# OIE Reference Laboratory Reports Activities

## Activities in 2019

This report has been submitted: 2020-01-14 19:30:13

<table>
<thead>
<tr>
<th><strong>Name of disease (or topic) for which you are a designated OIE Reference Laboratory:</strong></th>
<th>Escherichia coli</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Address of laboratory:</strong></td>
<td>3200 Sicotte Saint-Hyacinthe Québec J2S 2M2 CANADA</td>
</tr>
<tr>
<td><strong>Tel.:</strong></td>
<td>+1-450 773.85.21</td>
</tr>
<tr>
<td><strong>Fax:</strong></td>
<td>+1-450 778.81.08</td>
</tr>
<tr>
<td><strong>E-mail address:</strong></td>
<td><a href="mailto:john.morris.fairbrother@umontreal.ca">john.morris.fairbrother@umontreal.ca</a></td>
</tr>
<tr>
<td><strong>Website:</strong></td>
<td><a href="http://www.ecl-lab.ca">www.ecl-lab.ca</a>; <a href="http://www.apzec.ca">www.apzec.ca</a></td>
</tr>
<tr>
<td><strong>Name (including Title) of Head of Laboratory (Responsible Official):</strong></td>
<td>John Morris Fairbrother, BVsc, PhD, Professor</td>
</tr>
<tr>
<td><strong>Name (including Title and Position) of OIE Reference Expert:</strong></td>
<td>John Morris Fairbrother, BVsc, PhD, Professor</td>
</tr>
<tr>
<td><strong>Which of the following defines your laboratory? Check all that apply:</strong></td>
<td>Academic</td>
</tr>
</tbody>
</table>
ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

<table>
<thead>
<tr>
<th>Diagnostic Test</th>
<th>Indicated in OIE Manual (Yes/No)</th>
<th>Total number of test performed last year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nationally</td>
<td>Internationally</td>
</tr>
<tr>
<td>Indirect diagnostic tests</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slide agglutination for E. coli O serotyping</td>
<td>Yes</td>
<td>16</td>
</tr>
<tr>
<td>Conventional PCR for pathogenic E. coli (up to 10 virulence genes)</td>
<td>Yes</td>
<td>11590</td>
</tr>
<tr>
<td>Antimicrobial resistance by minimal inhibition concentration, disk diffusion, PCR or gene sequencing</td>
<td>Yes</td>
<td>15</td>
</tr>
<tr>
<td>Whole genome sequencing</td>
<td>Yes</td>
<td>240</td>
</tr>
</tbody>
</table>

ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards. To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by the OIE?

No

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

Yes
<table>
<thead>
<tr>
<th>Type of reagent available</th>
<th>Related diagnostic test</th>
<th>Produced/provided</th>
<th>Amount supplied nationally (ml, mg)</th>
<th>Amount supplied internationally (ml, mg)</th>
<th>No. of recipient OIE Member Countries</th>
<th>Region of recipients</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. coli reference strains</td>
<td>Conventional PCR for pathogenic E. coli</td>
<td>produced and provided</td>
<td>16 strains</td>
<td>13 strains</td>
<td>3</td>
<td>□ Africa □ Americas □ Asia and Pacific □ Europe □ Middle East</td>
</tr>
<tr>
<td>F4 (K88) antiserum</td>
<td>Slide agglutination E. coli O serotyping</td>
<td>produced and provided</td>
<td>93 ml</td>
<td>0 ml</td>
<td>1</td>
<td>□ Africa □ Americas □ Asia and Pacific □ Europe □ Middle East</td>
</tr>
<tr>
<td>F5 (K99) antiserum</td>
<td>Slide agglutination E. coli O serotyping</td>
<td>produced and provided</td>
<td>75 ml</td>
<td>0 ml</td>
<td>1</td>
<td>□ Africa □ Americas □ Asia and Pacific □ Europe □ Middle East</td>
</tr>
</tbody>
</table>

