



# Phylogenetic reconstruction and outbreak investigation using IRIDA and SNVPhyl

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Public Health Agency of Canada

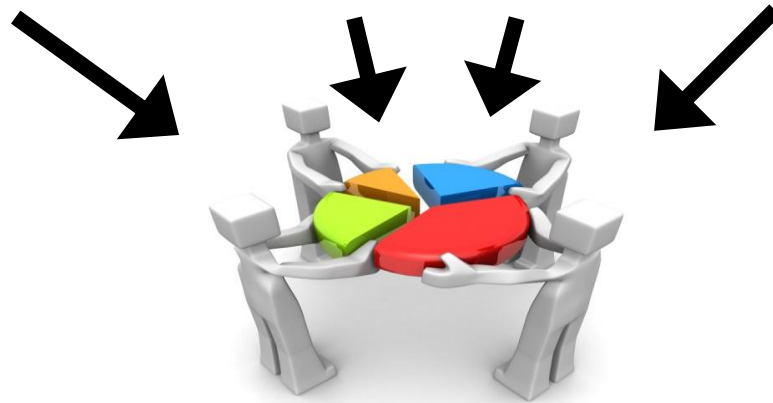
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**Integrated Rapid Infectious Disease Analysis informatics platform**  
supporting real-time infectious disease outbreak investigations

Genomics, Epidemiology, Clinical, Lab Data



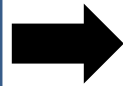
*Vision: Open source, standards compliant, enabling rich genomic epi analysis for public health agencies, plus supporting rapid, open genome data release, interacting with, complementing other resources*

# SNVPhyl

Single Nucleotide Variant PHYlogenomics



Reference  
Mapping



Variant  
Identification  
& Filtering



Phylogeny  
Generation

- Implemented in Galaxy
  - Web interface, API, provenance
- QA/QC reports
- Re-labeling of tree

