

# Update from the Inter EURL working group on NGS



**Istituto Superiore di Sanità, Food Safety, Nutrition and Veterinary Public Health Department,  
European Union Reference Laboratory for *Escherichia coli***



# INTER EURLs WORKING GROUP ON NGS



## AIM

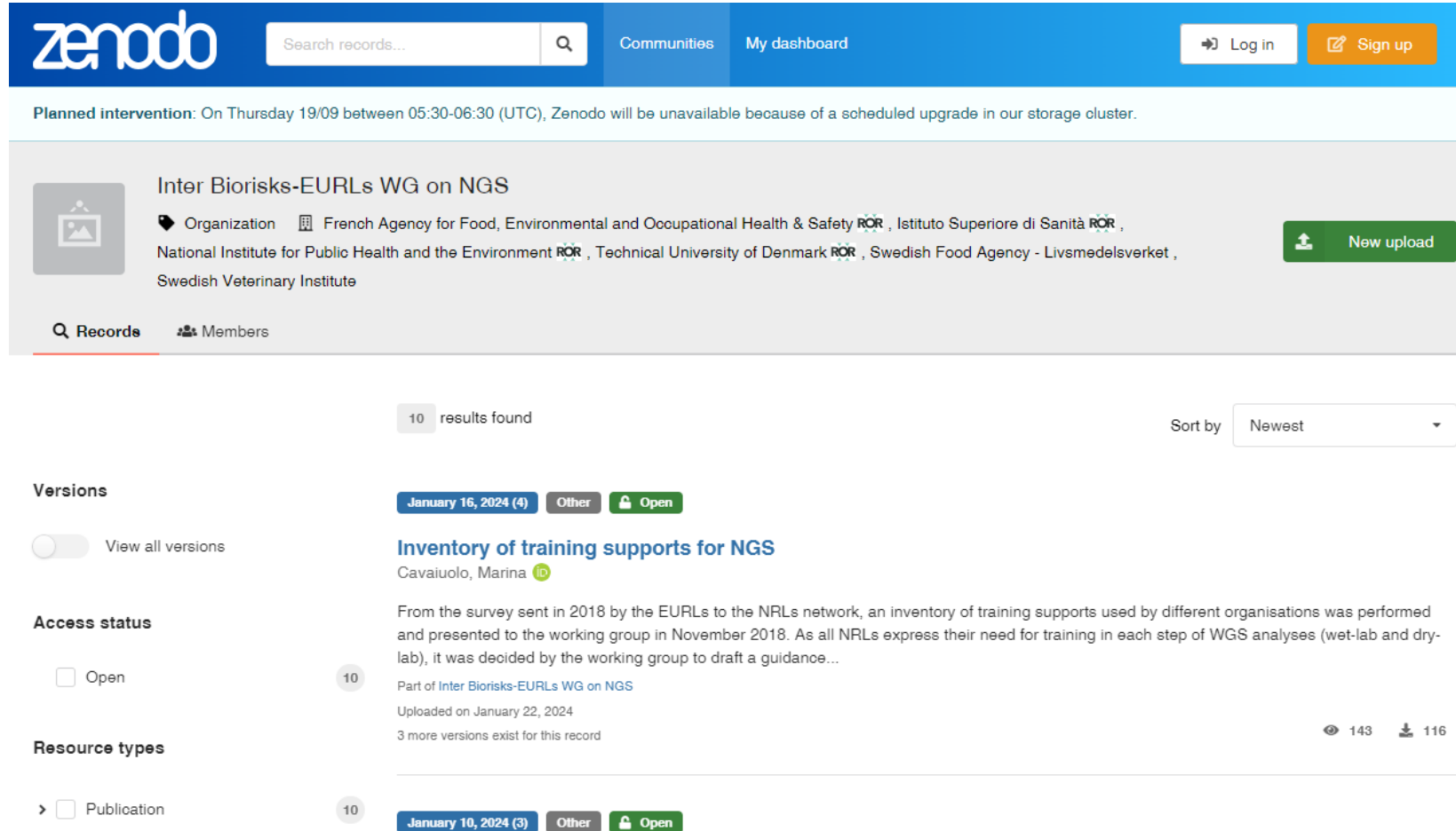
to promote the use of WGS across the EURLs' networks, build WGS capacity within the EU and ensure liaison with the work of the EURLs and the work of EFSA and ECDC on the WGS mandate sent by the Commission

from  
November 2017

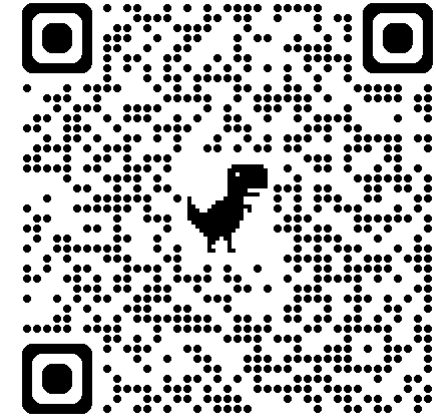
Meeting twice a year  
(14 meetings done)

