



Cytokine Tests

Cytokines are chemical messengers that primarily signal the immune system, but also play a role as neuromodulators. They can be defined as either proinflammatory or anti-inflammatory. Cytokine imbalances are known to be involved in autoimmune disorders, atopic conditions as well as neuropsychiatric disorders. Testing allows analysis of not only cytokine involvement in disease but it also provides an easy solution for monitoring therapy effectiveness.

Cytokines

Cytokines are signaling proteins, and glycoproteins, that mediate and regulate immunity, inflammation, and hematopoiesis. More simply they can be described as chemical messengers between immune cells. They are also involved in cell growth and differentiation, cell death, angiogenesis, normal development and neuromodulation. Although the principal source of cytokines are the helper T cells and macrophages, most nucleated cells can produce cytokines usually as a response to injury.

Cytokines and the Immune System

Cytokines are critical to the functioning of both the innate (cell-mediated) and adaptive (antigen specific/ humoral) immune systems. A simple classification system used for cytokines is to label them as promoters of inflammation, i.e. proinflammatory cytokines, or anti-inflammatory cytokines, which either reduce inflammation or suppress the activity of proinflammatory cytokines. Proinflammatory cytokines include interferon-gamma (IFN- γ), interleukin-2 (IL2) and interleukin-12 (IL12), whereas interleukin-4 (IL4) and interleukin-5 (IL5) are examples of anti-inflammatory cytokines.

Proinflammatory cytokines are secreted from T-helper 1 (Th1) cells whose key function is to stimulate innate or cell-mediated immunity, fighting off viruses and other intracellular pathogens¹. Eliminating cancerous cells and stimulating delayed-type hypersensitivity (DTH) skin reactions are also roles of the Th1 cells. On the other hand, anti-inflammatory cytokines, secreted from T-helper 2 (Th2) cells, drive adaptive (humoral) immunity, up-regulating antibody production to fight extracellular pathogens (found outside the cells in the blood and other body fluids)¹. A healthy immune system is able to switch back and forth between the Th1 and Th2 pathways depending on the attack; when one pathway is up-regulated, the other is normally suppressed and vice versa. Under normal circumstances the Th1 and Th2 systems should be in balance.

metabolic
test



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Cytokines and Disorders of the Immune System

Overactivation of either the Th1 or the Th2 system can cause disease, being active even when there is no threat. When Th1 is dominating abnormally, organ specific autoimmune type diseases can result, as the Th1 immune cells are trying to destroy 'pathogens' inside the cells (Table 1). Disorders described as Th1 dominant conditions include organ specific autoimmune disorders; Crohn's disease, Type I diabetes and Multiple sclerosis ¹ (see Table 1).

On the other hand, when the Th2 system is dominating, disorders that are primarily allergy or antibody driven occur including asthma, atopic dermatitis, systemic autoimmune disorders and chemical sensitivities (see Table 2). The body becomes overly sensitive to 'extracellular pathogens', often reacting and producing antibodies against non-pathogenic stimuli such as food and dust. Cancer is also classified as a Th2 dominant condition. This is logical because when Th2 is dominant, Th1 immunity is suppressed whose role it is to eliminate cancer.

Table 1: Health Disorders Associated with Th1 Dominance (Upregulation of Pro-inflammatory Cytokines)

• Alzheimer's disease	• Multiple sclerosis
• Atherosclerosis	• Psoriasis
• Celiac disease	• Recurrent miscarriages
• Crohn's disease	• Rheumatoid arthritis
• Hashimoto's thyroid disease	• Type I diabetes
• Major depression	

Table 2: Health Disorders Associated with Th2 dominance (Upregulation of Anti-inflammatory Cytokines)

• Asthma	• Food Allergy (IgE mediated)
• Atopic dermatitis and eczema	• HIV
• Cancer	• Schizophrenia
• Chemical sensitivities	• Systemic lupus erythematosus

Testing for and Treating Unbalance Cytokines

Testing cytokine serum levels can determine whether an imbalanced immune system is involved in a condition. By establishing the involvement in disease, therapies can be designed to specifically target and rebalance the Th1 and/or Th2 pathways. Fortunately many nutritional supplements and herbs including vitamin D and ginseng are able to modify cytokine levels (see interpretative guide for further information). Testing allows analysis of not only cytokine involvement in disease but it also provides an easy solution for monitoring therapy effectiveness.

Analytes

- Cytokine Panel Level 1: IL1, IL6, IL10, TNF α
- Cytokine Panel Level 2: IL1, IL2, IL4, IL5, IL6, IL10, IL13, INF γ , TNF α , TNF β , TGF β

Specimen Collection Requirements

Either serum or blood collected in a SST (orange) vacutainer tube.

How to Order a Free Cytokine Test kit

Order a test kit phone Customer Services on 1300 688 522. Please note that any test kit self requested by a patient is not Medicare rebateable.

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Related tests

- Essential Fatty Acid Tests
- Inflammation Profile
- Zinc (Plasma)

Technical support

Age Diagnostic Laboratories offers technical assistance to experienced clinical consultants. Contact us on 1300 688 522 or via email: info@adl.com.au