DELIVERABLE 4.1 - TRAINING PORTAL, VIDEO RECORDINGS AND MATERIALS

BioNT

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About this report

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Consortium members

Acronym	Partner
EMBL	EUROPEAN MOLECULAR BIOLOGY LABORATORY
BIOBYTE	BIOBYTE SOLUTIONS GMBH
HPCNOW	HPC NOW CONSULTING SL
UO	UNIVERSITETET I OSLO
UB	UNIVERSITAT DE BARCELONA
ZBMED	INFORMATION CENTRE FOR LIFE SCIENCE
RIcapacity	RIcapacity
ALU-FR	ALBERT-LUDWIGS-UNIVERSITAET FREIBURG
EPFL	ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE

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Project Overview

The BioNT consortium is dedicated to providing a comprehensive training program and fostering a community for digital skills relevant to the biotechnology industry and biomedical sector. With a curriculum tailored for both beginners and advanced professionals, BioNT aims to equip individuals with the necessary expertise in handling, processing, and visualising biological data, as well as utilising computational biology tools. Leveraging the consortium's strong background in digital literacy training and extensive network of collaborations, BioNT is poised to professionalise life sciences data management, processing, and analysis skills.

Preface

This report documents the establishment and publication of the BioNT project website as required under Deliverable 4.2 of Work Package 4 (Technical Infrastructure). The intended readership encompasses consortium partners, the European Commission, and the wider public, including training communities, potential adopters of BioNT materials, and professionals with an interest in digital skills development for the biotechnology and biomedical sectors.

BioNT training portal

The BioNT training portal (https://biont-training.eu/training.html) allocates all the educational output. It is designed to provide a seamless, self-paced learning journey for professionals in the biotechnology and biomedical sectors, ensuring that high-quality training remains accessible beyond the live sessions. This section went live during mid-March. The website template is published and maintained by ZB MED on behalf of the consortium. ZB MED commits to hosting and maintaining the website for five years beyond the end of the project funding period, ensuring continued public access to BioNT's outputs and resources.