4. Did your laboratory produce vaccines?
No

5. Did your laboratory supply vaccines to OIE Member Countries?
No

ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?
Yes

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?
<table>
<thead>
<tr>
<th>Name of the new test or diagnostic method or vaccine developed</th>
<th>Description and References (Publication, website, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole genome sequencing (WGS) of E. coli isolates</td>
<td>We are offering WGS testing of E. coli isolates for serotyping, MLST and detection of virulence and antimicrobial resistance genes using Illumina Nextera XT or Nextera Flex preparation kits and an Illumina Miseq sequencing platform and in silico analysis.</td>
</tr>
</tbody>
</table>

**ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries**

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

No

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

No

**ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations**

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes
<table>
<thead>
<tr>
<th>Title of the study</th>
<th>Duration</th>
<th>Purpose of the study</th>
<th>Partners (Institutions)</th>
<th>OIE Member Countries involved other than your country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of potentially pathogenic E. coli and their antimicrobial resistance from chickens on farm and at slaughter in Senegal</td>
<td>3 years</td>
<td>Characterization of virotype, serotype, antimicrobial resistance of E. coli isolates</td>
<td>École Inter-États des Sciences et Médecine Vétérinaires (EISMV), Sénégal</td>
<td>SENEGAL</td>
</tr>
<tr>
<td>Study of the prevalence of bioresistances in the equine healthy population in France. (Antimicrobial resistance in Enterobacteriaceae)</td>
<td>2 years</td>
<td>To study the epidemiology of antimicrobial resistance in the healthy equine population in France, and to characterize the commensal E. coli producing BLSE/AmpC in this population.</td>
<td>INRA Tours, France</td>
<td>FRANCE</td>
</tr>
</tbody>
</table>

**ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases**

11. Did your Laboratory collect epizootiological data relevant to international disease control?  
Yes

If the answer is yes, please provide details of the data collected:

We collected data on pathovirotypes and antimicrobial resistance of Escherichia coli in diseased pigs from Québec from January to December 2019.

12. Did your laboratory disseminate epizootiological data that had been processed and analysed?  
Yes

If the answer is yes, please provide details of the data collected:

Four 2019 quarterly reports on surveillance of pathovirotypes and antimicrobial resistance of Escherichia coli in diseased pigs, MAPAQ (Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec), RAIZO (Réseau d’alerte de d’information zoosanitaire) porcin, Québec, Canada, March, June, September, and December 2019 (see answer #11). 2018 annual report on surveillance of pathovirotypes and antimicrobial resistance of Escherichia coli diseased in pigs, MAPAQ (Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec), RAIZO (Réseau d’alerte de d’information zoosanitaire) porcin, Québec, Canada, March 2019 (data from January to December 2018).

13. What method of dissemination of information is most often used by your laboratory?  
(Indicate in the appropriate box the number by category)
a) Articles published in peer-reviewed journals: 10


b) International conferences: 0

c) National conferences: 5


d) Other:
(Provide website address or link to appropriate information) 12

www.ecl-lab.ca/en (Our window for dissemination of information on our OIE related activities.)
www.apzec.ca (Our online database)

https://www.facebook.com/OIE-Reference-Laboratory-for-Escherichia-coli-2300853137006655/

Reports

Four 2019 quarterly reports on surveillance of pathovirotypes and antimicrobial resistance of Escherichia coli in diseased pigs, MAPAQ (Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec), RAIZO (Réseau d’alerte de d’information zoosanitaire) porcin, Québec, Canada, March, June, September, and December 2019.

2018 annual report on surveillance of pathovirotypes and antimicrobial resistance of Escherichia coli in diseased pigs, MAPAQ (Ministère de l’Agriculture, des Pêcheries et de l’Alimentation du Québec), RAIZO (Réseau d’alerte de d’information zoosanitaire) porcin, Québec, Canada, March 2019.

