

Updates from Inter EURLs Working group on NGS

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Bo Segerman

EURL-*Campylobacter*

SVA Sweden

The working group

EURL-*E. coli* (coordinator) (ISS-Italy)

EURL-*Listeria monocytogenes*
(ANSES-France)

EURL-*Coagulase Positive Staphylococci*
(ANSES-France)

EURL-*Salmonella* (RIVM Netherlands)

EURL-*Campylobacter* (SVA Sweden)

EURL-*Parasites* (ISS-Italy)

EURL-*Antimicrobial Resistance*
(DTU Denmark)

EURL-*Food borne viruses* (SLV-Sweden)

Observers: SANTE G4, EFSA, ECDC

Aims

- Promote the use of NGS/WGS across the network of the EURLs
- Build NGS/WGS capacity within the EU
- Ensure liaison with the work of the EURLs and the work of EFSA & ECDC on the WGS mandate sent by the Commission

Published Guidance documents

- **Overview of** conducted and planned **proficiency tests** (PTs)
- **Reference WGS collection**
- **NGS laboratory procedures**
- **Bioinformatics tools** for basic analysis of NGS data
- **Cluster analysis** of WGS data
- **NGS-Benchmarking**
- **Inventory of training** supports
- **Survey** on the **use of NGS** across the NRLs networks
- **Preparing** high quality **DNA** for WGS

https://zenodo.org/communities/eurls-biorisks_wg_on_ngs

Annual Joint training course

- 2022 - ISS
- 2023 - RIVM
- 2024 - SVA/SFA
- 2025 - ANSES

Typical Course Overview

WGS basics – Sequencing platforms, data integrity, bioinformatics approaches

Quality control & trimming – Concepts, & demo/exercise

Assembly & statistics – Theory & exercise

Mapping approaches – Theory & demo/exercise

Amplicon sequencing – Viral genome applications

Gene detection – BLAST and tools for AMR/virulence genes

Genome comparisons / Clustering & visualisation – Gene-by-gene vs SNP approaches

Special topics – Parasite WGS, EFSA One Health WGS database

Conferences and webinars

Conferences - “Science Meets Policy”

2020: “Modern technologies to enable response to crises: Next Generation Sequencing to tackle food-borne diseases in the EU”

2023: “EU initiatives towards the large-scale use of Next Generation Sequencing (NGS) to tackle foodborne threats”

Webinars

2023: Proficiency Tests on Next Generation Sequencing: approaches in use at the European Union Reference Laboratories

Guidance document updates in the past year

- **Cluster analysis** (curated by EURL *Campylobacter*)

The document was revised at the turn of the year to reflect current technologies, update references, and improve clarity of writing

- **Inventory of training supports for NGS** (curated by EURL *CPS*)

The document was revised at the turn of the year with additional available training modules

- **Reference WGS collection** (curated by EURL *Salmonella*)

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The document was updated recently with new reference data, including PT38 data for *Campylobacter* and additional data for *S. aureus* and *Salmonella*

Upcoming guidance documents

- **Recommendations for quality control parameters in short-reads WGS of foodborne bacteria.** (curated by EURL *Listeria*)

A draft document is currently being prepared, consisting of two parts: The first outlines general requirements, and the second contains pathogen-specific tables detailing the parameters currently used for each pathogen.

- **Protocol on NGS for viruses** (curated by EURL *Foodborne viruses*)

- **Requirements for accreditation of WGS**

A document is being prepared, covering the validation of both wet-lab and dry-lab procedures, with particular emphasis on the latter.

Strain => raw data (FASTQ) => assembly => EFSA compatible cgMLST profiles

Other activities

- Joint training course

*An evaluation of the course format is underway.
...Surveys will be performed.*

- Conferences –

*A new edition of the Science Meets Policy conference discussed.
...At earliest 2027*

- Webinars -

*Activities of the WG on QC and accreditation requirements.
...After guidance documents on accreditation has been released*

Release of data and WGS pipelines

Planned for public release (by the end of the year):

- Datasets to support the validation of bioinformatic pipelines for WGS analysis of *Campylobacter*
- The EURL *Campylobacter* WGS analysis pipeline

Thanks for listening!

Questions welcome!