



Canadian Food  
Inspection Agency

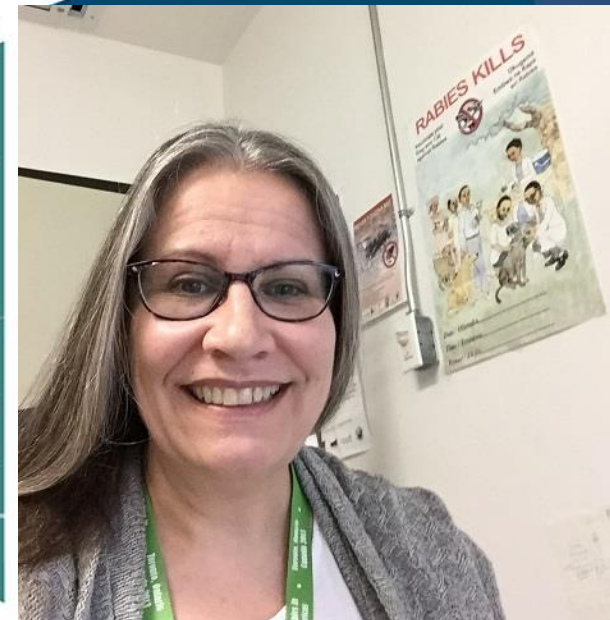
Agence canadienne  
d'inspection des aliments

# WHO/PAHO Collaborating Centre for the Epidemiology and Control of Rabies in Carnivores

Christine Fehlner-Gardiner, PhD

17ª REUNIÓN DE DIRECTORES DE LOS PROGRAMAS DE RABIA DE LAS AMÉRICAS  
Bogotá, Colombia, 12-14 de octubre del 2023

SESIÓN : El papel de los centros colaboradores de la OPS/OMS en rabia en la Región de las Américas



Canada

WHO/PAHO Collaborating Centre for the Epidemiology and Control  
of Rabies in Carnivores

## **Who we are**



# WHO/PAHO Collaborating Centre for the Epidemiology and Control of Rabies in Carnivores

- Canadian Reference Laboratory for Rabies “CFIA Centre of Expertise for Rabies”
- Located at the Canadian Food Inspection Agency Ottawa Laboratory - Fallowfield
- Small team of scientists and technicians
- Biocontainment Level 2 and 3 laboratories and animal facilities
- Accredited to the ISO/IEC 17025 Quality Standard
- WHO/PAHO CC since 1992
- WOAHA Reference Laboratory for Rabies since 1991



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## **What we do**



# CFIA Centre of Expertise for Rabies – Key Activities

## – Diagnosis and Variant identification

- Suspect animals with human or domestic animal contact
- Suspect human cases
- Antigenic and molecular typing of virus

## – Research and technology development

- Virus characterization and phylogenetics
- Methods development
- Oral vaccine research and support of provincial wildlife control programs

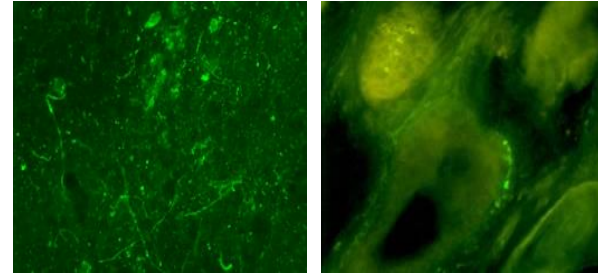
## – National and international consulting services



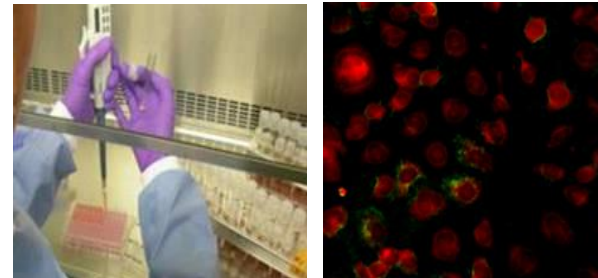


# Diagnostics

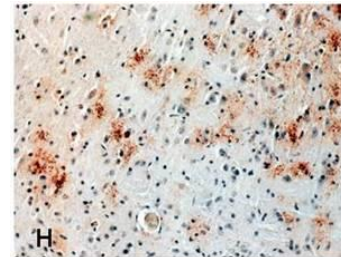
- Direct immunofluorescence test (FAT)