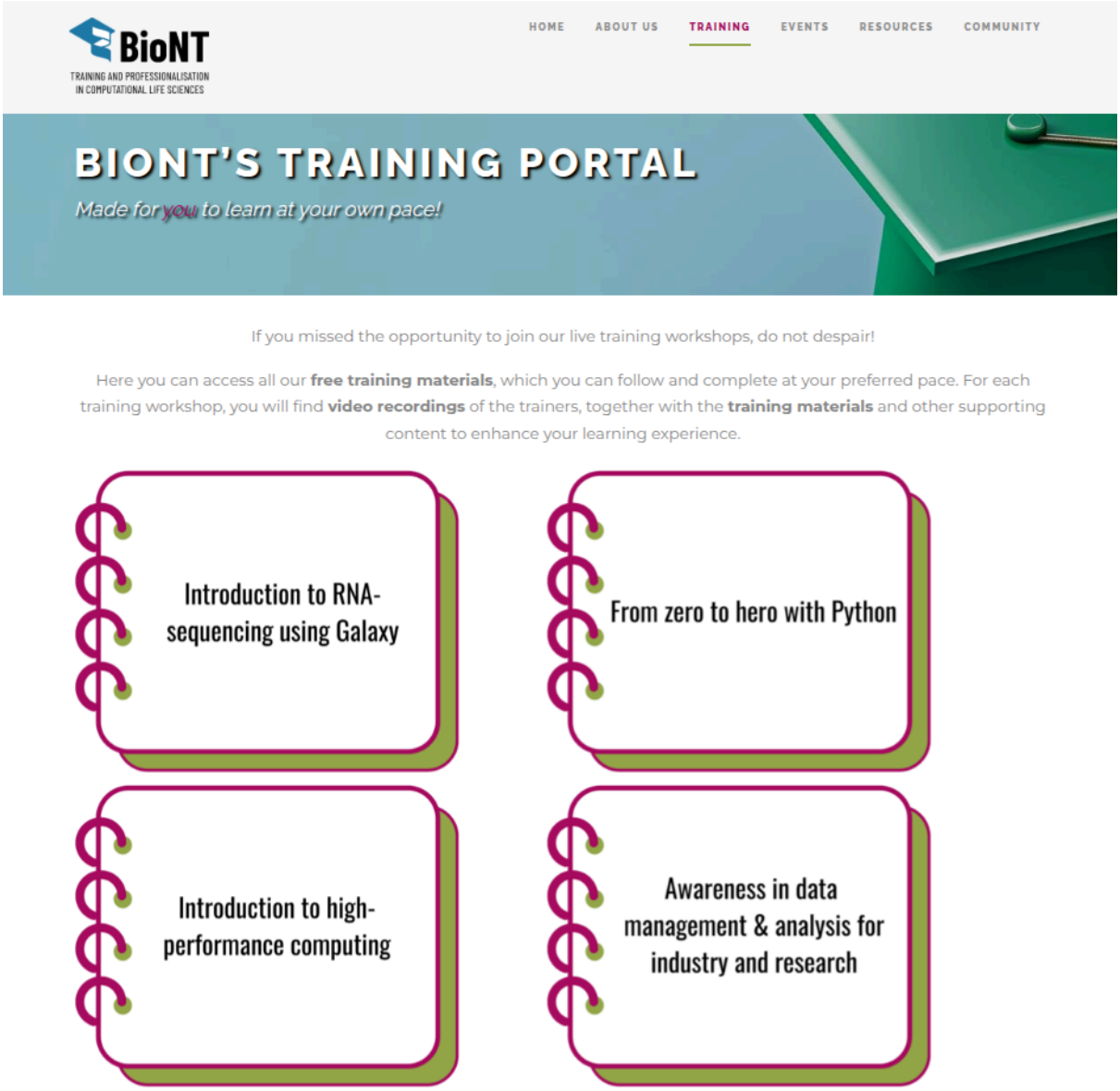

Figure 1: First view of the BioNT Training page

Training curricula and materials

The platform hosts a comprehensive suite of resources categorized into two primary tracks:

Basic curriculum

Targeted at individuals with limited prior experience in biological data processing, this curriculum focuses on foundational digital literacy. All the training of the basic curriculum has a dedicated webpage accessible by clicking on the notebook shapes with the workshop title. The following workshops are featured:

A Practical Introduction to Bioinformatics and RNA-seq using Galaxy

This course teaches how to navigate the Galaxy platform for reproducible research. Improving the skills of quality control of sequencing data, mapping, and differential expression analysis without requiring command-line expertise.

From Zero to Hero with Python:

Fundamental programming logic tailored for biological data, teaches data types, loops, conditional statements, and using libraries (e.g., Pandas) for data manipulation.

An Introduction to High-Performance Computing (HPC):

This training empowers users when moving from local computing to cluster environments by teaching how to understand schedulers (SLURM), the Unix shell, and remote file management.

Awareness in Data Management and Analysis for Industry and Research

The course explores good research practices, data management plans, and the FAIR Data Principles. Trainers learn practical strategies for organising data, using electronic lab notebooks, and making computational analyses more reproducible.

Training page

Every course from the Basic Curriculum has a dedicated webpage where information like the description, learning outcomes, target audience and requirements can be found. At the bottom, the training material is linked, alongside with the information about the trainers for that course.