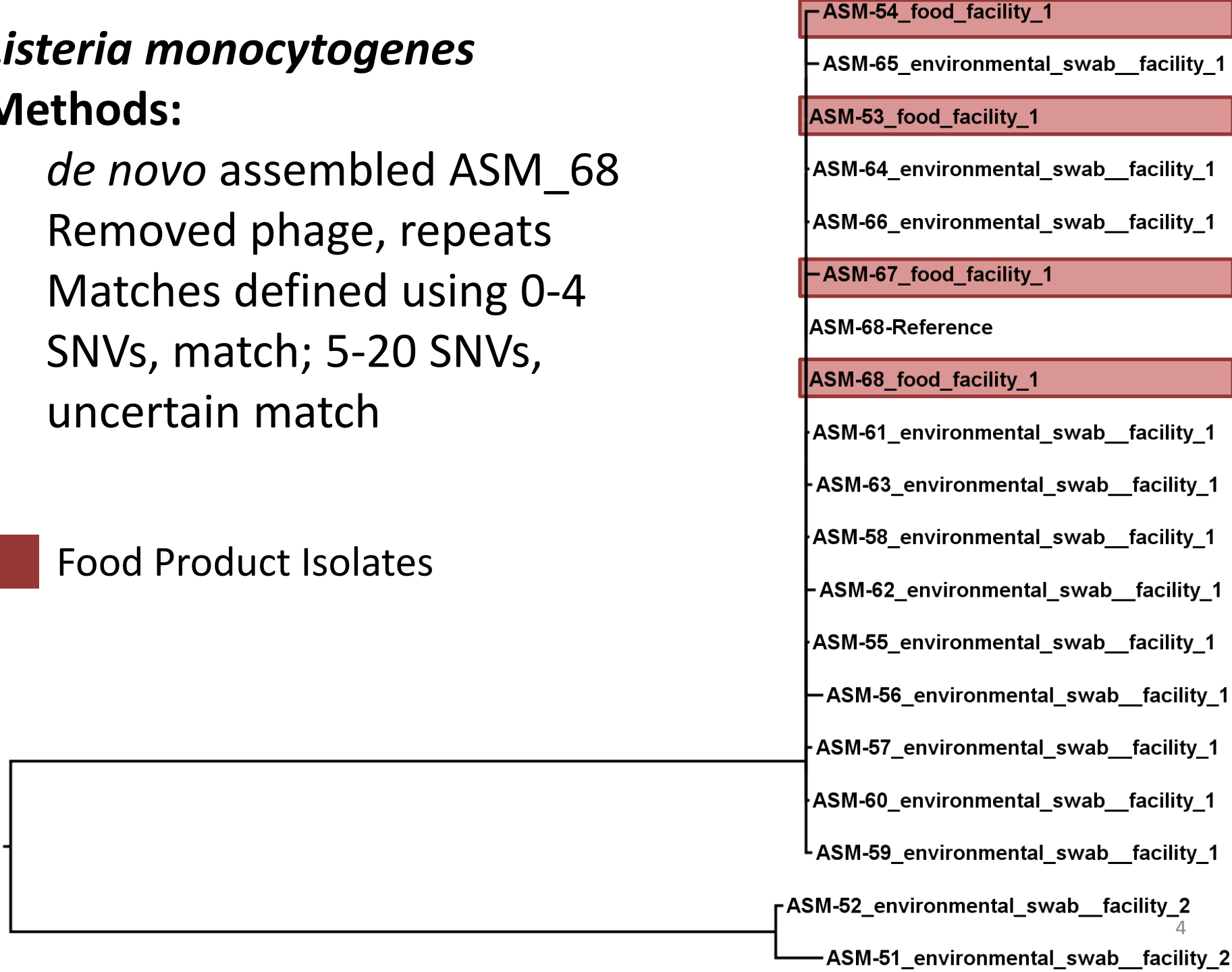


# Listeria monocytogenes

## Methods:

- *de novo* assembled ASM\_68
- Removed phage, repeats
- Matches defined using 0-4 SNVs, match; 5-20 SNVs, uncertain match

