

# Update from the Inter EURL working group on NGS

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# EURLs WORKING GROUP ON NGS

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## 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

## MEMBERSHIP:

EURL *E. coli* (coordinator)  
EURL *Listeria monocytogenes*  
EURL CPS  
EURL *Salmonella*  
EURL *Campylobacter*  
EURL Parasites  
EURL AR  
EURL Foodborne viruses  
Observers: SANTE G4, EFSA, ECDC

from  
November 2017

Meeting twice a year  
(8 meetings done)



# Inter EURLs WG webpages

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- EURL *E. coli*:

[https://www.iss.it/e.-coli-genomics/-/asset\\_publisher/JfoC50PmadD7/content/inter-eurl-wg-on-ngs](https://www.iss.it/e.-coli-genomics/-/asset_publisher/JfoC50PmadD7/content/inter-eurl-wg-on-ngs)

- EURL *Salmonella*:

<https://www.eurlsalmonella.eu/publications/eurl-manual> - Next Generation Sequencing section

- EURL *Campylobacter*:

<https://www.sva.se/en/about-us/eurl-campylobacter/laboratory-procedures/inter-eurls-working-group-on-ngs/>

- EURL AMR:

<https://www.eurl-ar.eu/inter-eurls-working-group-on-ngs.aspx>

- EURL *Listeria*:

<https://sitesv2.anses.fr/en/minisite/listeria-monocytogenes/inter-eurls-working-group-ngs>

- EURL Coagulase Positive *Staphylococci*:

<https://sitesv2.anses.fr/en/minisite/staphylococci/inter-eurls-working-group-ngs>

# Documents produced

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1. Overview of conducted **PTs** curated by EURL AR → Position paper
2. Reference **WGS collection** curated by EURL Salmonella → To be expanded
3. **NGS laboratory procedures** curated by EURL Parasites
4. **Bioinformatics tools for basic analysis of NGS data** curated by EURL VTEC → To be updated
5. **Guidance document for WGS - cluster analysis** curated by EURL Campylobacter → To be expanded
6. **Guidance document for NGS benchmarking** curated by EURL Listeria
7. **Inventory of training supports** curated by EURL CPS → To be updated
8. **Survey on the use of NGS across the NRLs networks** curated by EURL VTEC → Follow up: updated capacity?

# Reference WGS collections

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Currently including:

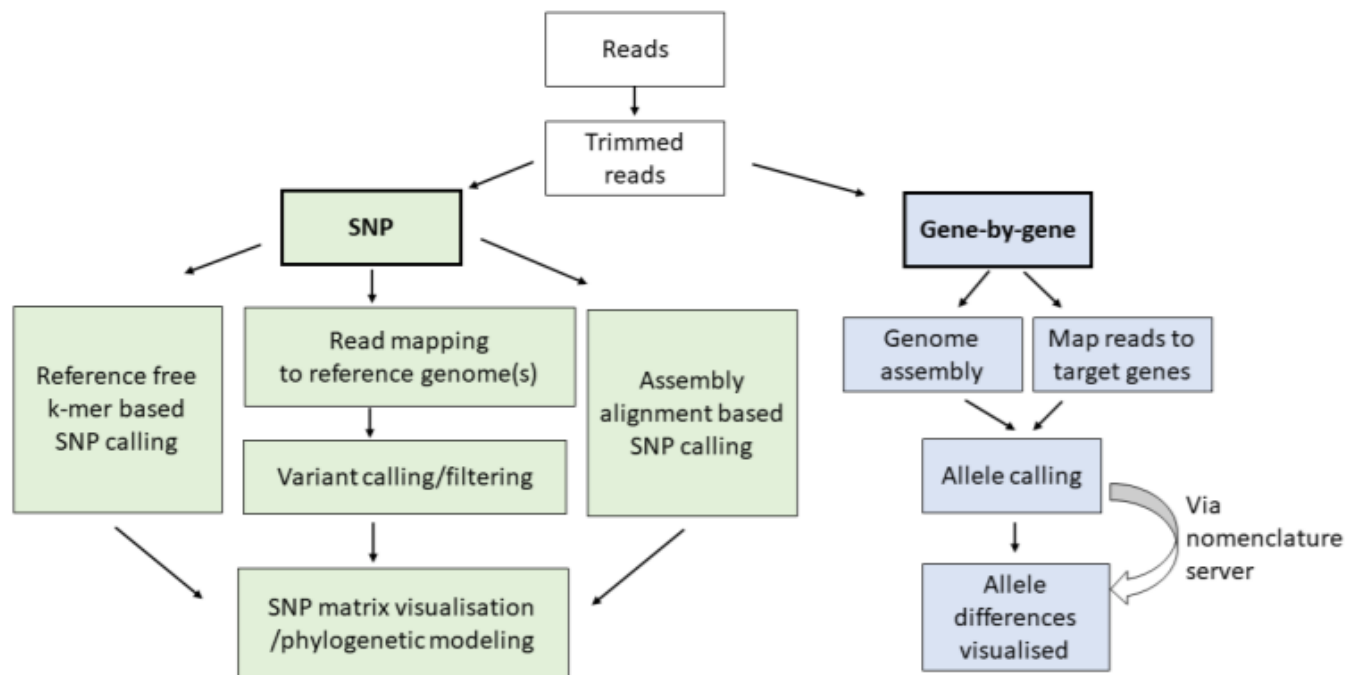
- Multiple sequences of the same six **O26 STEC strains** obtained during the 1<sup>st</sup> PT on WGS (anonymzed)
- Multiple sequences of the same six ***Salmonella Typhimurium*** strains obtained during PTs organized by EURL Salmonella (anonymzed)
- Multiple sequences of the one ***Campylobacter jejuni*** and one ***Campylobacter coli*** strains obtained during PTs organized by EURL Campylobacter (anonymzed)