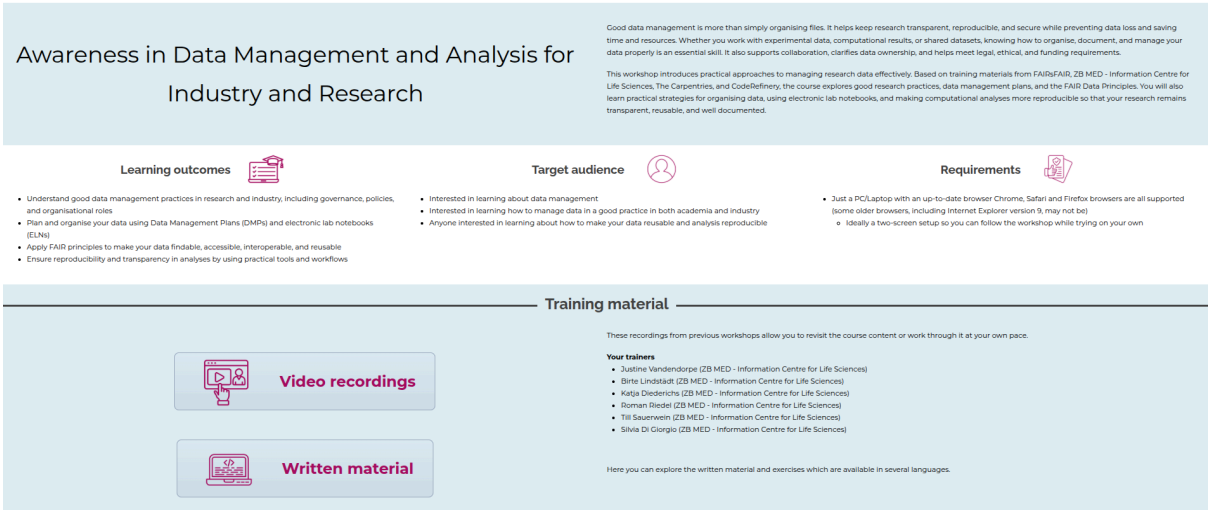

Figure 2: Look of the dedicated page for the Awareness in Data Management and Analysis for Industry and Research workshop

Training materials

The teaching materials include the video recordings taken live from the training day and edited afterwards with AI support . These videos are hosted on the Lhumos platform, hosted by EPFL. In addition, extensive written materials (handouts, tutorials, and practical exercises) are linked.

To ensure inclusivity and reach across the European landscape, these materials are available in multiple languages, catering to diverse regional needs within the SME and research sectors. The materials are available in English, Spanish, Italian and German.

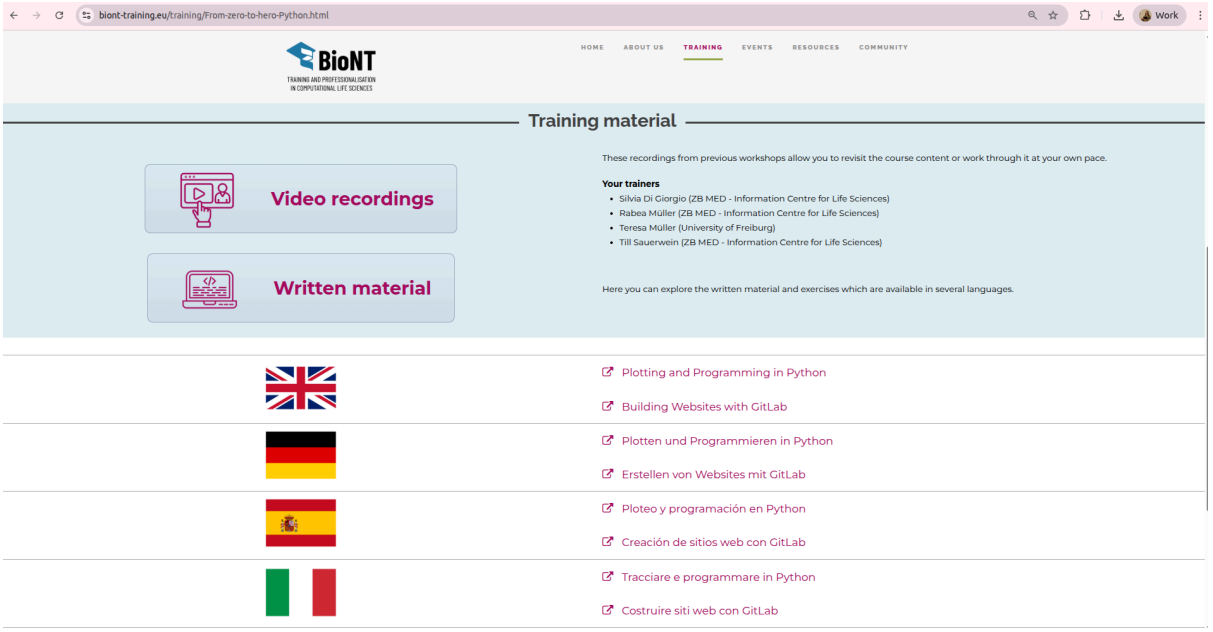

Figure 3: Look of the dedicated page of the From Zero to Hero with Python course where the written materials are translated to diverse languages within the EU

Advanced Curriculum:

The implementation is in the final stages and will be incorporated into the BioNT Training Portal in the next couples of days. Detailed materials covering advanced topics (such as Machine Learning for biological data and HPC System Administration) are scheduled for publication within the coming days. This will complete the project's training offering.

Methodological approach: "The Carpentries" model

BioNT adopts the "Carpentries" pedagogical style, characterized by:

- **Live Coding:** Instructors lead learners through real-time exercises.