 Food Product Isolates

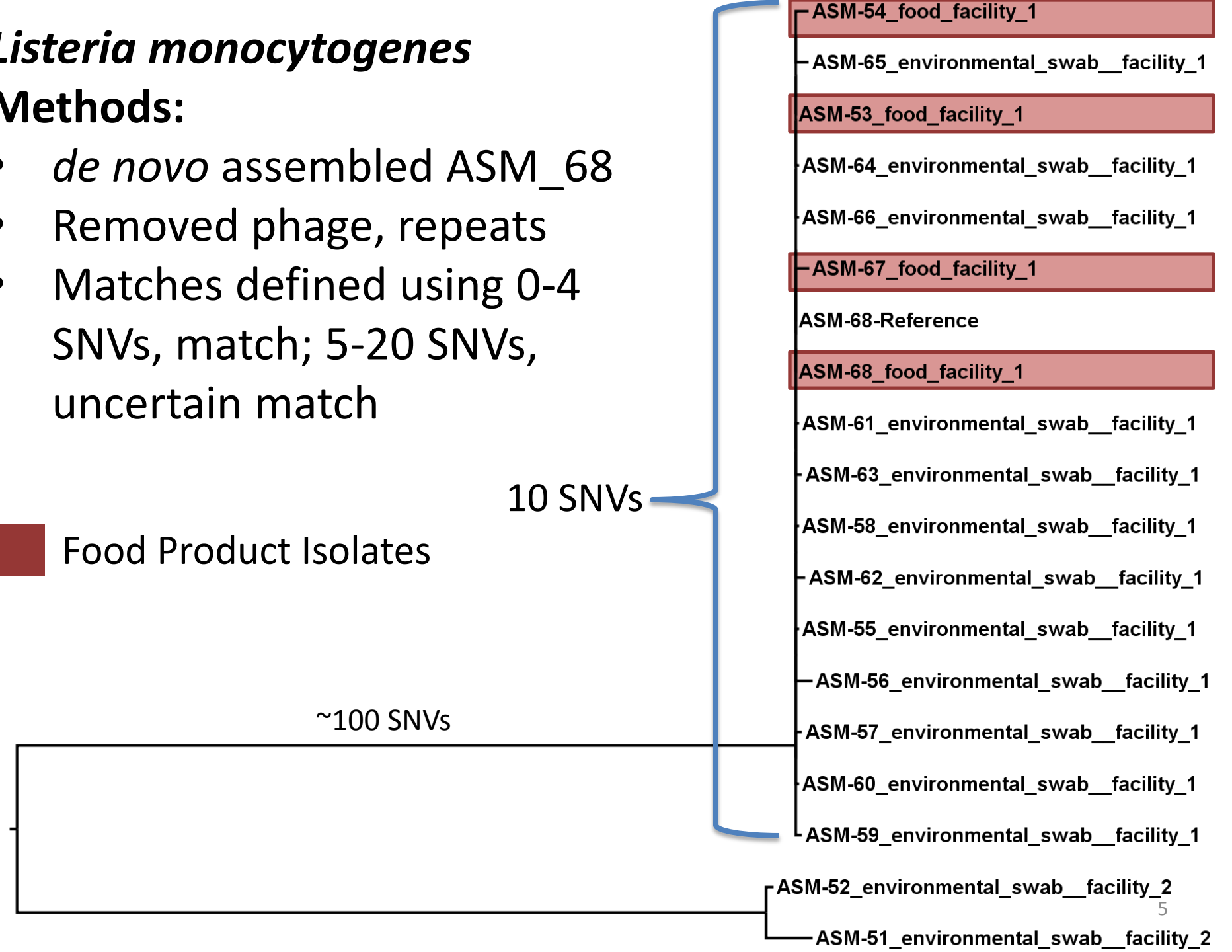


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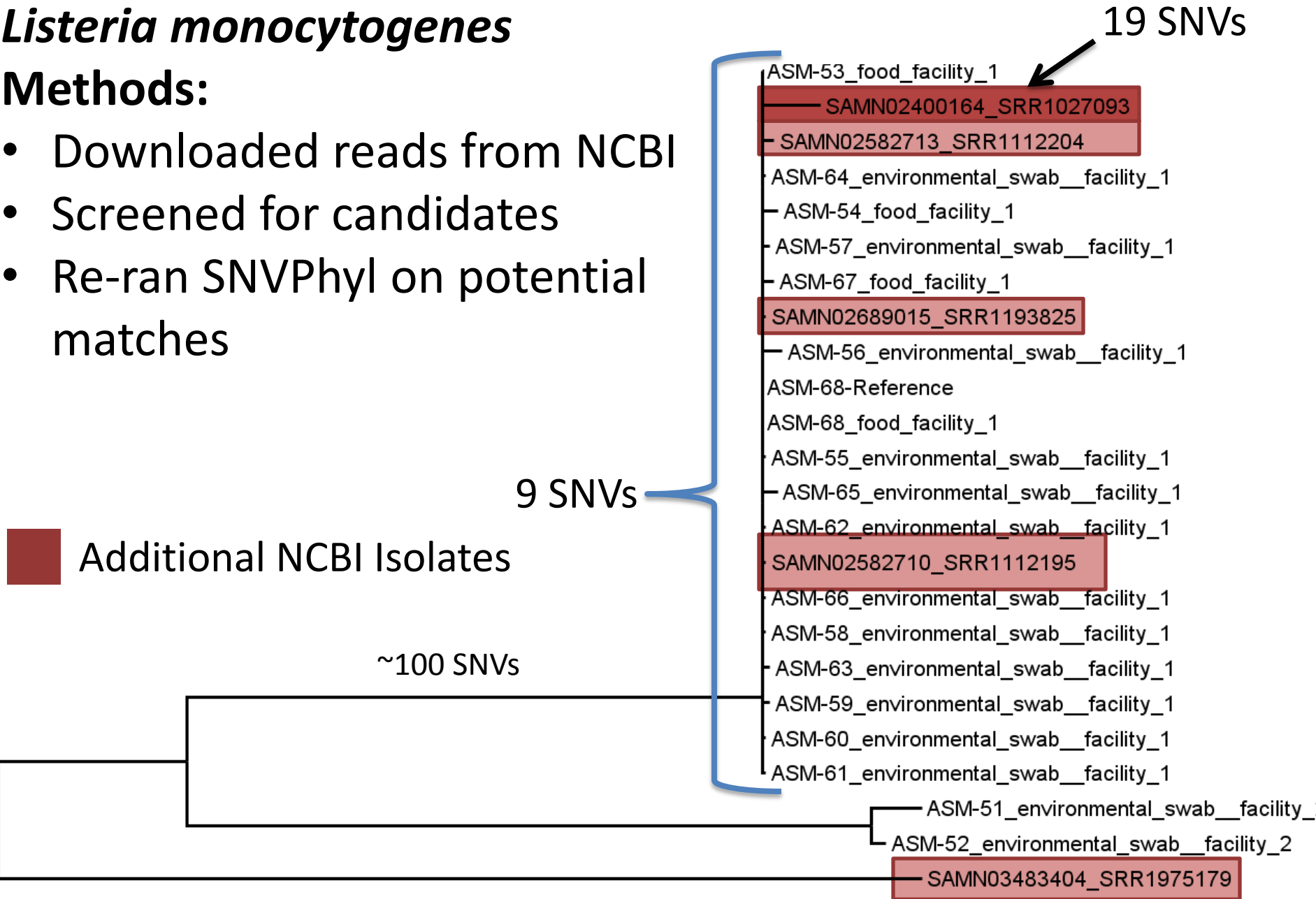