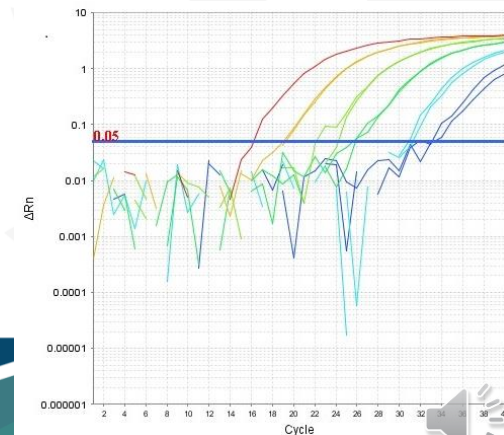
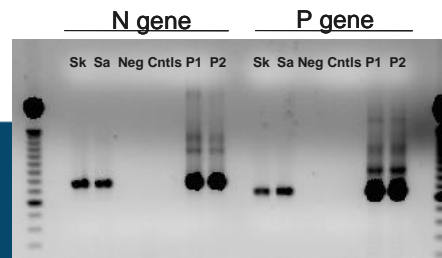
- Tissue culture inoculation test (RTCIT)



- Immunohistochemistry test on formalin-fixed specimens (IHC)



- Conventional and real-time RT-PCR (for human suspect cases)



# Research and Development

## Supporting the National Rabies Program

- Diagnostic test development
- Epidemiologic studies
- Data and science advice to inform decisions regarding:
  - Risk assessments
  - Decisions to test
  - Disease control measures for domestic animals
  - Import controls
  - Veterinary biologics

## Supporting Provincial programs for control of rabies in wildlife

- Collaborative research on oral vaccines
- Diagnostics for enhanced wildlife surveillance programs
- Serologic analyses to monitor oral vaccination field performance



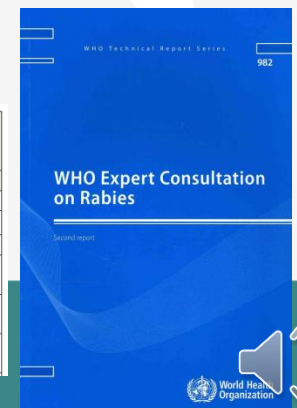
# Consulting services

- provide expert advice and consulting services, e.g., diagnostics, oral vaccination, rabies pathobiology
- train Canadian and international scientists and students in diagnostic and research techniques
- participate in international research initiatives, e.g., WHO Therapeutic mAb Project, characterization of lyssaviruses distributed globally
- participate in international proficiency panels for rabies diagnostics
- maintain large reference virus and monoclonal antibody collections and provide materials



*FDA Workshop: Developing Rabies Monoclonal Antibody Products as a Component of Rabies Post-Exposure Prophylaxis*  
FDA White Oak Campus, July 17, 2017

Time	Topic	Speaker(s) and Affiliation
7:30-8:30 am	Registration	
8:30-8:40 am	Welcome and Panel Introductions	Ed Cox, FDA
8:40-9:00 am	Opening Remarks	Sarah Connelly, FDA
9:00-9:15 am	Background on Rabies Epidemiology and Vectors	Louise Taylor, Global Alliance for Rabies Control
9:15-9:30 am	Scientific Basis for Approval of Human Rabies Immunoglobulin in Combination with Rabies Vaccine	Dorothy Scott, FDA
9:30-9:45 am	Rabies Postexposure Prophylaxis: Global Perspective on the Current Standard of Care	Henry Wilde, Chulalongkorn University, Bangkok





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of Rabies in Carnivores

# How we can support laboratory capacity building in the Americas



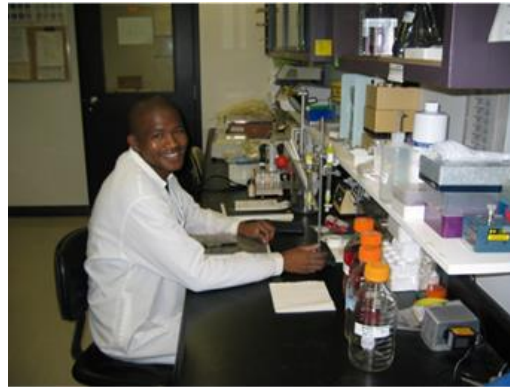
# Provision of materials and advice

- Antibodies:
  - diagnostic conjugate (FITC-labelled goat anti-RNP serum)
  - Monoclonal antibodies (anti-N gene, P gene, G-gene)
  - Polyclonal antibodies (rabbit, goat anti-RNP)
- Molecular reagents:
  - Primer and probe sequences
- Virus isolates
- Standard operating procedures
- Manuscript reprints
- Review functions; scientific advice
- No cost for materials, Materials Transfer Agreement required for biologicals