- **Interactive Feedback:** Use of collaborative documents (e.g., HedgeDoc) and "sticky notes" (virtual or physical) to gauge learner progress.
- **Open Educational Resources (OER):** All materials are hosted on GitHub, Zenodo and the Galaxy Training Network (GTN), ensuring they are freely reusable under Creative Commons licenses.

Video recordings - Lhumos platform

Lhumos (Learning Hub for Modelling and Simulation) is a specialized e-learning environment co-supported by major European initiatives (CECAM, MARVEL, MaX). For the BioNT project, it functions as a Self-Paced Learning Environment, allowing learners to revisit workshop content outside of live sessions. The Lhumos space is currently in its deployment phase (Alpha). Users can track the growth of the repository as new workshops from the 2024–2026 cycle are concluded and curated.

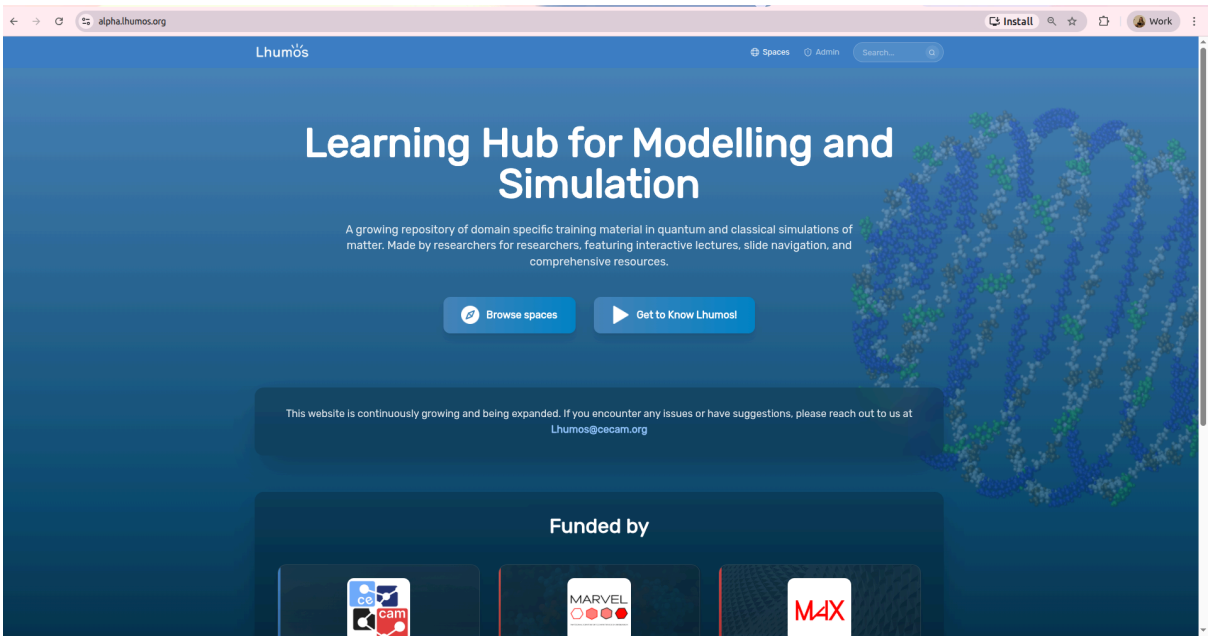

Figure 4: Screenshot of the Lhumos main page

BioNT space

BioNT has a dedicated space inside Lhumos, where all the video recordings from the training sessions are organized in collections.

