

# Abstract

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## Comparison of ATP production in whole blood and lymphocyte proliferation in response to phytohemagglutinin.

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**BACKGROUND:** Lymphocyte proliferation in response to mitogens, phytohemagglutinin (PHA), concanavalin A, pokeweed, and/or specific antigens has been the method of choice for in vitro diagnosis of cell-mediated immune dysfunction.

**OBJECTIVE AND METHODS:** Recently, an assay to measure intracellular adenosine triphosphate (ATP) production in response to PHA has been developed that requires a shorter, overnight incubation. We compared a standard 5- to 7-day lymphocyte mitogen stimulation assay utilizing tritiated thymidine (3H-thy) incorporation to one in which ATP production in response to PHA by CD4-positive cells is measured in a luminometer that requires only 18-24 hr. A total of 20 patient samples suspected of having decreased cell-mediated immunity submitted for mitogen induced lymphocyte proliferation and 21 normal controls were tested in both assays.

**RESULTS:** A comparison of these two methods has demonstrated that the screening ATP assay has a sensitivity at 24 hr of 100% in detecting decreased PHA induced lymphocyte proliferation at 5 days and a specificity of 85% in the samples obtained from normal controls.

**CONCLUSION:** The data indicate that the ATP assay may be a useful screening tool for more rapid detection of blood samples with decreased cell-mediated immune responses. However, a positive screen should always be confirmed by 3H-thy uptake using mitogens and recall antigens like candida and tetanus.

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