concrete case study	UCPH	-Associate and Assistant Professors at the UCPH Center for Evolutionary Hologenomics	-PhD students in biological, health and Life Sciences - Graduate students in Biostatistics, Bioinformatics, Immunology and Infectious Diseases, Veterinary Clinical Sciences

5 Impact and outlook

5.1 Achieved in Reporting Period 1

FindingPheno achieved important steps towards representing and communicating the work done by the consortium, using a wide range of opportunities to present the project to relevant stakeholders, although – as for any new project - there are few actual results to show. We have also made important steps towards developing

new relationships and collaborations outside of FindingPheno, widening our impact beyond our consortium and engaging with stakeholders we were not aware of at the start of the project. The achievements of the first reporting period provide a solid base for growing reach and enlarging audiences in the coming years.

5.1.1 Key Performance Indicators

Key Performance Indicators (KPIs) are tracked (Table 8) to measure project impact, ensuring that the project objectives are being accomplished. These KPIs are used to measure and assess the promotion activities in terms of their relevance, quality, and promotion channel.

Table 8: Key Performance Indicators (KPIs)

Indicator	Year 1 Feb 2022	Year 2 Feb 2023	Year 3 Feb 2024	Year 4 Feb 2025	Source & methodology
Accumulated number of peer reviewed articles published	3				Dissemination activity registry
Accumulated number of other external communication activities	1				Dissemination activity registry
Accumulated number of oral presentations	1				Dissemination activity registry
Accumulated number of relevant events attended by partners	1				Dissemination activity registry
Accumulated number of Twitter followers	295				Twitter analytics
Number of impressions on Twitter	29.5K				Twitter analytics
Top 3 geographical locations of followers	1. Denmark (29%) 2. USA (9%) 3. UK (8%) GB				
Accumulated number of page followers on LinkedIn	48				LinkedIn registry
Accumulated number of video views	290				YouTube registry
Accumulated number of newsletter subscribers	13				Internal subscriber list
Accumulated number of newsletters sent	9				Dissemination activity registry
Accumulated findingpheno.eu webpage views	954				Google Analytics
Accumulated number of external contact requests	N/A				Dissemination activity registry
Accumulated number of articles posted on the FindingPheno blog	20				Dissemination activity registry
Average blog post views	188				Wix Analytics
Qualitative engagement with blog posts, e.g. comments, reposts, mentions on other social media	3				Wix Analytics
Accumulated number of participants in webinars and workshops	>60				Participant lists

Meetings or other substantial direct contacts with external stakeholders	4		Partner records
Number of members to the project intranet	22		Wix Analytics

5.1.2 New collaborations

Following up on the stakeholder meeting in October 2022, there were several new collaborations and data sources that have now come into the orbit of FindingPheno. There are several levels of cooperation with these external collaborators, starting from them being a data source to hiring a joint early career researchers.

1. LowRRA: The coordinator of FindingPheno was invited to participate in LowRRA, a EU Horizon Europe RIA proposal, investigating the effects of low effect interventions in agricultural settings for pest control. In particular, FindingPheno would play the role of knowledge partner, helping design the multi-omics parts of the project for drosophila, and analysing the generated data. Unfortunately, this project, though well evaluated, did not get funded.

2. FARM-CARE: FARM-CARE is another EU RIA project hosted by the University of Copenhagen's veterinary school, investigating the physical and emotional wellbeing of pigs. FindingPheno has been invited to the project to help analyse the multi-omics data including the microbiome data from these pigs.

3. CrappyFish/HoloFish: These two closely related projects, funded by Norwegian Seafood Research Fund, investigates the hologenomics-phenotype axis for multiple food fish, including salmon and rainbow trout. For this, they have generated an array of hologenomics data, including host genomes, microbiomes, and health measures. FindingPheno has access to these data, and the data has been used in developing some of the models for our early publications.

4. SuPACow and ImprovAFish: New collaborations with Phillip Pope, a close collaborator from the Norwegian Univerity of Life Sciences, have led to access to data from two projects, SuPAcow and ImprovAFish, a Novo Nordisk Fund and ERA-NET funded projects respectively. Both these projects seek to modulate the feed-microbiome-host axis in cows and fish, respectively. We are currently working with these projects to obtain access to their data for validating our models.

5.2 Objectives for year 2

It is the goal for Reporting Period 2 to promote FindingPheno's emerging computational tools and new methodologies in addition to creating further awareness for the project and its potential impact. This will be achieved by greater involvement of the industrial partners within FindingPheno supplemented by input from selected target users and early adopters as identified during the first period. We will also increase our focus on scientific dissemination, with growing numbers of conference presentations and journal publications expected during this period.

5.2.1 Planned activities

The Global Outreach Action Plan shown in showed the main project activities planned for future reporting periods. More detailed plans will be developed just before the start of each project year to give concrete actions in the foreseeable time periods. Specific activities planned for the next period include:

- **Midway Stakeholder Symposium:** Organised by UTU and held in Turku, FI, in Q2 2023. This event aims to sharing early FindingPheno results and disseminate our developed models, with a target audience of potential and actual collaborators, microbiome/big data researchers and publicly funded projects, industry early adopters, and selected representatives of industry mid/late adopters and wider research community. It is expected that the 2023 Annual Meeting will be held in the same time and place.

- **Mechanistic Models of Microbiomes Training Course:** Internal training course facilitated by CER. To be held online with a target audience of FindingPheno partners and closely affiliated researchers. This course will focus on sharing knowledge about the microbial ecology methodologies and ideas used in WP6 by the researchers at CER.
- **Public Outreach Events:** We will continue to highlight FindingPheno research and researchers at a range of public outreach events held across Europe. This will include more webinars as already held, and increasing focus on in person events targeting both general public and other researchers as the project enters its second phase.
- **SoMe campaigns for publications:** We expect an increased number of peer reviewed publications and conference presentations as the project matures. These will be accompanied by coordinated social media campaigns such as blog posts, podcasts or explainer videos to support each one.
- **Networking and collaboration building:** Activities will continue in these areas with increasing focus on finding beta testers or new data sources for our new computational tools as they are developed. We will also continue looking for opportunities to build new consortiums or projects expanding on FindingPheno's outputs, and will continue to write funding proposals to support these ideas.

6 Conclusions

Dissemination, training and networking activities during Reporting Period 1 of the project were executed as planned in the PDER (D1.1). The KPIs adopted showed a good foundation in both activity level and engagement in all communication areas. Internal training has progressed as planned leading to good knowledge sharing and generation of new ideas within the consortium. Together all activities have resulted in significant networking within and beyond the project, with concrete new collaborations achieved especially with other H2020 funded projects in relevant areas. We look forward to building on this in the next reporting periods.