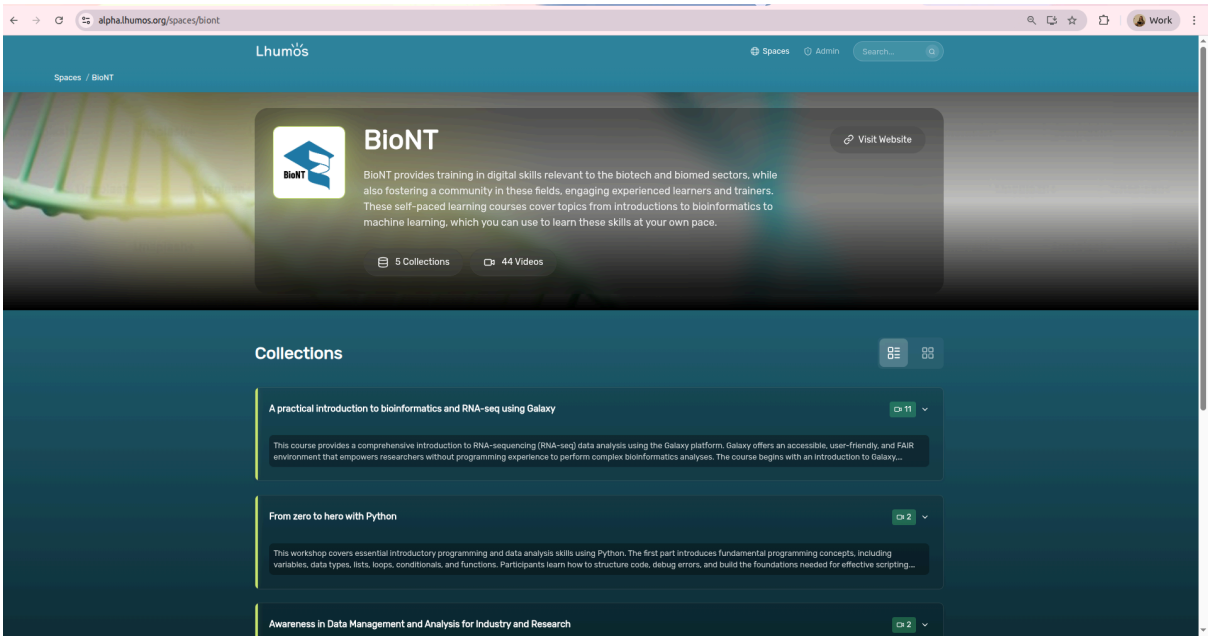

Figure 5: View of the BioNT space inside Lhumos

Every collection can be accessed to see the description of it and the corresponding video recordings. For the moment only the basic curriculum is available in the BioNT space.

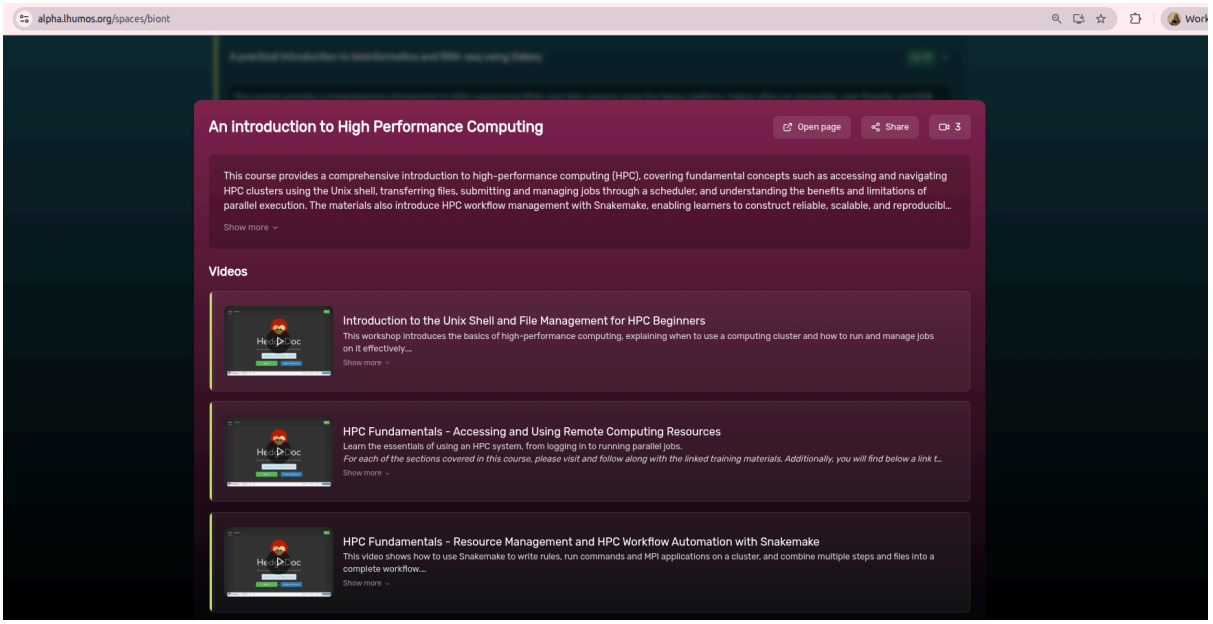

Figure 6: View of a BioNT collection inside Lhumos

Lhumos features an admin panel where the views of the videos and the collections can be consulted.