# Inter EURLs WG webpage

The webpages of each EURL contain the direct link to the  
**new webpage dedicated to the Inter EURLs WG on NGS**



The screenshot shows the Zenodo interface for the community 'Inter Biorisks-EURLs WG on NGS'. At the top, there's a blue header with the Zenodo logo, a search bar, and links for 'Communities', 'My dashboard', 'Log in', and 'Sign up'. Below the header, a message states: 'Planned intervention: On Thursday 19/09 between 05:30-06:30 (UTC), Zenodo will be unavailable because of a scheduled upgrade in our storage cluster.' The community header includes a profile picture, the name 'Inter Biorisks-EURLs WG on NGS', a list of member organizations (French Agency for Food, Environmental and Occupational Health & Safety, Istituto Superiore di Sanità, National Institute for Public Health and the Environment, Technical University of Denmark, Swedish Food Agency - Livsmedelsverket, and Swedish Veterinary Institute), and a 'New upload' button. Below this, there are tabs for 'Records' and 'Members'. The main content area shows '10 results found' and a 'Sort by' dropdown set to 'Newest'. The first result is titled 'Inventory of training supports for NGS' by Cavauiuolo, Marina, with a date of 'January 16, 2024 (4)' and an 'Open' status. The description mentions a survey from 2018 and a guidance document. It also shows '143' views and '116' downloads. The second result is partially visible, dated 'January 10, 2024 (3)'.



Direct link!

[https://zenodo.org/communities/eurls-biorisks\\_wg\\_on\\_ngs](https://zenodo.org/communities/eurls-biorisks_wg_on_ngs)

All the versions of all the documents are always available on Zenodo  
The new versions always appear as first choices

# Supporting documents available

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[Overview of conducted and planned PTs](#) – curated by EURL Antimicrobial Resistance

[Reference Whole Genome Sequencing collection](#) – curated by EURL *Salmonella*

[Guidance document for WGS-laboratory procedures](#) – curated by EURL Parasites

★ [Bioinformatics tools for basic analysis of Next Generation Sequencing data](#) – curated by EURL VTEC

[Guidance document for Whole Genome Sequencing - cluster analysis](#) – curated by EURL *Campylobacter*

[Guidance document for NGS-Benchmarking](#) – curated by EURL *Listeria*

★ [Inventory of training supports](#) – curated by EURL Coagulase Positive *Staphylococci*

[Survey on the use of NGS across the NRLs networks](#) – curated by EURL VTEC

[Supporting document for preparing high quality DNA for Whole Genome Sequencing](#) – curated by EURL VTEC

in continuous update

# Webinar dedicated to NGS PTs

## Proficiency Tests on Next Generation Sequencing: approaches in use at the European Union Reference Laboratories

Friday September 29<sup>th</sup> 2023, 10 am - 12 am

Online through Microsoft Teams

Organised by the Inter EURLs WG on NGS, involving:

EURL-AMR

EURL-*Campylobacter*

EURL-Coagulase Positive Staphylococci (CPS)

EURL-Foodborne viruses

EURL-*Listeria monocytogenes*

EURL-Parasites

EURL-*Salmonella*

EURL-VTEC

**178 participants**  
**29 Countries**

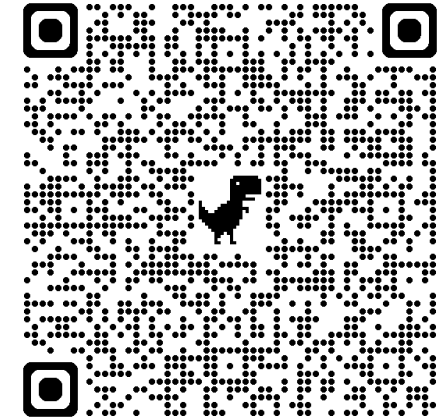
22 EU Member States

3 EEA + EFTA

2 EU Candidates

2 Extra EU

1 EC



<https://www.iss.it/en/-/proficiency-tests-on-next-generation-sequencing-approaches-in-use-at-the-european-union-reference-laboratories-webinar-29-september-2023->

Presentations have been published on EURL *E. coli* website and mirrored in all the websites of the other EURLs