# Training opportunities

- Students, visiting scientists, sabbaticals
- WOHAH Laboratory Twinning Projects – project completed with SENASA, Peru
- No cost for training, travel expenses paid by Member country



# Research collaboration

Journal of General Virology (2005), 86, 3153–3162

DOI 10.1099/vir.0.81223-0

Antigenic and genetic characterization of rabies viruses isolated from domestic and wild animals of Brazil identifies the hoary fox as a rabies reservoir

F. Bernardi,<sup>1</sup> S. A. Nadin-Davis,<sup>2</sup> A. I. Wandeler,<sup>2</sup> J. Armstrong,<sup>2</sup>  
A. A. B. Gomes,<sup>3</sup> F. S. Lima,<sup>3</sup> F. R. B. Nogueira<sup>3</sup> and F. H. Ito<sup>1</sup>

Epidemiol. Infect. (2005), 133, 927–934. © 2005 Cambridge University Press  
doi:10.1017/S095026880500405X Printed in the United Kingdom

Detection of multiple strains of rabies virus RNA using primers designed to target Mexican vampire bat variants

E. LOZA-RUBIO<sup>1\*</sup>, E. ROJAS-ANAYA<sup>1</sup>, V. M. BANDA-RUÍZ<sup>1</sup>,  
S. A. NADIN-DAVIS<sup>2</sup> AND B. CORTEZ-GARCÍA<sup>3</sup>



Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

Virus Research 131 (2008) 8–15

Virus  
Research

[www.elsevier.com/locate/virusres](http://www.elsevier.com/locate/virusres)

A molecular epidemiological study of rabies in Puerto Rico

Susan A. Nadin-Davis<sup>a,\*</sup>, Jafet Velez<sup>b</sup>, Carlos Malaga<sup>c</sup>, Alexander I. Wandeler<sup>a</sup>

Epidemiol. Infect. (2006), 134, 1313–1324. © 2006 Cambridge University Press  
doi:10.1017/S0950268806006297 Printed in the United Kingdom

A molecular epidemiological study of rabies in Cuba

S. A. NADIN-DAVIS<sup>1\*</sup>, G. TORRES<sup>2</sup>, M. DE LOS ANGELES RIBAS<sup>2</sup>, M. GUZMAN<sup>2</sup>,  
R. CRUZ DE LA PAZ<sup>3</sup>, M. MORALES<sup>4</sup> AND A. I. WANDELER<sup>1</sup>

## Antigenic characterisation of lyssaviruses in South Africa

Authors:

Ernest Ngoepe<sup>1</sup>  
Christine Fehlner-Gardiner<sup>2</sup>  
Alexander Wandeler<sup>2</sup>  
Claude Sabeta<sup>1</sup>

There are at least six *Lyssavirus* species that have been isolated in Africa, which include classical rabies virus, Lagos bat virus, Mokola virus, Duvenhage virus, Shimoni bat virus and Ikoma lyssavirus. In this retrospective study, an analysis of the antigenic reactivity patterns of lyssaviruses in South Africa against a panel of 15 anti-nucleoprotein monoclonal antibodies was undertaken. A total of 624 brain specimens, collected between 2005 and 2009, confirmed as



Tropical Medicine and  
Infectious Disease



Article

Incorporating Direct Rapid Immunohistochemical Testing into Large-Scale Wildlife Rabies Surveillance

Kevin Middel<sup>1</sup>, Christine Fehlner-Gardiner<sup>2</sup>, Natalie Pulham<sup>1</sup> and Tore Buchanan<sup>1,\*</sup>



# How can CFIA support the Americas and contribute to the 2030 agenda?

- The CFIA Centre of Expertise for Rabies was re-designated as a WHO/PAHO CC in January 2023

Activity	Timeline
Proficiency panels for the Americas	DFA panel is in development – pilot studies completed during 2019-23 work-plan PCR panel in planning stages
Provision of materials, e.g., fluorescent conjugate, mAbs, virus isolates, protocols; for Dx and research	As requested by countries and/or WHO
Provision of training, e.g. Dx tests, molecular tools for virus characterization	As requested by countries and/or WHO
Provision of consulting, e.g., reviews, editing, scientific advice	As requested by countries and/or WHO
French translation of test protocols, guidelines, other documents	As requested by WHO
Participation in joint research/validation projects (e.g. LFDs)	As requested by WHO





Thank you

Merci

Gracias

Obrigada

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or, through Marco Vigilato [vigilato@paho.org](mailto:vigilato@paho.org)