Figure 7: From Zero to Hero with Python

The top collection is From Zero to Hero with Python, and collections get a daily average of two views.

Zenodo materials

The presentations used in workshops can also be found in Zenodo under the [BioNT community.]

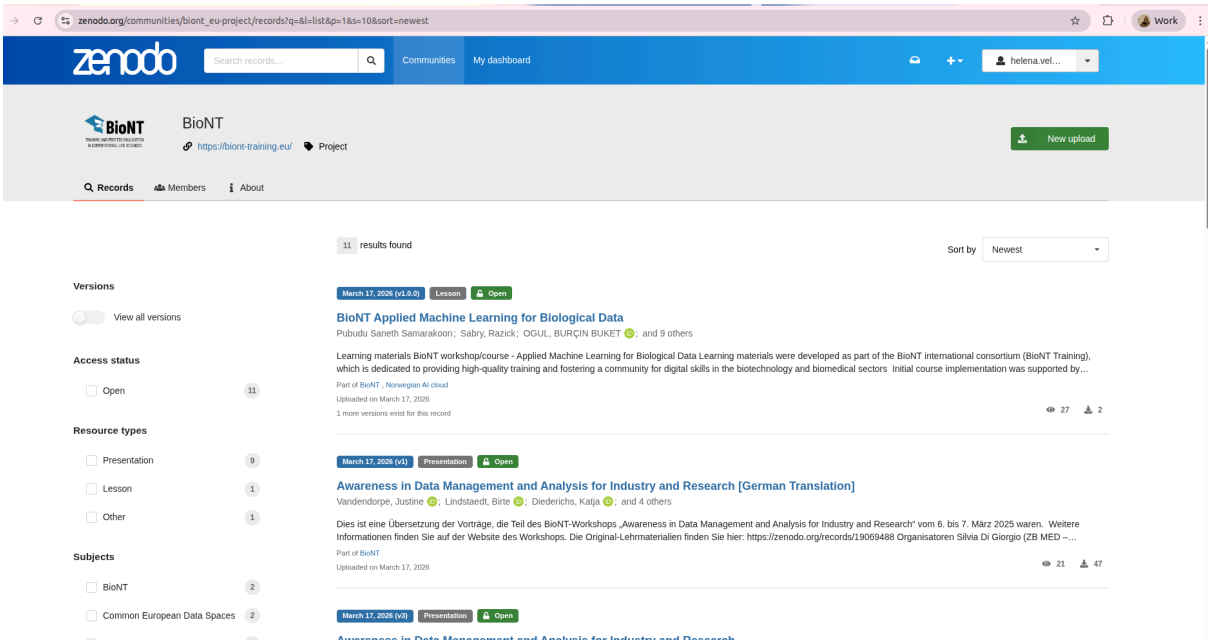

Figure 8: BioNT community in Zenodo

The materials are free to view and at the moment slides from the advanced curriculum are included too.

This use of Zenodo ensures the content is freely reusable under Creative Commons licenses, supporting the project's broader goal of digital upskilling in Europe and ensuring a broad and long-term hosting space even after the end of the project funding window.

Galaxy content

Some of the written materials are part of the Galaxy Training portal. The materials contain explanations, hands-on demonstrations and exercises with their solutions for the trainees to practice and evaluate their skills.