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# 3rd joint training – June 25th-26th 2024, Uppsala (Sweden)

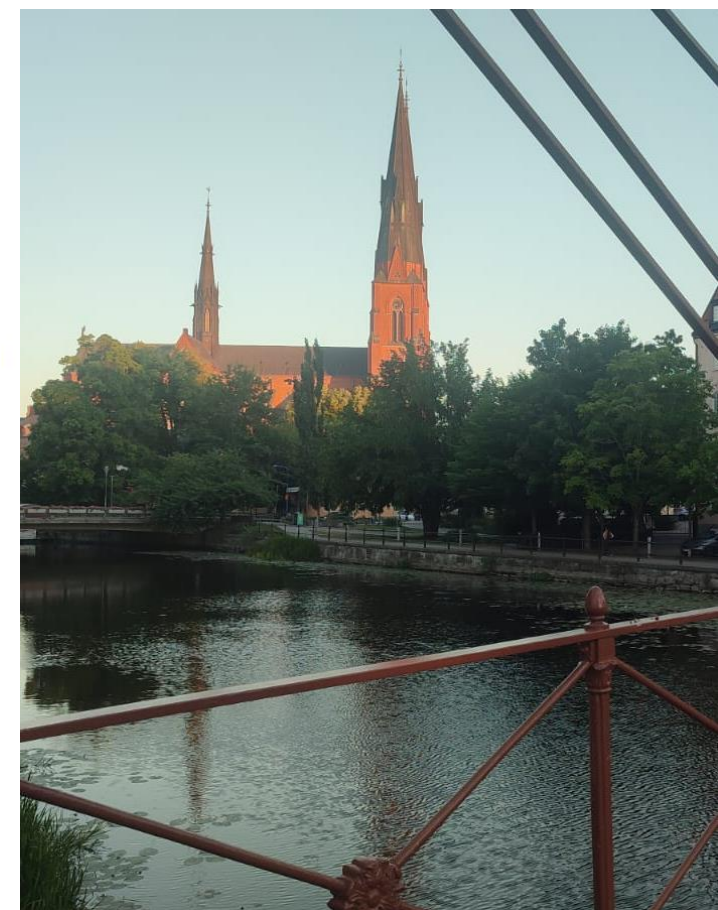
## Introduction to Bioinformatics for genomic data mining

### TUESDAY 25 JUNE 2024

8.45	<b>Registration (for entering the premises of SVA)</b>
09.00	Welcome and general overview of the joint training activities (Hanna Skarin, EURL-Campylobacter)
09.15	Introduction of the inter EURLs Working Group on NGS and the guidance documents released (Valeria Michelacci, EURL-VTEC)
09.30	Introduction to WGS <ol style="list-style-type: none"><li>1. Sequencing platforms &amp; output data (20') (Maroua Sayeb, EURL-Listeria monocytogenes)</li><li>2. Verification of the integrity of the raw data files (like md5sum) (10') (Angela van Hoek, EURL-Salmonella)</li><li>3. Bioinformatics analysis of NGS data: approaches and opportunities (command-line tools, commercial software, webserver) (20') (Joakim Skarin, EURL-Foodborne viruses)</li></ol>
10.20	<b>Coffee break</b>
10.50	Introduction to quality check and trimming (Valeria Michelacci, EURL-VTEC)
11.10	<b>Hands-on exercises – Quality check and trimming</b> Quality check and trimming using different tools and platforms. Results interpretation. <i>FastQC and Positional and Quality Trimming on ARIES</i> (Valeria Michelacci, EURL-VTEC) <i>Demo: Quality check and trimming with alternative tools</i> (Bo Segerman, EURL-Campylobacter)
12.30	<b>Lunch break</b>
13.40	Introduction to assembly and assembly statistics (Lauge Holm Sørensen, EURL-AMR)
14.00	<b>Hands-on exercises – Assembly statistics</b> Assembly statistics using different tools and platforms. Results interpretation. <i>Hands-on SPAdes and Quast from ARIES</i> (Luca De Sabato, EURL-VTEC)
15.00	Introduction to data alignment (Paolo Vatta, EURL-Parasites)
15.20	<b>Hands-on exercises – Mapping approach</b> <i>Hands-on E. coli virulotyping using a mapping approach</i> (Rosangela Tozzoli, EURL-VTEC) <i>Demo: Mapping with Seqsphere</i> (Maroua Sayeb, EURL-Listeria monocytogenes)
16.20	Amplicon-based sequencing of viral genomes (Luca De Sabato, EURL-VTEC)
17.00	<b>End of the first day</b>
19.00	Optionally, a group dinner will be organised (at own costs)

