Test Definition: LFRI

Progentec aiSLE DX Lupus Flare Risk Index, Plasma

Overview

Useful For
Aiding in the assessment of risk of flare in lupus patients when used in conjunction with standard clinical assessment

Highlights
This advanced biomarker-based blood test can help assess the risk of a systemic lupus erythematosus-related flare within the next 12 weeks.

Method Name
Immunoassay

NY State Available
No

Specimen

Specimen Type
Plasma

Ordering Guidance
This test is intended to be ordered for adult patients. If the test is ordered for a patient younger than 18 years testing will be canceled.

Shipping Instructions
Specimen must be shipped frozen. Testing will be canceled if received ambient or refrigerated.

Specimen Required
Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Yellow top (ACD solution A)
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions:
1. Centrifuge at 1500 x *g* for 20 minutes.
2. Aliquot plasma into plastic vial.
3. Freeze specimen within 2 hours of collection.

Note: Critical frozen. Separate specimens must be submitted when multiple tests are ordered.

Specimen Minimum Volume
0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Heat-treated specimen	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Plasma	Frozen	74 days	

Clinical & Interpretive

Clinical Information

This test measures the concentrations of a set of immune modulatory soluble mediators, including cytokines, chemokines, and soluble receptors shown to be altered in plasma prior to clinical disease flare in patients with systemic lupus erythematosus. (1) A proprietary weighted algorithm is used to calculate the patient's flare risk index (FRI) score ranging from -30 to +30. The magnitude of the score indicates the patient's risk of developing a flare in the next 12 weeks. Decision curve analysis was used to define cutoff values for low (<-6.4), medium (-6.4 to 9.0), and high (>9.0) risk scores. Applying these cutoff values a maximum sensitivity of 97% and maximum specificity of 98% was observed for the FRI. Additional complementary analyses demonstrated that a patient with a positive score is over 5 times more likely to flare in the next 12 weeks than a patient with a negative score (odds ratio =5.2, p=0.0001). A patient with a positive score >9.0 is highly likely to flare (odds ratio of 9.3, p=0.0233) while a patient with a negative score less than 6.4 is not likely to flare (odds ratio of 18.0, p=0.0003).

The following 11 biomarkers are analyzed and used to calculate the FRI test score: B-lymphocyte stimulator (BLyS/BAFF), interleukin-4 (IL-4), IL-5, IL-7, IL-17A, monocyte chemoattractant protein-1 (MCP1), monocyte chemoattractant protein-3 (MCP3), osteopontin (OPN), tumor necrosis factor-alpha (TNF-a), TNF receptor 1 (TNFR1), and TNFR2. These proteins represent several major immune pathways including chemokine/adhesion (MCP-1, MCP-3), homeostasis (IL-7), Th1-type (OPN), Th-2-type (IL-4, IL-5), Th-17-type (IL-17A), and the TNFR superfamily (BlyS/BAFF, TNF-a, TNFR1, TNFR2).

Reference Values

Monocyte chemoattractant protein-1 (MCP1)/CCL2: 54-368 pg/mL
Interleukin-5 (IL-5): 0.260-2.000 pg/mL
Interleukin-17A (IL-17A): 2.100-11.000 pg/mL
Interleukin-7 (IL-7): 1.10-12.00 pg/mL
Interleukin-4 (IL-4): 1.000-3.200 pg/mL
Tumor necrosis factor-a (TNF-a): 1.80-12.00pg/mL
Monocyte chemoattractant protein-3 (MCP3)/CCL7: 0.82-16.00pg/mL
B Lymphocyte Stimulator (BAFF)/BLys: 370-995 pg/mL
Osteopontin (OPN): 14,958-95,972 pg/mL

Tumor necrosis factor receptor 1 (TNFR1)/TNFRSF1A: 617-1595 pg/mL
Tumor necrosis factor receptor 2 (TNFR2)/TNFRSF1B: 1079-3589 pg/mL

Interpretation

This test measures the concentrations of 11 blood plasma proteins. An algorithm is applied to these concentrations to calculate a flare risk index score that ranges from -30 to +30 with the magnitude indicating the likelihood of the patient experiencing a lupus flare in the next 12 weeks.

Cautions

Clinical interpretation of individual biomarker levels has not been established but may be indicative of the pathophysiology of immune, infectious, or inflammatory pathologies.

Clinical Reference

1. Munroe ME, Blankenship D, DeFreese D, et al. A flare risk index informed by select immune mediators in systemic lupus erythematosus. Arthritis Rheumatol. 2023;75(5):723-735. doi:10.1002/art.42389
2. Thanou A, Jupe E, Purushothaman M, Niewold TB, Munroe ME. Clinical disease activity and flare in SLE: Current concepts and novel biomarkers. J Autoimmun. 2021;119:102615. doi:10.1016/j.jaut.2021.102615
3. Munroe ME, Vista ES, Merrill JT, Guthridge JM, Roberts VC, James JA. Pathways of impending disease flare in African-American systemic lupus erythematosus patients. J Autoimmun. 2017;78:70-78. doi:10.1016/j.jaut.2016.12.005
4. Munroe ME, Vista ES, Guthridge JM, Thompson LF, Merrill JT, James JA. Proinflammatory adaptive cytokine and shed tumor necrosis factor receptor levels are elevated preceding systemic lupus erythematosus disease flare. Arthritis Rheumatol. 2014;66(7):1888-1899. doi:10.1002/art.38573

Performance

Method Description

Analyte specific antibodies are pre-coated onto a microfluidic Simple Plex cartridge. Samples are diluted and added to the cartridge. The sample runs through a microfluidic channel that binds the protein of interest. The Ella platform washes off any unbound analyte and adds a detection reagent. Each channel utilized for analyte capture encompasses three glass nano reactors coated with a capture antibody, providing analyte values in triplicate. A calculated analyte value is then generated from the factory-calibrated standard curve that is built into every cartridge.

PDF Report

Referral

Day(s) Performed

Wednesday

Report Available

1 to 14 days

Specimen Retention Time

7 days

Performing Laboratory Location

Progentec Diagnostics, Inc

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

Progentec Diagnostics developed and characterized this test. It is intended for clinical use and the reported results should be interpreted in relation to each patient's clinical condition and medical history. This test is a laboratory developed test (LDT) and is not cleared by the US Food and Drug Administration (FDA). Progentec Diagnostics Clinical Laboratory is certified under the Clinical Laboratory Improvement Amendment (CLIA) of 1988 and accredited by the College of American Pathologists to perform high complexity clinical testing.

CPT Code Information

0447U

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
LFRI	Lupus Flare Risk Index, P	Not Provided

Result ID	Test Result Name	Result LOINC® Value
FR1	Mono chemoattrac prot-1 (MCP1) CCL2	Not Provided
FR2	Interleukin 5 (IL-5)	Not Provided
FR3	Interleukin 17A (IL-17A)	Not Provided
FR4	Interleukin 7 (IL-7)	Not Provided
FR5	Interleukin 4 (IL-4)	Not Provided
FR6	Tumor necrosis factor alpha	Not Provided
FR7	Mono chemoattrac prot-3 (MCP3) CCL7	Not Provided
FR8	B Lymphocyte Stimulator (BAFF) BLyS	Not Provided
FR9	Osteopontin (OPN)	Not Provided
FR10	Tumor necrosis factor receptor 1	Not Provided
FR11	Tumor necrosis factor receptor 2	Not Provided
FR12	aiSLE DX FRI Score	Not Provided
FR13	Comments	Not Provided