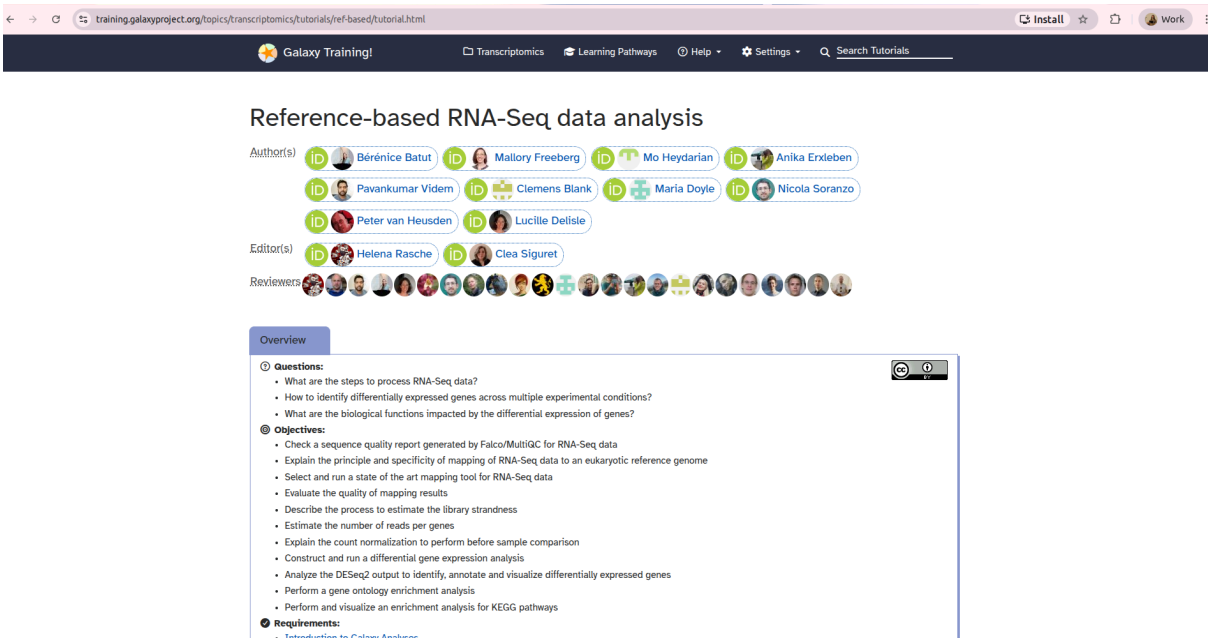

Figure 9: BioNT Galaxy material introduction

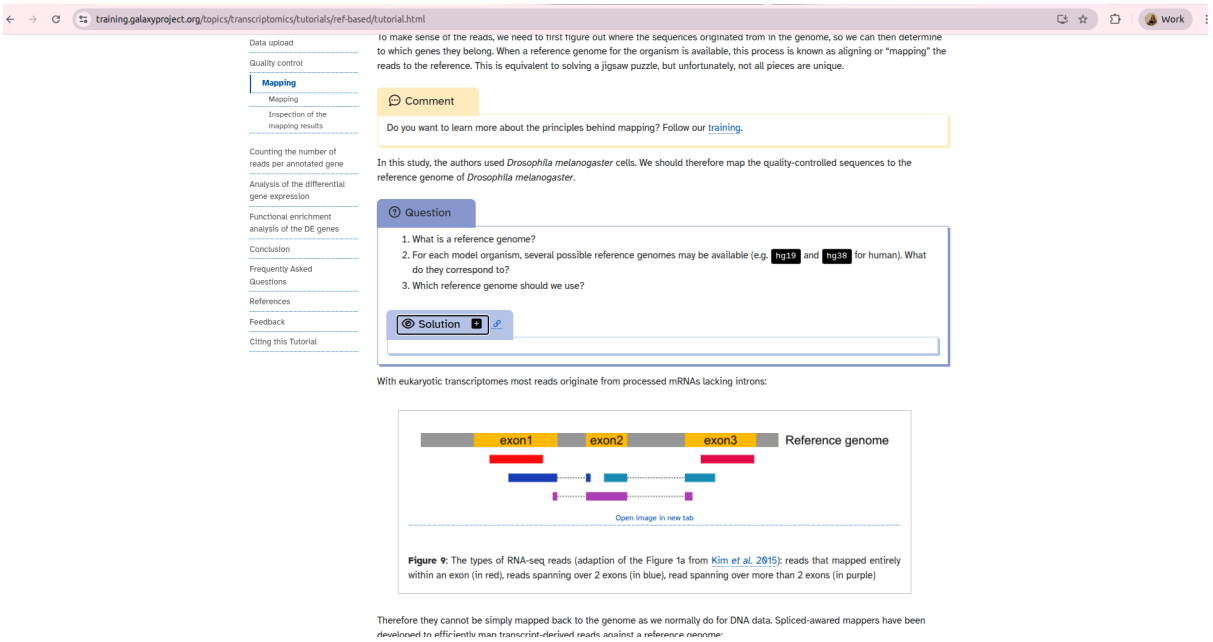

Figure 10: BioNT Galaxy material with exercises

Dissemination and promotion

The training portal was promoted via LinkedIn and received a good response from the community, with 18 times shared by today.

