



# Legionella Reference Center Quick Reference Guide

The *Legionella* Reference Center (LRC) is located at the State Hygienic Laboratory at the University of Iowa. The LRC was selected through a competitive process to perform quality *Legionella* testing on clinical specimens and isolates and environmental isolates and outbreak samples submitted by governmental public health or environmental laboratories, with support from the Association of Public Health Laboratories (APHL) and the US Centers for Disease Control and Prevention (CDC).

## Requirements for Submitting to the LRC

The LRC accepts clinical specimens, environmental samples and both clinical and environmental *Legionella* isolates from enrolled submitters, according to the requirements laid out below and in **Table 1**. All shipping costs are the responsibility of the submitting laboratory.

Clinical specimens submitted to the LRC must originate from an individual with [signs and symptoms clinically compatible with Legionnaires' disease](#) or have an epidemiological link to suspected or confirmed cases or sources of *Legionella*.

Environmental samples must be collected as part of an outbreak investigation. Testing for routine monitoring or remediation purposes is not offered at the LRC. Testing of environmental samples must be pre-approved by APHL, CDC and the LRC via an Environmental Testing Assistance Request Form. Submission of this form is required for each investigation before collecting and shipping samples and approval decisions will be considered based on the characteristics of the outbreak, availability of resources and additional relevant factors. Consultation with the CDC and LRC is available if needed for development or review of a sampling plan.

Being an enrolled submitter does not guarantee acceptance of samples; clinical specimens, environmental samples and isolates must meet the LRC sample and shipping requirements (**Table 1**), and environmental samples must have preapproval.

## LRC Testing

The LRC utilizes real-time PCR and/or culture identification to test for *Legionella* in clinical and environmental specimens, samples and isolates. Clinical specimens and isolates are tested with CLIA-validated methods. See the [LRC Testing Workflows](#) for more information.

**Real-time PCR** detects *Legionella* species, *L. pneumophila* and *L. pneumophila* serogroup 1. Screening PCR is performed on clinical specimens and confirmation PCR on clinical isolates recovered or received. PCR is only performed on environmental isolates recovered or received—not directly on samples.

**Culture and identification** includes culture with selective media. If *Legionella* is isolated, MALDI-TOF is performed, which can identify up to 47 species of *Legionella*. Quantitative results are reported for environmental bulk water samples.

### Submitter Eligibility and Enrollment

All US state, local and territorial public health and environmental laboratories are eligible to enroll with the LRC. An [enrollment application](#) must be submitted and approved prior to requesting testing assistance. Applicants must have a [free APHL account](#) to access the application.

# Results Reporting

Clinical and environmental results are available to the submitting laboratory via the LRC's secure web portal. Submitters can monitor the status of their requests and sign-up to receive email notifications when samples are received and test results are available.

The LRC also reports de-identified results to CDC. However, this does not replace state case notifications to CDC, which should be submitted per the state's usual protocol.

**Table 1: LRC Sample and Shipping Requirements**

Sample Type	Sample Source	Min. Sample Volume	Sample Storage	Shipping Requirements
Clinical Specimens	Sputum	3 mL	2-8 °C	Ship overnight to ensure arrival at the LRC within 24 hours of collection.  Ship with frozen ice packs.
	Bronchial alveolar lavage			
	Other lower respiratory tract specimens			
	Lung tissue	Pea-sized or larger		
Clinical <i>Legionella</i> Isolates	On BCYE plate/slant	N/A	<ul style="list-style-type: none"> <li>2-8 °C up to 4 days</li> <li>Frozen (<math>\leq 20^{\circ}\text{C}</math>) in calf serum up to 40 days.</li> </ul>	<ul style="list-style-type: none"> <li><b>Not Frozen:</b> Ship overnight at ambient temperature or with ice packs</li> <li><b>Frozen in calf serum:</b> Ship on dry ice.</li> </ul>
Environmental Samples With Preapproval	Bulk water	1 L	2-8 °C	Ship overnight within 24 hours of collection to ensure arrival at the LRC within two days of collection.  Ship with frozen ice packs.
	Hot water tank sediment	120 mL		
	Cooling tower water			
	Swabs	N/A		
	Filter Media	300-500 mL		
Environmental <i>Legionella</i> Isolates	On BCYE plate/slant	N/A	<ul style="list-style-type: none"> <li>2-8 °C up to 4 days</li> <li>Frozen (<math>\leq 20^{\circ}\text{C}</math>) in calf serum up to 40 days.</li> </ul>	<ul style="list-style-type: none"> <li><b>Not Frozen:</b> Ship overnight at ambient temperature or with ice packs</li> <li><b>Frozen in calf serum:</b> Ship on dry ice.</li> </ul>

**Table 2: LRC Tests and Estimated Turnaround Times (TAT) from Submission**

Sample Type	Estimated TAT	
	Real-time PCR	Culture Identification
Clinical Specimens	1-3 days	$\leq 14$ days
Clinical <i>Legionella</i> Isolates	4-7 days*	N/A
Environmental Samples	N/A	13-18 days
Environmental <i>Legionella</i> Isolates	4-7 days*	N/A

\* Estimated TAT for Real-time PCR of isolates is based on the date of receipt or recovery of the isolates.

## Questions

If you have questions about enrolling in the LRC or submitting, please reach out to: [infectious.diseases@aphl.org](mailto:infectious.diseases@aphl.org) or [SHL-LRC@iowa.uiowa.edu](mailto:SHL-LRC@iowa.uiowa.edu).