

The training program of the EURL for *E. coli* 2022-2023



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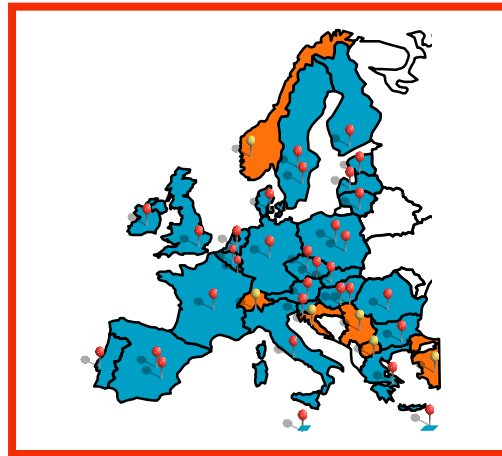


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Training activities of the EURL for *E. coli* in 2023

- Training course on characterization of pathogenic *E. coli* through NGS (two-days)
- STEC detection in food matrices based on the ISO TS 13136:2012 (five days stage)
- Identification and characterization of the different groups of pathogenic *E. coli* (four days stage)

The call was launched at the beginning of 2023, with the deadline for responding in mid-February

NRLs were informed that, in addition to the satisfaction survey, a final questionnaire for evaluating the achievement of the training objectives would be administered to participants

Training course on characterization of pathogenic *E. coli* through NGS (two-days)

This course was held online in the days 11-12 July 2023

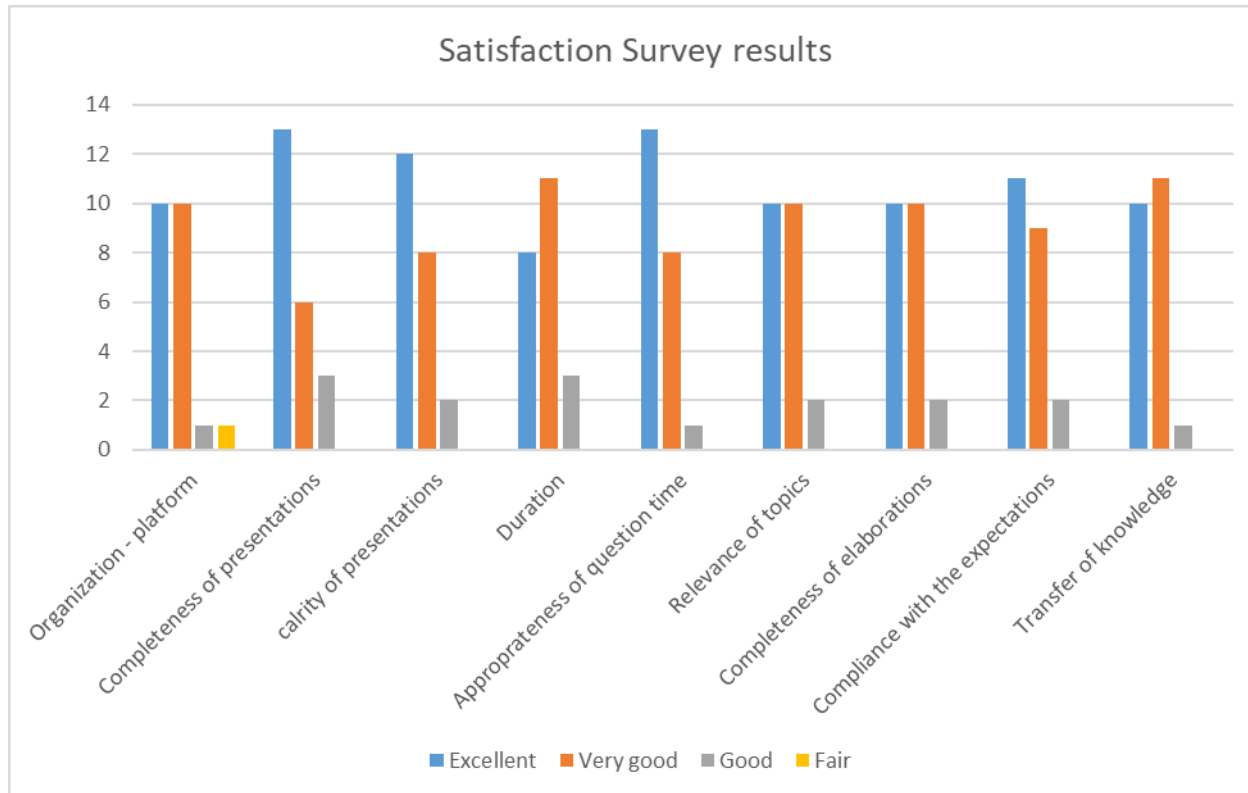
Presentations from EURL for *E. coli* staff

Assignments of exercises

Live-chat to provide assistance

22 participants – 16 from EU and non-EU NRLs and 6 from Italian OLs

86,4% of participants successfully met the training objectives reaching >80% compliance assessed through a dedicated questionnaire



Starting from 2022...

