Lab Dept: Chemistry

Test Name: LYMPHOCYTE PROLIFERATION TO MITOGENS

General Information

Lab Order Codes: MPRB

Synonyms: Mitogen Profile; Mitogen Studies; Blastogenesis Mitogens; Mitogen Stimulation

CPT Codes: 86353 – Lymphocyte transformation, mitogen or antigen induced blastogenesis

Test Includes: Viability of lymphocytes to help determine impaired T-cell function. Peripheral blood mononuclear cells (PBMC) are cultured in vitro with plant lectins (mitogens) such as phytohemagglutinin (PHA) and pokeweed mitogen (PWM).

To ensure the most reliable results, if insufficient peripheral blood mononuclear cells are isolated from the patient's sample due to low white blood cell counts or specimen volume received, selected dilutions or stimulants may not be tested at the discretion of the laboratory.

Testing with one stimulant will always be performed. When adequate specimen is available for both stimulants to be tested, the second stimulant will be evaluated at an additional charge.

Logistics

Test Indications: Assessing T-cell function in patients on immunosuppressive therapy, including solid-organ transplant patients.

Evaluating patients suspected of having impairment in cellular immunity.

Evaluation of T-cell function in patients with primary immunodeficiencies, either cellular (DiGeorge syndrome, T-negative SCID, etc) or combined T- and B-cell immunodeficiencies (T- and B-negative SCID, Wiskott Aldrich syndrome, ataxia telangiectasia, common variable immunodeficiency, among others) where T-cell function may be impaired.

Evaluation of T-cell function in patients with secondary immunodeficiency, either disease related or iatrogenic.

Evaluation of recovery of T-cell function and competence following bone marrow transplantation (BMT) or hematopoietic stem cell transplantation (HSCT).

Lab Testing Sections: Chemistry - Sendouts

Referred to: Mayo Clinic Laboratories (MML Test: LPMGF)

Phone Numbers: MIN Lab: 612-813-6280

STP Lab: 651-220-6550

Test Availability: Monday – Thursday ONLY

Turnaround Time: 8-11 days, test set up Monday - Friday

Special Instructions: **RESTRICTED DRAW TIME**

Specimen are recommended to arrive at the testing lab within 24 hours of draw. Collect specimen Monday through Thursday only. See Collection for important information.

For serial monitoring, it is recommended that the sample be collected at the same time of day per collection. Specimens arriving on a weekend may be cancelled.

Specimen

Specimen Type: Whole blood

Container: Green top (Sodium Heparin) tube (no gel)

Draw Volume:

Pediatric volume varies by age. Reference table below:

Patient Age	Optimal Volume
<3 months	1 mL
3 months – 24 months	3 mL
25 months - 18 years	5 mL
>18 years	20 mL

***For minimum volumes for Mitogen Only testing and Mitogen+Antigen testing based on Absolute Lymphocyte Count (ALC), refer to the reference lab catalog Specimen Requirements

Processed Volume: Same as Draw Volume

Collection: Routine venipuncture, Send specimen to the laboratory immediately after collection. **Note:** Specimens must be filled by needle through the stopper to maintain a closed system. **DO NOT** fill tube by removing the stopper.

Special Processing: Lab Staff: **Do Not** centrifuge. Send whole blood in original collection tube. Keep at room temperature.

Forward promptly Monday – Thursday ONLY. Specimens must arrive at the testing lab before 4 p.m. on Fridays.

Specimen stable ambient for 48 hours.

Patient Preparation: None

Sample Rejection: Specimens other than whole blood; anticoagulants other than sodium heparin; frozen specimens; gross hemolysis; gross lipemia; mislabeled or unlabeled specimens; specimens that have been aliquoted; specimens received past possible transport time.

Interpretive

Reference Range:

Reference name:	Result:
Viability of Lymphocytes at Day 0	>= 75.0%
Max Proliferation of PHA as %CD45	>=49.9%
Max Proliferation of PHA as %CD3	>=58.5%
Max Proliferation of PWM as %CD45	>=4.5%
Max Proliferation of PWM as %CD3	>=3.5%
Max Proliferation of PWM as %CD19	>=3.9%

Critical Values: N/A

Limitations:

When interpreting results it should be kept in mind that the range of lymphocyte proliferative responses observed in healthy, immunologically competent individuals at large. The reference ranges provided will be helpful in ascertaining the magnitude of the normal response.

Lymphocyte proliferation to mitogens is known to be affected by concomitant use of steroids, immunosuppressive agents, including cyclosporine, tacrolimus (FK506), Cellcept (mycophenolate mofetil), immunomodulatory agents, alcohol, and physiological and social stress.

Test specimens >24-hours old may give spurious results.
Diminished results may be obtained in cultures that contain excess neutrophils or nonviable cells.

Timing and consistency in timing, of blood collection is critical when serially monitoring patients for lymphocyte subsets.

Methodology:

Flow cytometry

References:

Mayo Clinic Laboratories May 2025

Updates:

1/4/2006: MML changed units from DPM to %NC. The S.I. is a measure of proliferation of the patient's cells compared to cells from a normal control tested simultaneously. MML has always tested a normal control along with patient specimens, but this is not apparent from the way results were being reported prior to 1/4/2006.
9/2/2008: Removed %NC from reporting units. Extended turnaround time, previously listed as 6-9 days.
1/18/2011: Method change, reference range change, draw volume update.
1/19/2011: Viability of Lymphs at Day 0 reference value change.
5/14/2025: Updated specimen volume requirements and recommendations. Added specimen stability. Emphasized restricted draw times.