# Listeria monocytogenes

## Methods:

- Downloaded reads from NCBI
- Screened for candidates
- Re-ran SNVPhyl on potential matches

Additional NCBI Isolates

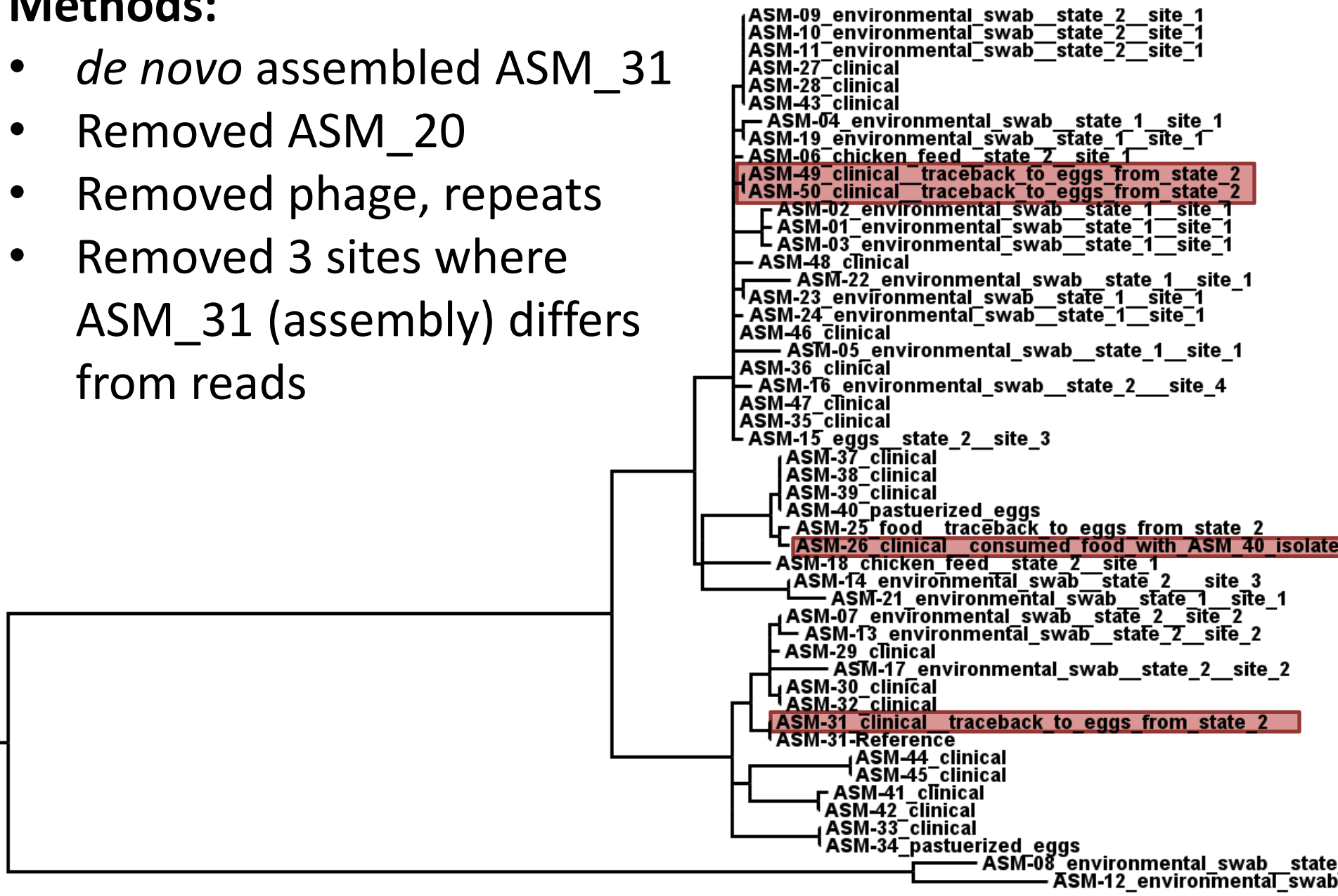