Scientists for training programs on laboratory procedures have been hosted in person at ISS 😊



Training on the Identification and characterization of the different groups of pathogenic *E. coli* 17-21 April 2023



EU Reference Laboratory for *E. coli*
Department of Food Safety, Nutrition and Veterinary Public Health
Unit of Food Microbiology and Foodborne Diseases
Istituto Superiore di Sanità



Program for a 4-days training at the EURL-VTEC, Istituto Superiore di Sanità, Rome, on the identification and characterization of the different groups of pathogenic *E. coli* by Real Time PCR amplification of their virulence genes

Two scientists from EU NRLs participated

Day 1 (14:30-17:30)

- Overview of the activities and procedures in place at the EURL.
- Opening discussion on the work-plan and overview of the activities to be done during the stage.
- Preparation of the cultures of test and control strains.

Day 2 (9:30-17:30)

- Preparation of DNA samples for Real Time PCR from test and control strains.
- Real Time PCR for the identification of the *E. coli* pathogroups STEC and EAEC.

Day 3 (9:30-17:30)

- Real Time PCR for the identification of the *E. coli* pathogroups EIEC and ETEC.
- DNA template preparation for the identification of *stx* gene subtypes by conventional PCR.
- *stx*-subtyping by conventional PCR (EU-RL VTEC_Method_006_Rev 1).

Day 4 (9:30-17:30)

- Agarose gel electrophoresis to visualise the *stx*-subtyping PCR results.
- Analysis of the results obtained.
- General discussion on the activities carried out.
- Questionnaire on the trainee satisfaction toward the stage

All the three days include explanatory discussions driven by the EURL-VTEC experts and practical sessions carried out by the trainee with an hands-on approach, under the supervision of the EURL-VTEC staff.



Both participants successfully met the training objectives

Training on STEC detection in food matrices based on the ISO TS 13136:2012

6-10 November 2023
13-17 November 2023

Hands-on



Program for a 5-days training at the EU-RL VTEC, Istituto Superiore di Sanità, Rome, on the detection of STEC in food matrices according to the ISO TS 13136:2012 and the characterization of the isolated STEC strains

Day 1 (14:30-17:30)

- Overview on the activities and procedures of the EURL.
- Opening discussion on the work-plan and overview on the activities to be done during the stage.
- Enrichment of food samples according to the ISO TS 13136:2012
- Introduction to the EURL Laboratory procedure for STEC O104 identification

Day 2 (9:30-17:30)

- DNA purification from food enrichment cultures.
- Real Time PCR for VTEC identification according to the ISO TS 13136:2012
- Real Time PCR for O104 identification
- Isolation of STEC from Real Time PCR-positive food enrichment cultures: streaking the plates

Day 3 (9:30-16:30)

- Picking up and pooling of colonies and backup onto solid media (nutrient agar)
- Confirmation of suspected colonies as STEC by conventional PCR (Annex C of the ISO TS 13136:2012)

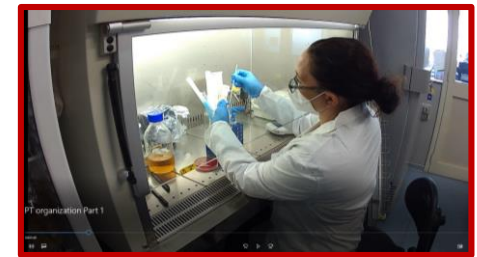
Day 4 (9:30-17:30)

- Molecular serogrouping by conventional PCR (EU-RLVTEC_Method_003_Rev1 25/03/2014)
- Identification of STEC subtypes by conventional PCR (EU-RL VTEC_Method_006_Rev 1 18/06/2013)

Day 5 (9:30-13:30)

- Agarose gel electrophoresis to visualise the STEC subtyping PCR results
- Analysis of the results obtained
- General discussion on the activities carried out
- Questionnaire on the trainee satisfaction toward the stage

All the five days include explanatory discussions driven by the EURL-VTEC experts and practical sessions carried out by the trainee with hands on approach, under the supervision of the EURL-VTEC staff.



Seven scientists will
be attending

2nd joint training – June 20th-21st 2023 RIVM

Introduction to Bioinformatics for genomic data mining

TUESDAY 20 JUNE 2023

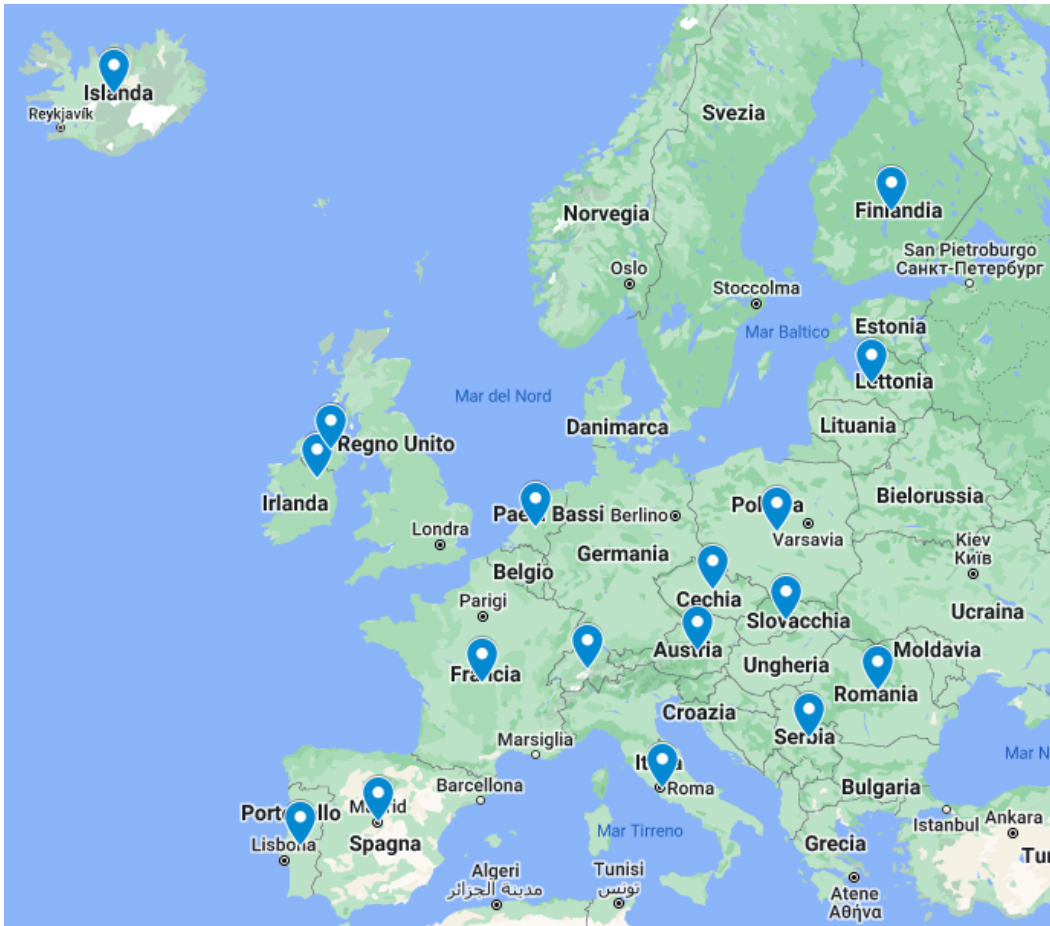
- 9.15 **Registration (for entering the premises of RIVM)**
- 9.45 Welcome and general overview on the joint training activities (Wilma Jacobs, EURL-*Salmonella*)
- 10.00 Introduction to WGS
1. Sequencing platforms & output data (20') (Adrien Asséré, EURL-*Listeria monocytogenes*)
 2. Verification of the integrity of the raw data files (like md5sum) (20') (Angela van Hoek, EURL-*Salmonella*)
 3. Bioinformatics analysis of NGS data: approaches and opportunities (command-line tools, commercial software, web servers) (20') (Joakim Skarin, EURL-Viruses)
- 11.00 **Coffee break**
- 11.20 Introduction on quality check and trimming (Valeria Michelacci, EURL-VTEC)
- 11.40 **Hands-on exercises – Quality check and trimming**
Quality check and trimming using different tools and platforms. Results interpretation.
FastQC and Positional and Quality Trimming on ARIES (Valeria Michelacci, EURL-VTEC)
Quality check and trimming with Seqsphere (Bo Segerman, EURL-Campylobacter)
- 12.45 **Lunch break**
- 13.45 Introduction on assembly and assembly statistics (Lauge Holm Sørensen, EURL-AMR)
- 14.00 **Hands-on exercises – Assembly statistics**
Assembly statistics using different tools and platforms. Results interpretation.
Hands-on SPAdes and Quast from ARIES (Federica Gigliucci, EURL-VTEC)
Demo: Seqsphere Assembly Quality Check (Angela van Hoek, EURL-Salmonella)
- 15.00 From BAM to BCF and beyond, making sense of aligned data (Paolo Vatta, EURL-Parasites)
- 15.30 **Hands-on exercises – Mapping approach**
Demonstration of mapping through different platforms.
Hands-on E. coli virulotyping using a mapping approach (Federica Gigliucci, EURL-VTEC)
Demo: Mapping with Seqsphere (Déborah Merda, EURL-Listeria monocytogenes)

