

## Overview

### Useful For

Preferred test for diagnosing D-lactate acidosis, especially in patients with jejunioileal bypass and short-bowel syndrome

### Special Instructions

- [Biochemical Genetics Patient Information](#)

### Method Name

Gas Chromatography Mass Spectrometry (GCMS) Stable Isotope Dilution Analysis

### NY State Available

Yes

## Specimen

### Specimen Type

Urine

### Specimen Required

**Supplies:** Urine Tubes, 10 mL (T068)

**Container/Tube:** Plastic urine tube

**Specimen Volume:** 0.50 mL

#### Collection Instructions:

1. Collect a timed or random urine specimen.
2. No preservative.
3. Immediately freeze specimen.

### Forms

[Biochemical Genetics Patient Information](#) (T602)

### Specimen Minimum Volume

0.15 mL

### Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

### Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Ambient	90 days	

	Refrigerated	90 days	
	Frozen (preferred)	90 days	

## Clinical & Interpretive

### Clinical Information

D-lactate is produced by bacteria residing in the colon when carbohydrates are not completely absorbed in the small intestine. When large amounts of D-lactate are present, individuals can experience metabolic acidosis, altered mental status (from drowsiness to coma) and a variety of other neurologic symptoms, in particular dysarthria and ataxia. Although a temporal relationship has been described between elevations of plasma and urine D-lactate and the accompanying encephalopathy, the mechanism of neurologic manifestations has not been elucidated.

D-lactic acidosis is typically observed in patients with a malabsorptive disorder, such as short-bowel syndrome, or following jejunioileal bypass. In addition, healthy children presenting with gastroenteritis may also develop the clinical presentation of D-lactic acidosis.

Routine lactic acid determinations in blood will not reveal abnormalities because most lactic acid assays measure only L-lactate. Accordingly, D-lactate analysis must be specifically requested (eg, DLAC / D-Lactate, Plasma). However, as D-lactate is readily excreted in urine, this is the preferred specimen for D-lactate determinations.

### Reference Values

0.0-0.25 mmol/L

### Interpretation

Increased levels are diagnostic.

### Cautions

The test performed is for D-lactate. This is a product of bacterial overgrowth in the gastrointestinal tract. It should not be confused with L-lactate, which accumulates in some metabolic acidosis.

### Clinical Reference

1. Brandt RB, Siegel SA, Waters MG, Bloch MH. Spectrophotometric assay for D-(-)-lactate in plasma. *Anal Biochem.* 1980;102(1):39-46
2. Khrais A, Ali H, Choi S, Ahmed A, Ahlawat S. D-Lactic Acidosis in Short Bowel Syndrome. *Cureus.* 2022;14(5):e25471. doi:10.7759/cureus.25471
3. Bianchetti DGAM, Amelio GS, Lava SAG, et al. D-lactic acidosis in humans: systematic literature review. *Pediatr Nephrol.* 2018;33(4):673-681. doi:10.1007/s00467-017-3844-8

## Performance

### Method Description

Urine is spiked with a mixture of internal standards and evaporated. The dry residue is derivatized with DATAN to form the diastereomeric molecules, then acidified and extracted with ethyl acetate. After evaporation, the dry residue is again

derivatized to form trimethylsilyl (TMS) esters at the carboxylic acid moiety. Specimens are then analyzed by capillary gas chromatography mass spectrometry selected ion monitoring using positive chemical ionization with chromatographic separation of the L,L- and D,L-diastereoisomers of derivatized lactate, corresponding to L-Lactate and D-Lactate, respectively. (Ding X, Lin S, Weng H, Liang J. Separation and determination of the enantiomers of lactic acid and 2-hydroxyglutaric acid by chiral derivatization combined with gas chromatography and mass spectrometry. J Sep Sci. 2018;41(12):2576-2584)

**PDF Report**

No

**Day(s) Performed**

Monday, Thursday

**Report Available**

3 to 6 days

**Specimen Retention Time**

1 month

**Performing Laboratory Location**

Rochester

**Fees & Codes****Fees**

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact [Customer Service](#).

**Test Classification**

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

**CPT Code Information**

83605

**LOINC® Information**

Test ID	Test Order Name	Order LOINC® Value
DLAU	D-Lactate, U	14046-7

Result ID	Test Result Name	Result LOINC® Value
8873	D-Lactate, U	14046-7