# Salmonella Enteritidis

## Methods:

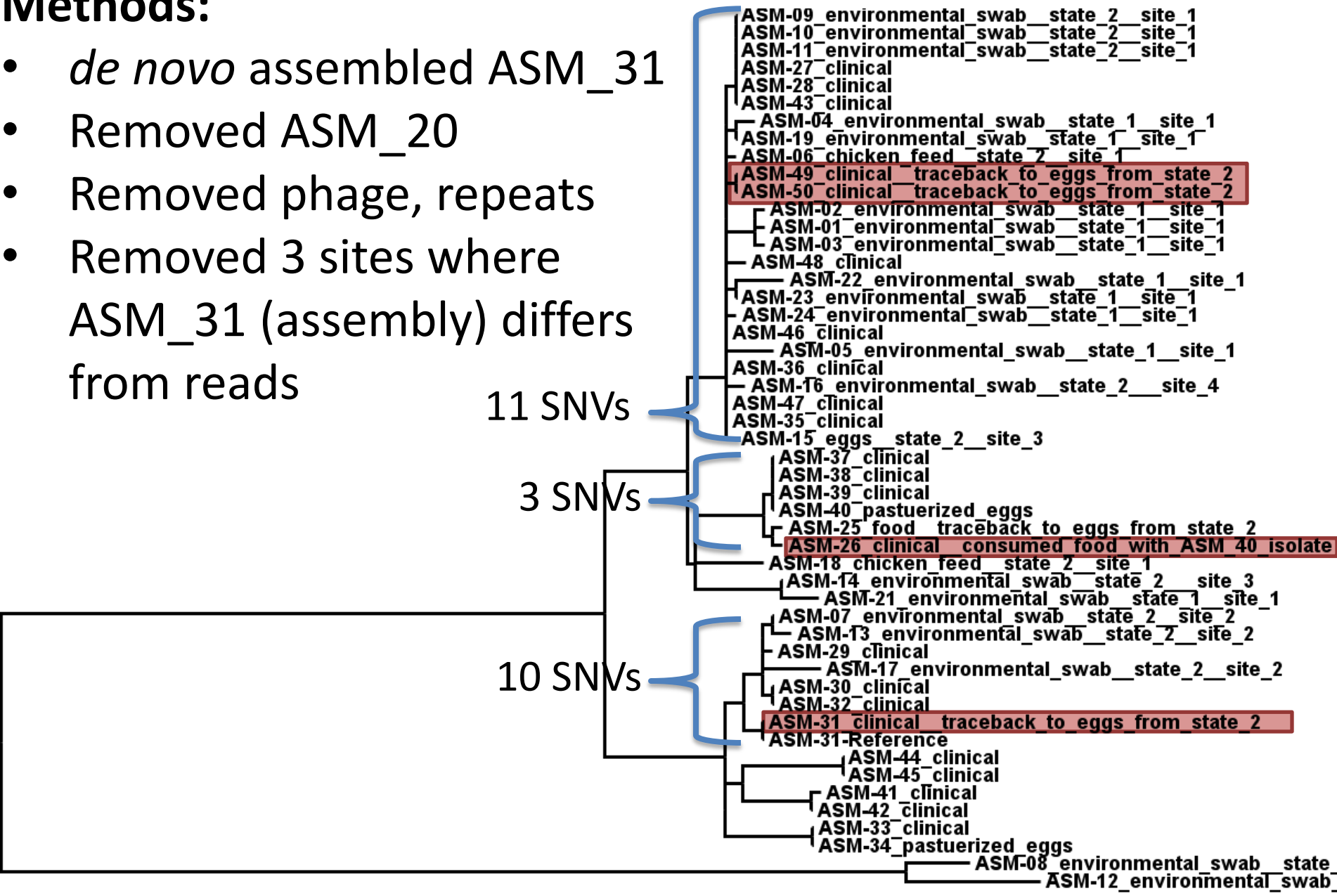
- *de novo* assembled ASM\_31
- Removed ASM\_20
- Removed phage, repeats
- Removed 3 sites where ASM\_31 (assembly) differs from reads