Sequences available upon direct request at the indicated email addresses

**for *E. coli* you may contact**  
**[crl.vtec@iss.it](mailto:crl.vtec@iss.it)**



# Guidance for cluster analysis – curated by EURL Campy



List of tools and pipelines for the different approaches for cluster analysis

It is going to be updated with more info on visualization tools and more interpretation guidelines

**“Science meets Policy” conference:  
Modern technologies to enable response to crises:  
Next Generation Sequencing to tackle food-borne  
diseases in the EU**

**Organised by**

**Inter-EURLs Working group on Next Generation  
Sequencing**

**September 25<sup>th</sup> 2020 - online**

# Science meets policy Conference - Sept 25th 2020

## Agenda

### Friday 25 September

09:30	Welcome and Introduction	Silvio Brusaferrò ISS President
09:45	Greetings and event outline	Stefano Morabito Chair of the organization committee, EURL for E. coli, ISS, Rome Italy

### Morning Session: Building the capacity in Europe

10:10	EU food safety policy and NGS	Martial Plantady European Commission G4
10:30	EFSA State of play and future perspectives in the food safety area	Valentina Rizzi European Food Safety Authority
10:50	ECDC State of play and future perspectives in the public health area	Saara Kotila European Centre for Disease Prevention and Control
11:10	Need for a legal framework for NGS data supporting action by the CAs	George Haringhuizen RMM, The Netherlands
11:30	Question time	
12:00	End of Morning Session	

### Afternoon Session: Building the pathway

14:00	The Use of Genomics in One Health AMR Surveillance: The Experience of the US National Antimicrobial Resistance Monitoring System	Patrick McDermott FDA, USA
14:20	Open discussion	Chair: Stefano Morabito Panel: Valentina Rizzi, Saara Kotila, George Haringhuizen, Eelco Franz, Annemarie Kaesbohrer, Martial Plantady
16:30	Concluding remarks and closure	



# Geographic coverage

521 Registered  
49 Countries



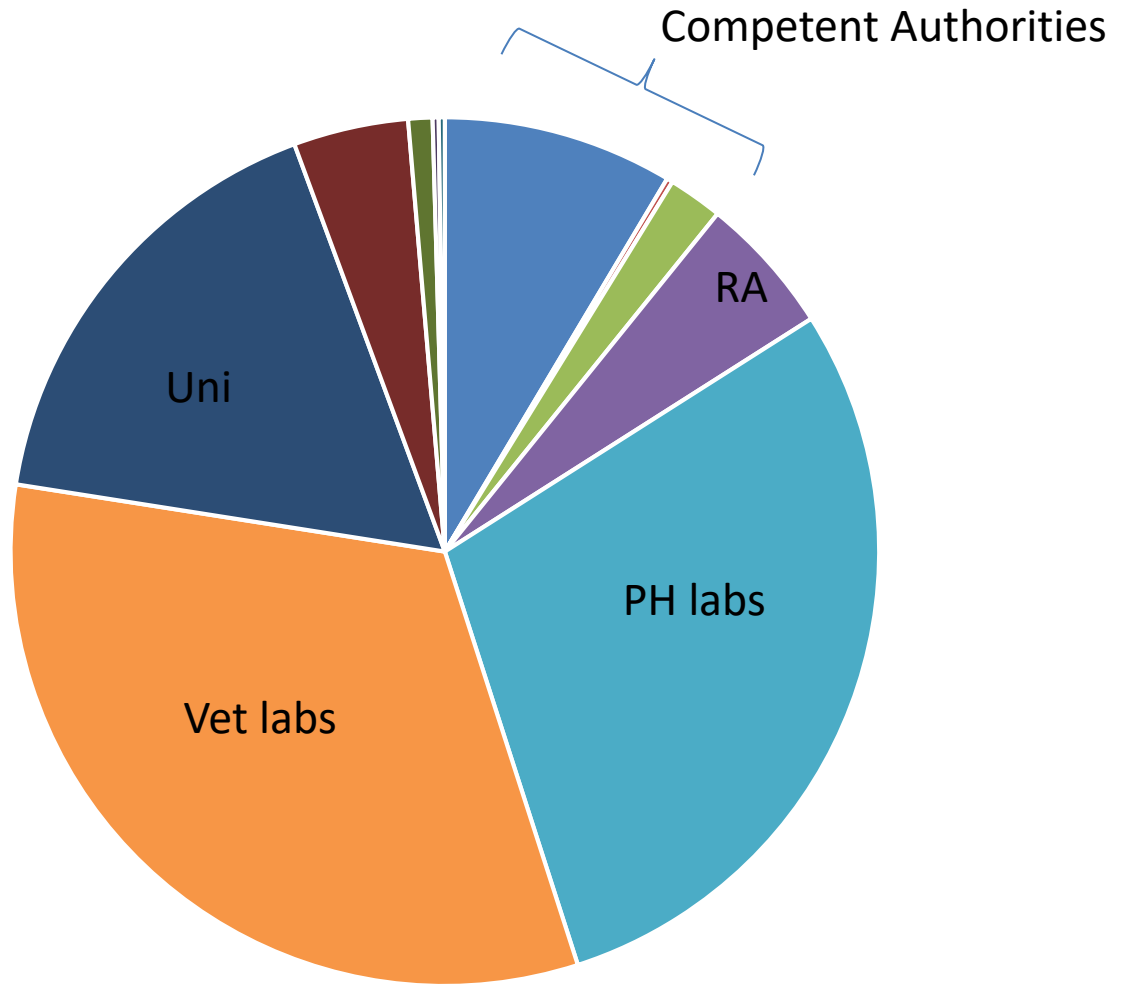
Istituto Superiore di Sanità, Dept. Food Safety, Nutrition and Veterinary Public Health  
European Union and National Reference Laboratory for *E. coli*, Rome, Italy



# Institutional coverage

- 144 Vet labs
- 129 Public health Labs
- 75 Universities
- 38 Ministry Agriculture
- 23 Risk assessment Institutes
- 19 International Agencies
- 9 Ministry Health
- 4 Food industries
- 1 Ministry Environment
- 1 Lowyer
- 1 Press

*444/521 traced to corresponding institution*



# Key messages

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- NGS is perceived as the election technology for typing food-borne pathogens
- There are hindrances to the large scale adoption in the EU
- *capacity* (Inter EURLs Working Group could work on this)
- Lack of resources (Sequencing services?)
- Legal framework is uncertain
- Afraid of data sharing

**Next edition:  
in person - tentatively in 2022**



# Joint training – 2020 edition - postponed

## Joint activities on Bioinformatics for Whole Genome Sequencing data management and analysis

Originally scheduled for July 2020  
Postponed – tentatively in person in 2022

- EURL *E. coli*
- EURL *Listeria monocytogenes*
- EURL *Salmonella*
- EURL CPS *NEW!*
- EURL Parasites *NEW!*
- EURL Foodborne viruses *NEW!*

### DRAFT AGENDA

#### Day 1

- 9.00 **Registration**
- 9.15 Welcome and general overview on the joint training activities (S. Morabito)
- 9.30 Introduction to WGS
  1. Sequencing platform & output data
  2. Quality check and basic analytical tools
  3. Molecular typing by WGS
- 11.00 **Coffee break**
- 11.30 Bioinformatics analysis of NGS data: approaches and opportunities
- 11.45 Introduction on quality check and trimming
- 12.15 **Hands on exercises – Quality check and trimming**  
Use of different platforms for quality check and trimming
- 13.00 **LUNCH**
- 14.00 Introduction on assembly and assembly statistics
- 14.30 **Hands on exercises – Assembly and assembly statistics**  
Use of different platforms for assembly and assembly statistics

- 15.15 Introduction on approaches for searching genetic features
- 15.45 **Hands on exercises – Mapping approach**  
Use of different platforms for mapping seq data onto reference sequences
- 16.30 **Hands on exercises – Blast search of genetic features**  
Use of different platforms for BLAST searches
- 17.30 End of the first day**
- 19.00 Optionally, a group dinner will be organized (Supported by home institutions)
- #### Day 2
- 9.00 Introduction on approaches for annotation of genetic features
- 9.15 **Hands on exercises – Annotation of genetic features**  
Use of different platforms for annotating genes & genomes
- 10.00 Introduction to genome comparisons gene-by-gene VS SNPs
- 10.45 Genome comparisons: Hints and tools from different platforms
- 12:20 Wrap up: strategies and opportunities for WGS analysis applied to food-borne threats
- 13.00 **Closure**



# Inter-EURLs Working Group on NGS (NEXT GENERATION SEQUENCING)



*Thank you for your attention!*