Invited Speaker


Development of a whole genome sequencing approach for identification and antimicrobial resistance of pathogenic Escherichia coli in the veterinary diagnostic laboratory. CALHN meeting, St-Hyacinthe, Québec, Canada, May 27th-29th 2019.

Comment change les résultats d’analyse du génome complet de souches de E. coli dans le temps. Symposium Elanco des pathologies intestinales du porcelet. Drummondville, Québec. Octobre 8th 2019


Emergence d’un clone ETEC:F4 multirésistant dans la population de E. coli pathogènes au Québec, en 2015. Le séquençage du génome complet au service du diagnostic vétérinaire. Prevtec Microbia, St-Hyacinthe, Québec, Canada, October 21st 2019 (Dre Maud de Lagarde).

Développement d’un outil pour le contrôle des E. coli pathogènes et multi-résistants chez le porc et l’aviaire en utilisant le séquençage du génome complet. Prevtec Microbia, St-Hyacinthe, Québec, Canada, October 21st 2019


**ToR 7: To provide scientific and technical training for personnel from OIE Member Countries**

**To recommend the prescribed and alternative tests or vaccines as OIE Standards**

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

Yes

a) Technical visits: 0

b) Seminars: 0

c) Hands-on training courses: 0

d) Internships (>1 month): 2
Type of technical training provided (a, b, c or d) | Country of origin of the expert(s) provided with training | No. participants from the corresponding country
--- | --- | ---
d | France | 1
d | Senegal | 1

**ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned**

15. Does your laboratory have a Quality Management System?

Yes

<table>
<thead>
<tr>
<th>Quality management system adopted</th>
<th>Certificate scan (PDF, JPG, PNG format)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americian Association of Veterinary Laboratory Diagnosticians (AAVLD)</td>
<td>2016 AAVLD Certificate U of Montreal.pdf</td>
</tr>
</tbody>
</table>

16. Is your quality management system accredited?

Yes

<table>
<thead>
<tr>
<th>Test for which your laboratory is accredited</th>
<th>Accreditation body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please, see: <a href="https://aavld.memberclicks.net/accreditation-requirements-page">https://aavld.memberclicks.net/accreditation-requirements-page</a></td>
<td>American Association of Veterinary Laboratory Diagnosticians</td>
</tr>
</tbody>
</table>

17. Does your laboratory maintain a “biorisk management system” for the pathogen and the disease concerned?

Yes

(See Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4)

**ToR 9: To organise and participate in scientific meetings on behalf of the OIE**

18. Did your laboratory organise scientific meetings on behalf of the OIE?

No

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

No
ToR 10: To establish and maintain a network with other OIE Reference Laboratories designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results

20. Did your laboratory exchange information with other OIE Reference Laboratories designated for the same pathogen or disease?

Not applicable (Only OIE Reference Lab. designated for disease)

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

Not applicable (Only OIE Reference Lab. designated for disease)

22. Did your laboratory collaborate with other OIE Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

Not applicable (Only OIE Reference Lab. designated for disease)

ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than OIE Reference Laboratories for the same disease?

Yes

Note: See Interlaboratory test comparisons in: Laboratory Proficiency Testing at: http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing see point 1.3

<table>
<thead>
<tr>
<th>Purpose for inter-laboratory test comparisons¹</th>
<th>No. participating laboratories</th>
<th>Region(s) of participating OIE Member Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th External Quality Assessment Scheme for Shiga toxin-producing Escherichia coli (STEC), 2018-2019 Covering the following: • Serotyping (O group and H type) • Virulence gene determination (aaiC, aggR, eae, stx1, stx2 and subtyping) • Cluster analysis (WGS derived data) Organized by Statens Serum Institut (SSI).</td>
<td>More than 30 countries</td>
<td>□ Africa □ Americas □ Asia and Pacific □ Europe □ Middle East</td>
</tr>
</tbody>
</table>
ToR 12: To place expert consultants at the disposal of the OIE

24. Did your laboratory place expert consultants at the disposal of the OIE?

No

25. Additional comments regarding your report: