



NC DEPARTMENT OF  
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HUMAN SERVICES**  
Division of Public Health

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**SCOTT M. SHONE, PhD, HCLD (ABB)** • Laboratory Director, State  
Laboratory of Public Health

# Memo

**To:** North Carolina Clinical Laboratories

**From:** Scott M. Shone, PhD, HCLD(ABB), Public Health Laboratory Director

**Date:** August 21, 2024

**Re:** Submission of Carbapenem-Resistant Enterobacterales, *Pseudomonas aeruginosa*, and *Acinetobacter baumannii* isolates for Characterization.

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**The North Carolina State Laboratory of Public Health (NCSLPH) requests that clinical laboratories in the state submit all carbapenem-resistant Enterobacterales (CRE), *Pseudomonas aeruginosa* (CRPA), and *Acinetobacter baumannii* (CRAB) isolates to NCSLPH.**

Submission of CRE, CRPA, and CRAB isolates to NCSLPH is requested even when laboratories conduct their own carbapenemase testing. The purpose of isolate submission to NCSLPH is to support statewide efforts to prevent the spread of multidrug-resistant organisms (MDROs) and facilitate coordination between clinical and public health partners; it is not to confirm the results of completed clinical testing. Since 2019, this testing has identified novel, uncommon, and rare carbapenem resistance mechanisms, enabling a robust public health response. NCSLPH also works with the CDC to conduct whole genome sequencing (WGS) when further genetic characterization is necessary.

Submission of CRE, CRPA, and CRAB isolates supports the following key public health goals:

- Characterize carbapenemase production using both molecular and phenotypic testing methods, allowing identification of rare carbapenemases that may be missed by PCR testing alone.
- Conduct further genetic characterization through whole genome sequencing (WGS) to identify transmission patterns and enable epidemiologic investigation of linked cases.
- Contribute isolates to databases of MDRO sequencing results, improving nationwide readiness to respond to evolving antimicrobial resistance threats.
- Bolster NCSLPH's testing capabilities, increasing capacity for MDRO response and containment.

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES • DIVISION OF PUBLIC HEALTH • STATE LABORATORY OF PUBLIC HEALTH

LOCATION: 4312 District Drive, Raleigh, NC 27607

MAILING ADDRESS: 1918 Mail Service Center, Raleigh, NC 27699-1918

www.ncdhhs.gov • <http://publichealth.nc.gov> • <https://slph.dph.ncdhhs.gov/> • TEL: 919-733-7834 • FAX: 919-733-8695

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## NCSLPH CRE, CRPA, and CRAB Submission Guidelines

Pathogen	If an isolate meets at least one of the following criteria, please submit it to the NCSLPH
<b>Enterobacterales* (CRE)</b> – Resistant to meropenem, imipenem, or ertapenem	<ol style="list-style-type: none"> <li>1. Positive Phenotypic test</li> <li>2. Positive PCR test</li> <li>3. Phenotypic test not completed</li> <li>4. Discrepant results between PCR and Phenotypic tests</li> </ol>
<b>Pseudomonas aeruginosa (CRPA)</b> – Resistant to meropenem or imipenem	<ol style="list-style-type: none"> <li>1. Positive Phenotypic test</li> <li>2. Positive PCR test</li> <li>3. Phenotypic test not completed</li> <li>4. Discrepant results between PCR and Phenotypic tests</li> </ol>
<b>Acinetobacter baumannii (CRAB)</b> – Resistant to any carbapenem	<ol style="list-style-type: none"> <li>1. Resistant to any carbapenem</li> <li>2. Molecular detection of carbapenemases</li> </ol>
<p><b>*Carbapenem resistance is commonly encountered in several genera in the Enterobacterales family, including <i>Citrobacter</i>, <i>Enterobacter</i>, <i>Escherichia</i>, <i>Klebsiella</i>, <i>Morganella</i>, <i>Proteus</i>, <i>Providencia</i>, and <i>Serratia</i>.</b></p>	

**Carbapenem-resistant Gram-negative bacilli not in the order Enterobacterales (excluding intrinsic resistance), such as the genera *Acinetobacter* and *Pseudomonas*, can also be submitted to NCSLPH.**

All CRE, CRPA, and CRAB testing and shipping is free through NCSLPH. Please ship isolates via FedEx to the following address:

NCSLPH ARLN  
North Carolina State Laboratory of Public Health  
4312 District Drive  
Raleigh, NC 27607

Alternatively, laboratories can work with their Local Health Department to ship through the NC DOA Medical Courier.

Review steps for isolate submission:

1. If shipping materials are needed, including TSA slant media and labels, please contact the NCSLPH ARLN team at [slph.arln@dhhs.nc.gov](mailto:slph.arln@dhhs.nc.gov).
2. Completely fill out NCSLPH [Enteric Bacteriology \(Enterobacterales\) Form DHHS 3390](#)
  - a. For “Specimen Type” select “Reference isolate” and provide the identification of the organism in the section box titled “Microbiology Test request/Pathogen(s) identified”.
    - i. Also, mark “ARLN Panel” box in this section
3. Submission of CRE, CRPA, or CRAB on TSA slant is preferred.
4. Label agar with two patient identifiers. Place completed DHHS form 3390 (one form per specimen) in outer container to avoid contamination in case of breakage or leakage.
5. All specimens must be packaged as UN3373 Category B, Biological Substance.

Thank you for your continued partnership as we all work to prevent the spread of multidrug-resistant organisms. For questions related to isolate submission, please contact NCSLPH Microbiology Unit at 919-733-7367 or [slph.arln@dhhs.nc.gov](mailto:slph.arln@dhhs.nc.gov).