

Direct Detection of Active Vector-Borne Infection RNA-Based Molecular Imaging for Complex Clinical Presentations

THE CLINICAL PROBLEM

In patients with suspected vector-borne disease, standard **diagnostics frequently fall short** in three common scenarios:

- Persistent or relapsing symptoms with negative or inconclusive serology
- Suspected co-infection where clinical presentation is heterogeneous
- Ongoing symptoms despite prior or current treatment

There is a diagnostic gap in precisely the patients who are most difficult to manage. Immunological tests (antibody- or cellular-based tests) may reflect exposure, not necessarily current infection. DNA-based methods may detect the presence of organisms, but do not distinguish between inactive remnants and metabolically active pathogens. And, a compromised immune system may not be a reliable reporter of infection.

THE TLAB APPROACH

TLab uses a direct detection model to find active infection and related inflammation. This approach integrates:

- **RNA-based molecular imaging (FISH)** - Detects ribosomal RNA within organisms, indicating metabolic activity and viability
- **High-resolution cellular imaging** - Evaluates host response, including inflammatory and structural changes at the cellular level

Together, these methods provide a **functional view of infection**, rather than relying solely on indirect or static markers.

WHAT THIS ENABLES CLINICALLY

TLab testing is designed to support clinical decision-making in cases where conventional approaches are limited.

- **Clarifying Active Infection** - Identify metabolically active organisms when serology is negative or inconclusive.
- **Evaluating Complex Presentations** - Support assessment of patients with overlapping or non-specific symptoms where co-infection is suspected.
- **Informing Treatment Strategy** - Provide organism-specific and host-response information that may influence therapeutic approach.

- **Monitoring Treatment Response** - Assess changes in detectable organism activity and inflammatory patterns over time.

WHEN TO CONSIDER TESTING

TLab testing may be appropriate when:

- Clinical suspicion remains high despite negative standard testing
- Symptoms persist without a clear diagnosis
- There is concern for multi-pathogen involvement
- Additional data is needed to guide or reassess treatment

DIFFERENTIATION

Unlike conventional approaches, TLab testing focuses on:

- **Direct visualization of pathogens in patient specimens**
- **Detection of RNA as a marker of active infection**
- **Integration of pathogen presence with host inflammatory response**

This represents a **complementary diagnostic layer**, not a replacement for standard testing.

OPERATIONAL OVERVIEW

- Physician orders test kit
- Specimen collected and returned via FedEx
- Analysis performed using molecular imaging and microscopy
- Results delivered through secure physician portal
- Typical turnaround time: 4 weeks

PARTNERSHIP

TLab works with physicians managing complex, unresolved, or treatment-resistant cases where additional diagnostic clarity may impact care.

Provider accounts enable:

- Test ordering
- Kit management
- Secure access to results