# Salmonella Enteritidis

## Methods:

- *de novo* assembled ASM\_31
- Removed ASM\_20
- Removed phage, repeats
- Removed 3 sites where ASM\_31 (assembly) differs from reads





# More Information

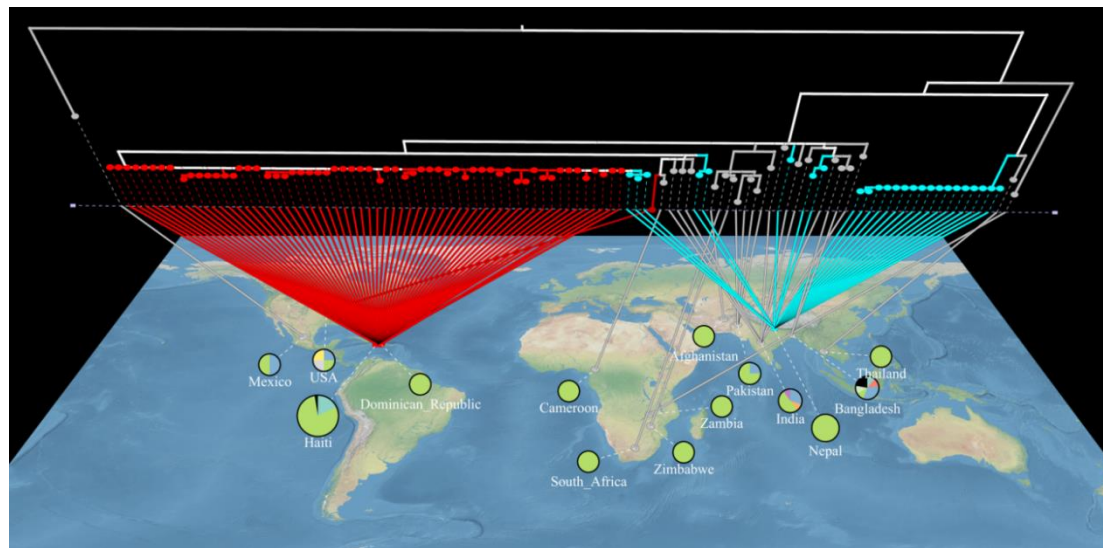
<http://snvphyl.readthedocs.org/>

<http://irida.ca>, posters #7, #8



## Current Interest:

mobile element detection, recombination detection,  
reference selection



Phylogeography: <http://kiwi.cs.dal.ca/GenGIS>

# Acknowledgements

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- IRIDA Team
- Galaxy Team

<http://irida.ca>

<http://snvphyl.readthedocs.org/>



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