### WEDNESDAY 26 JUNE 2024

8.45	<b>Registration (for entering the premises of SFA)</b>
9.00	Introduction to gene detection using BLAST approach (Marina Cavaiuolo, EURL-CPS)
9.15	<b>Hands-on exercises – Search of genetic features on contigs</b> Identification of virulence and AMR genes using different tools and platforms. Results interpretation. Demonstration of genes identification on contigs through different platforms. <i>Hands-on ResFinder on CGE webserver</i> (Lauge Holm Sørensen, EURL-AMR) <i>Demo: Salmonella virulotyping with Seqsphere</i> (Angela van Hoek, EURL-Salmonella)
10.10	Introduction to genome comparisons: gene-by-gene vs SNP approach (Bo Segerman, EURL-Campylobacter)
10.30	<b>Coffee break</b>
11.00	Demonstration of gene-by-gene approach through different platforms: ARIES (Rosangela Tozzoli, EURL-VTEC) Starflow (Maroua Sayeb, EURL-Listeria monocytogenes and Marina Cavaiuolo, EURL-CPS) Seqsphere (Angela van Hoek, EURL-Salmonella)
11.45	Parasites WGS: opportunities and challenges (Simone Cacciò, EURL-Parasites)
12.15	<b>Lunch break</b>
13.15	<b>Hands-on exercises – Visualisation of clustering data</b> Demonstration via Grapetree (Maroua Sayeb, EURL-Listeria monocytogenes)
13.45	The EFSA One Health WGS database and demo (Mirko Rossi, EFSA)
14.45	Wrap up (Magnus Simonsson, EURL-Foodborne viruses)
15.00	<b>Closure</b>