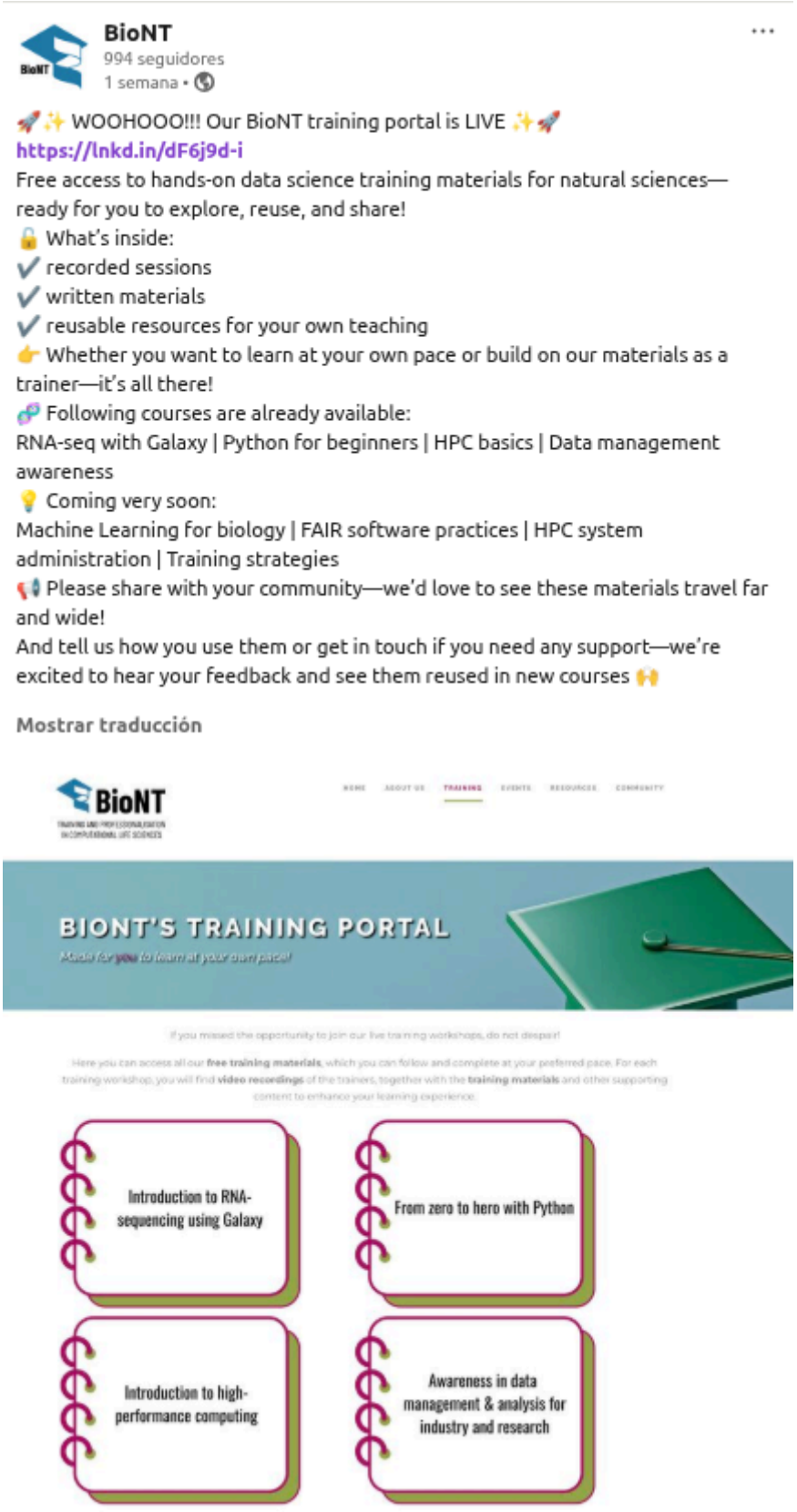

Figure 11: LinkedIn post to promote the new training website

Conclusion and sustainability

The BioNT curriculum represents a scalable model for digital upskilling in Europe. By integrating training with established networks like ELIXIR, Galaxy Project, and platforms like Zenodo, the consortium ensures that the training content remains maintained and relevant beyond the initial funding period of 2023–2026.