WEDNESDAY 21 JUNE 2023

- 8.45 **Registration (for entering the premises of RIVM)**
- 9.15 Introduction to gene detection using BLAST approach (Marina Cavaiuolo, EURL-CPS)
- 9.30 **Hands-on exercises – Search of genetic features on contigs**
Identification of virulence and AMR genes using different tools and platforms. Results interpretation.
Demonstration of genes identification on contigs through different platforms.
Hands-on ResFinder on CGE webserver (Lauge Holm Sørensen, EURL-AMR)
Demo: Salmonella virulotyping with Seqsphere (Angela van Hoek, EURL-Salmonella)
- 10.15 Parasites WGS: opportunities and challenges (Simone Cacciò, EURL-Parasites)
- 10.45 **Coffee break**
- 11.00 Introduction to genome comparisons: gene-by-gene VS SNPs ([Guidance document for cluster analysis](#)) (Bo Segerman, EURL-Campylobacter)
- 11.30 Demonstration of gene-by-gene approach through different platforms:
ARIES (EURL-VTEC)
Seqsphere (Angela van Hoek, EURL-Salmonella)
Starflow (Déborah Merda, EURL-*Listeria monocytogenes* and Marina Cavaiuolo, EURL-CPS)
- 12.15 **Hands-on exercises – Visualisation of clustering data**
Demonstration via Grapetree (Déborah Merda, EURL-*Listeria monocytogenes*)
- 12:45 **Lunch break**
- 13.45 Update on the EFSA OneHealth WGS database (Mirko Rossi, EFSA)
- 14:15 Information on activities of inter EURLs Working Group on NGS and guidance documents released (Valeria Michelacci, EURL-VTEC)
- 14:45 Wrap up (Wilma Jacobs-Reitsma, EURL-*Salmonella*)
- 15.00 **Closure**



Participants – geographic distribution



24 participants from different NRLs
4 at own costs
2 supported by EURL VTEC

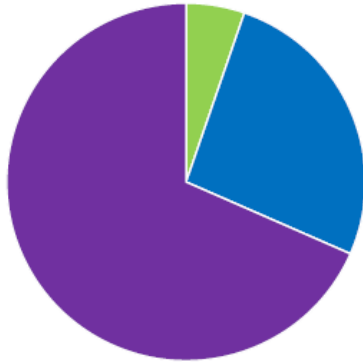
17 different countries
(13 Member States + 2 EFTA/EEA +
Northern Ireland + 1 Candidate
Country)

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

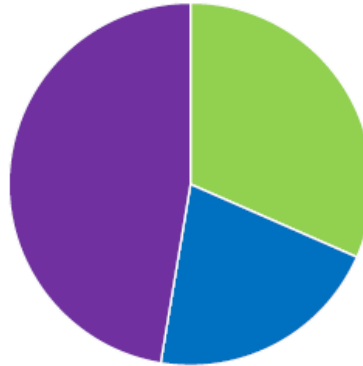
2023 - Training satisfaction survey

■ Poor ■ Fair ■ Good ■ Very good ■ Excellent

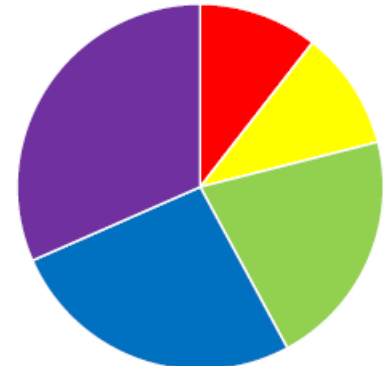
Relevance topics



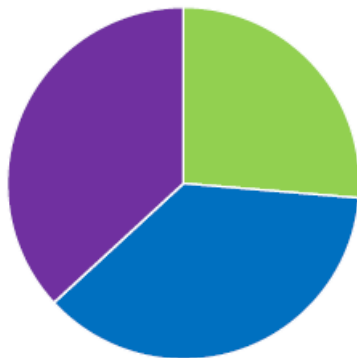
Completeness presentations



ratio theory - 'Hands-on exercises'



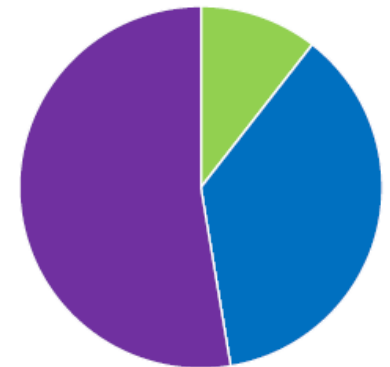
Possibilities and time for raising questions



Complying with expectations



Applicability



Thank you for your
attention!