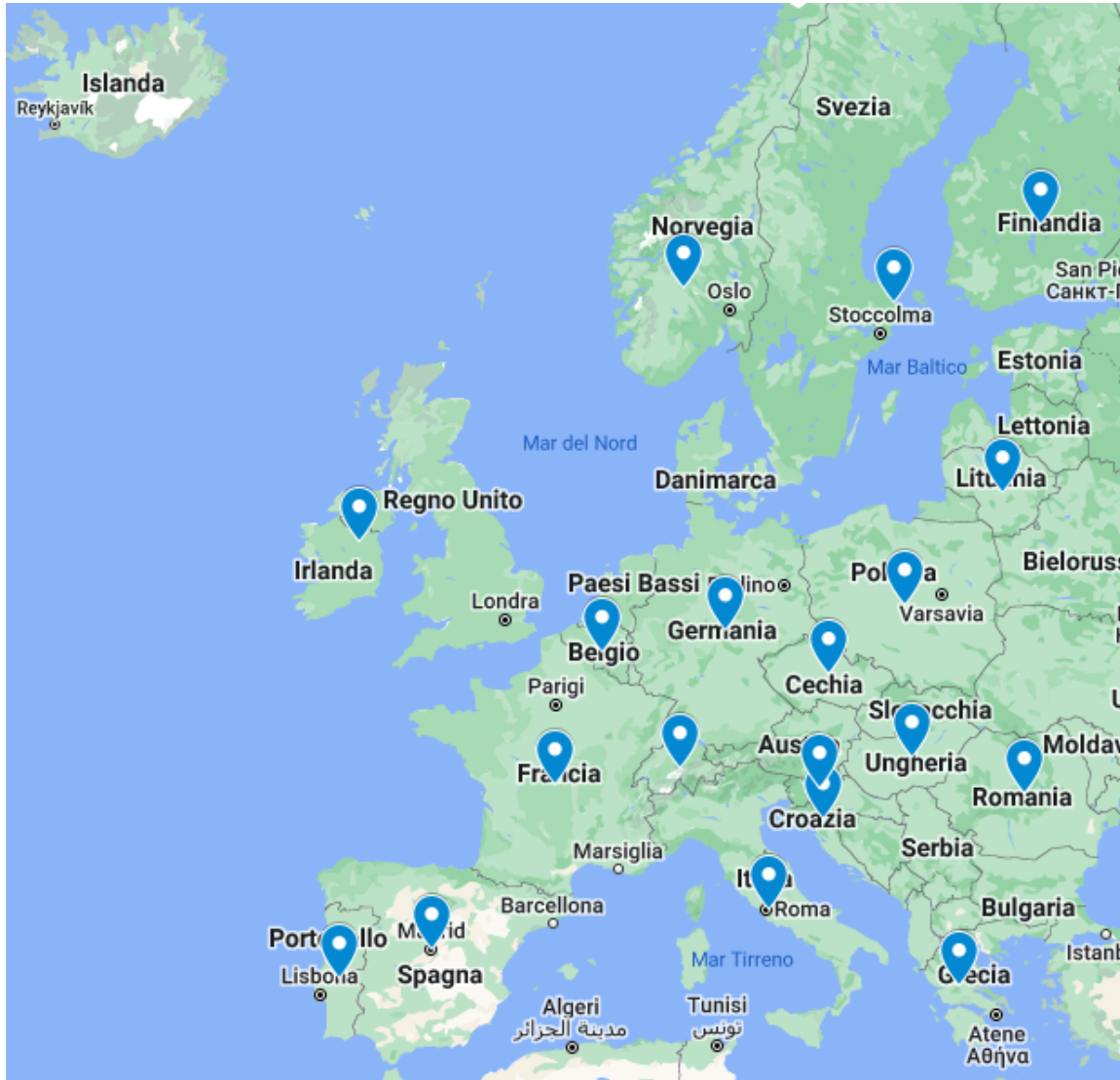








# Participants – geographic distribution



**28 participants from different NRLs**

7 at own costs

3 supported by EURL VTEC

**19 different countries**

(17 Member States + 2 EFTA/EEA)

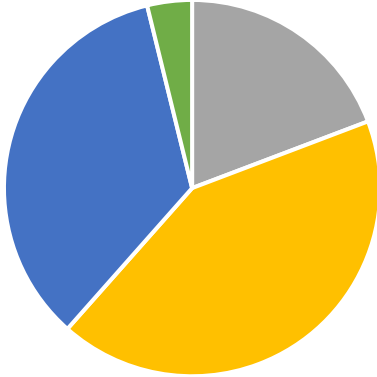
**Many participants came from labs appointed as NRLs for multiple pathogens**



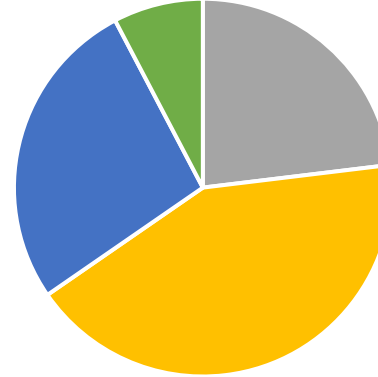
# Training satisfaction survey

■ Poor ■ Fair ■ Good ■ Very good ■ Excellent ■ No opinion

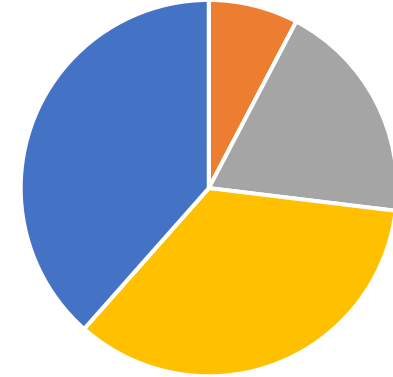
4: Relevance of topics presented



5: Completeness of the presentations



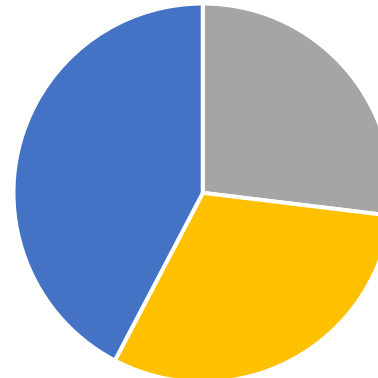
6: The ratio theory and "Hands-on exercises"



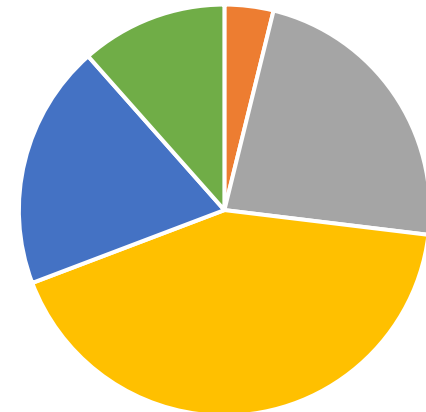
7: Possibilities and time for questions



8: Did the training comply with your expectations



9: Is the training applicable in your laboratory



# Work in progress

- Supporting document for **Quality Check of NGS data** (EURL *Listeria* lead)

The topic will be discussed in a specific meeting of the WG in October to start drafting the document

- Supporting document for **Wet-lab part of sequencing viral genomes** (EURL Foodborne Viruses lead)

In preparation

- **Webinar** dedicated to reference whole genome sequences

In discussion for 2025





*Questions?*

*Suggestions?*