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**Lab Dept:** Chemistry

**Test Name:** LYMPHOCYTE PROLIFERATION, MITOGENS

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***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).

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***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 Medical 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:** Specimen must arrive within 24 hours of draw. Send specimen Monday - 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.

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***Specimen***

**Specimen Type:** Whole blood

**Container:** Green top (Na Heparin) tube

**Draw Volume:**

Draw volume varies by age. Reference table below: Blood volumes are based on Absolute Lymphocyte Count (ALC)		
Patient Age	Requested Volume	Minimum Volume
<3 months	1 mL	1 mL
3 months – 5 years	2 mL	1 mL
6 – 18 years	3 mL	1 mL
>18 years	10 mL	1 mL

**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 in original collection tube. Keep at room temperature. Specify “mitogen” to differentiate from “antigen” testing. Forward promptly Monday – Thursday ONLY.

**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 on the weekend

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***Interpretive***

**Reference Range:**

Reference name:	Result:
Viability of Lymphs 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 Medical Laboratories](#) September 2017

**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.