Overview

Useful For

Interpretation for the aid in the diagnosis of tularemia caused by *Francisella tularensis*

This assay should **not be used** as a test of cure as it is not quantitative and patients may remain seropositive for months to years following resolution of disease.

Method Name

Only orderable as part of a profile. For more information see *Francisella tularensis* Antibody, IgM and IgG, ELISA, Serum.

Technical Interpretation

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Only orderable as part of a profile. For more information see *Francisella tularensis* Antibody, IgM and IgG, ELISA, Serum.

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject
Other	Heat inactivated specimen

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Frozen	30 days	

Clinical & Interpretive

Clinical Information

Francisella tularensis is a small, intracellular, coccobacillary Gram negative bacterium and is an obligate pathogen in animals and humans, primarily maintained in rabbits, hares, cats, ticks and deerflies. *F tularensis* is found throughout North America and parts of Asia, and similar to *Brucella* species is considered a potential agent of bioterrorism. Human infection with *F tularensis* usually occurs through inhalation of infected aerosols, ingestion of contaminated meat or water, handling of diseased or sick animals, or through the bite of an infected arthropod (eg, tick, deerflies).

Following a 3 to 5 day incubation period, the clinical manifestations of infection with *F tularensis* differ primarily depending on the site and route of infection. The most common form of disease is ulceroglandular (45%-80% of cases), which is associated with an arthropod (or animal) bite or another cause of skin barrier compromise. This leads to development of a painful papule which ultimately ulcerates following which the bacterium enters the lymphatic system. Glandular tularemia is similar in presentation to ulceroglandular disease, however it lacks the ulceration and more frequently causes septicemia. Other, less frequent clinical manifestations include oculoglandular (Parinaud syndrome), oropharyngeal and gastrointestinal disease, pneumonic or typhoidal tularemia.

Diagnostic testing options for *F tularensis* primarily include culture and serology. Physicians suspecting tularemia should collect appropriate specimens (eg, skin lesion biopsy, lymph node aspirates, etc.) promptly and send for culture. The microbiology laboratory should be alerted to the possibility of *F tularensis* to ensure that appropriate safety measures are taken to protect the laboratory technologists. Growth on culture is a definitive means of making a diagnosis of tularensis. Serologic testing may be used to support a diagnosis of current or recent tularensis in patients who are IgM positive, or seroconvert to IgM, or IgG positive in paired sera collected 2 to 3 weeks apart.

Reference Values

Only orderable as part of a profile. For more information see *Francisella tularensis* Antibody, IgM and IgG, ELISA, Serum.

Interpretation

IgM Result	IgG Result	Interpretation
Negative	Negative	No antibodies to *Francisella tularensis* detected. Antibody response may be negative in samples collected too soon following infection/exposure. Repeat testing on a new sample if clinically indicated.
Positive	Negative	IgM class antibodies to *F tularensis* detected, suggesting current or recent infection. Repeat testing in 2 to 3 weeks to detect seroconversion of IgG may be considered to confirm the diagnosis.
Positive	Borderline	

Borderline	Negative	Questionable presence of IgM antibodies to *F tularensis*. Consider repeat testing in 1 to 2 weeks.
Borderline	Positive	IgG class antibodies to *F tularensis* detected suggesting recent or past infection. Clinical correlation alongside presentation, exposure history and other laboratory findings required.
Borderline	Borderline	Questionable presence of IgM and IgG class antibodies to *F tularensis*. Consider repeat testing in 1 to 2 weeks.
Positive	Positive	IgM and IgG class antibodies to *F tularensis* detected suggesting current, recent or past infection. Clinical correlation alongside presentation, exposure history and other laboratory findings required.
Negative	Positive	IgG class antibodies to *F tularensis* detected suggesting recent or past infection. Clinical correlation alongside presentation, exposure history and other laboratory findings required.
Negative	Borderline	Questionable presence of IgG antibodies to *F tularensis*. Consider repeat testing in 1 to 2 weeks.

Cautions

False negative results may occur in samples collected too soon following symptom onset, prior to the development of a detectable immune response. Repeat testing on new samples collected 2 to 4 weeks later may be helpful.

False positive results may occur in patients previously or currently infected with *Brucella* species. Other less frequent causes of cross-reactivity that have been reported include prior infection with *Yersinia*, *Salmonella* or *Legionella* species.

IgM-class antibodies may be detectable as soon as 1 week after symptom onset and may remain detectable for multiple years following resolution of disease in some individuals. Therefore, an IgM positive result may not indicated current or recent infection in some cases.

There are multiple subspecies of *Francisella tularensis*, including *F tularensis* subspecies *tularensis*, *F tularensis* subspecies *holarctica* and *F tularensis* subspecies *novicida* that are found throughout the norther hemisphere, including in the United States. The IgM and IgG anti-*F tularensis* ELISA tests used at Mayo Clinic Laboratories are based on the lipopolysaccharide (LPS) antigen of *F tularensis*. Although not directly tested, previous studies indicate that there are no antigenic differences between the LPS of *F tularensis* subspecies *tularensis* and the other subspecies. Therefore, these assays should not be used to differentiate between infection with the various *F tularensis* subspecies.

Clinical Reference

1. Petersen JM, Schriefer ME, Araj GE: *Francisella* and *Brucella.* In Manual of Clinical Microbiology. 12th Edition. 2019

2. Nigrovic LE, Wingerter SL: Tularemia. Infect Dis Clin North Am. 2008; 22(3): 489-504. doi: 10.1016/j.idc.2008.03.004

Performance

Method Description

Automated interpretation of IgM and IgG antibody results for *Francisella tularensis.*

PDF Report

No

Performing Laboratory Location

Rochester

Fees & Codes

Test Classification

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
TULI	F. tularensis Interpretation	93718-5

Result ID	Reporting Name	LOINC®
TULI	F. tularensis Interpretation	93718-5