

POINT-OF-CARE RT-PCR ASSAY FOR RABIES

Dr. Lonika Lodha, MD
Senior Resident
Dept. of Neurovirology
NIMHANS

Importance of POCTs

- ▶ Testing performed in **close proximity** to the patient
- ▶ Results available within a timeframe that allows for an **intervention to take place while the patient is still in the care of the provider**
- ▶ Reduced need for follow-up visits - reduce patient's burden & cost of health care
- ▶ Rapid testing results ensure optimal use of limited health care resources

Types of POCTs for rabies

- ▶ Antigen detection - Lateral flow devices
- ▶ Antibody Detection - Lateral flow devices
- ▶ Nucleic acid detection - Truenat assay

Molecular testing or NAAT for infectious disease pathogens offer the advantages of improved sensitivity and specificity over antigen testing

The Truenat Platform

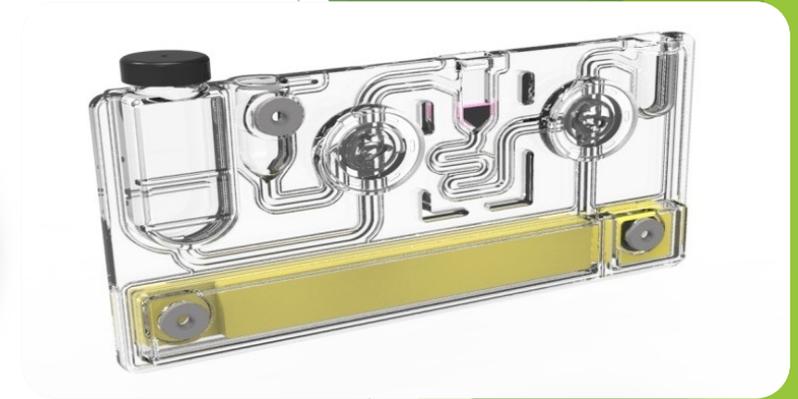


- ▶ Designed & manufactured in India
- ▶ Light weight
- ▶ Portable
- ▶ Temperature tolerance of 40° C
- ▶ Battery powered, rechargeable
- ▶ Ready to use, stabilized consumables
- ▶ >20 different infectious diseases can be tested

Platform approved as a first line molecular test for tuberculosis by WHO

Test Procedure

- ▶ Automated sample processing:
 - ▶ PCR ready DNA/RNA in 20 minutes
- ▶ Real time, quantitative microPCR.
- ▶ Portable, 8 hours battery backup
- ▶ 3 channel fluorescence
- ▶ Devices with different throughputs
- ▶ All consumables included
- ▶ Results can be printed on a portable printer, or transferred by Bluetooth
- ▶ In-built full process control



Diagnostic Performance of Truenat Assay

Specimen type	Sensitivity	Specificity	Comparator Assay
Canine brain (n=149)	100%	86.96%	DFA
Human brain (n=48)	100%	100%	

Specimen type	Cohen's Kappa	Comparator Assay
Human antemortem (n=152) (CSF, saliva, nuchal skin)	0.505 (Moderate agreement)	Routine real time RT- PCR

Practical Applications

- ▶ Seamlessly integration of rabies testing into the pre-existing diagnostic services
- ▶ Portable, battery-operated, IoT-enabled, POC real-time PCR platform
- ▶ Functions without constant power supply
- ▶ Minimal need for complex lab infrastructure
- ▶ User-friendly operation with rapid turnaround time of 1 h
- ▶ Individual sample processing, mitigating cross-contamination risks.
- ▶ Reagents stable at temperatures up to 40° C
- ▶ Eliminate the need for sample storage and transportation from peripheral areas
- ▶ Reduce the burden of testing at referral centers

International Availability

- ▶ India
 - ▶ **Currently licenced for animal rabies diagnosis**
 - ▶ Licencing process ongoing for human rabies diagnosis
- ▶ Bhutan, Bangladesh, Indonesia, Nepal, Sri Lanka, Timor-Leste
 - ▶ Platform **already in use** for other infectious diseases diagnosis
- ▶ Malaysia
 - ▶ Platform **likely to be available soon**

RESEARCH ARTICLE

Evaluation of a rapid, chip-based, micro-PCR assay for detection of rabies virus in human and canine specimens

Lonika Lodha¹  | Ashwini M. Ananda¹  | Arya Ramachandran¹ |
Sathya Priya Manuel¹ | Sujatha Valagere Sannaiah¹ | Anita Mahadevan² |
Reeta S. Mani¹ 

Thank you