



TEST PATIENT

GUa d`Y`HYghBUa Y
 Sex : :
 DUHY Collected : 00-00-0000
 111 H9GH`ROAD`TEST`SUBURB
 @AB =8: 00000000 UR#:0000000

TEST PHYSICIAN

DR JOHN DOE
 111 CLINIC STF 99H
 7@-B =7`GI 6I F 6`J =7`' \$\$\$

P: 1300 688 522
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INTEGRATIVE MEDICINE

BLOOD - SERUM

Hyperbaric Oxygen Therapy (HBO)

Result Range Units
120.0 Hours

CYTOKINES, Extensive Panel

ProInflammatory Cytokines (TH1)

Test Name	Result	Range	Units	Visual Scale
Interleukin 1	11.2 *H	0.0 - 2.8	pg/mL	
Interleukin 6	6.0	0.0 - 11.0	pg/mL	
Interleukin 7	30.6 *H	0.0 - 16.0	pg/mL	
Interleukin 8	124.7 *H	0.0 - 14.0	pg/mL	
TNFa	18.30	0.00 - 54.00	pg/mL	
TNFb	115.0	0.0 - 156.0	pg/mL	

AntiInflammatory Cytokines (TH2)

GM-CSF	130.3 *H	0.0 - 88.0	pg/mL	
Interleukin 2	21.7 *H	0.0 - 10.0	pg/mL	
Interleukin 4	32.1 *H	0.0 - 19.0	pg/mL	
Interleukin 5	7.6	0.0 - 13.0	pg/mL	
Interleukin 10	29.3 *H	0.0 - 6.2	pg/mL	
Interleukin 12	21.7 *H	0.0 - 14.0	pg/mL	
Interleukin 13	19.1 *H	0.0 - 6.0	pg/mL	
INFg	89.7 *H	0.0 - 3.5	pg/mL	
TGFb	57.2	28.0 - 64.0	pg/mL	

(*) Result outside normal reference range

(H) Result is above upper limit of reference rang

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Cytokines Comment**INTERLEUKIN 2 COMMENT:**

IL-2 is produced by the Th1 cells and causes growth, proliferation and activation to the activated T and B cells and NK cells.

Under physiological conditions IL2 is produced mainly by T-cells expressing the surface antigen CD4 (see also: CD antigens) following cell activation by mitogens or allogens. Several secondary signals are required for maximal expression of IL2. Resting cells do not produce IL2. In vitro the synthesis of IL2 is inhibited by dexamethasone or CsA (Cyclosporin A). Transformed T-cells and B-cells, leukemia cells, LAK cells (lymphokine-activated killer cells) and NK-cells also secrete IL2. Vitamin E can enhance the production of IL2. With increasing age the antigen- and mitogen-stimulated synthesis of IL2 and hence also T-cell mediated immune responses decrease.

INTERLEUKIN 1 COMMENT:

IL-1 is an inflammatory cytokine, mainly produced by activated macrophages and peripheral neutrophils, but other cells like smooth muscle cells, astrocytes, fibroblasts, keratinocytes, T cells, B cells and NK cells are capable of IL-1 synthesis, too.

IL-1 can be induced by a combination of other cytokines, endotoxins, viruses, mitogens and antigens.

In contrast, prostaglandin E2 and corticosteroids, lipoproteins, lipids, α 2-macroglobulin and a naturally occurring antagonist, called IL-1 receptor antagonist, inhibit IL-1 synthesis.

IL-1 mediates a wide variety of biological actions. It stimulates the production and secretion of IL-2 and the expression of IL-2 receptors by helper cells. IL-1 acts synergistically with other factors in the activation and differentiation of B cells. In synergy with TNF α , IL-1 activates osteoclasts and therefore plays an important role in the regulation of bone metabolism. IL-1 has different effects on the central nervous system.

It is an endogenous pyrogen and causes fever in humans at doses less than 1 ng/kg. Additionally, it induces the synthesis of ACTH, endorphins, vasopressin and somatostatin. Furthermore, it stimulates the activation and differentiation of NK cells, fibroblasts and thymocytes. IL-1 acts antiproliferatively on many tumor cell types, increases the tumor cytotoxicity of macrophages and induces tumor regression.

GMCSF COMMENT:

GM-CSF Granulocyte-Macrophage Colony-Stimulating Factor (GM-CSF) is a cytokine that stimulates the growth and differentiation of hematopoietic precursor cells from various lineages including granulocytes, macrophages, eosinophils and erythrocytes.

INTERLEUKIN 12 COMMENT:

IL-12 (p70) Interleukin-12 p70 (IL-12p70) is the 70 kDa subunit of IL-12. It is produced mainly by B-cells and to a lesser extent by T-cells. The most powerful inducers of IL-12 are bacteria, bacterial products, and parasites. It has been shown to augment natural killer-cell mediated cytotoxicity in a number of conditions, including patients with hairy cell leukemia, and it has been shown to inhibit the growth of a variety of experimental tumors in vivo. IL-12 also has anti-angiogenic effects in vivo, which are in part, mediated by IFN-gamma. IL-12 is potential candidate for the treatment of angiogenesis-dependent malignancies.

INTERLEUKIN 7 COMMENT:

IL-7 Interleukin-7 (IL-7) stimulates the proliferation of pre-B and pro-B-cells without affecting their differentiation. It also selectively supports the maturation of megakaryocytes. In human peripheral monocytes, IL-7 induces the synthesis of some inflammatory mediators such as IL-1 and IL-6. It also enhances the expression and

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(H) Result is above upper limit of reference rang



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secretion of IL-3 and GM-CSF in activated human T-cells. IL-7 down-regulates expression of TGF-beta in macrophages which has been suggested as an inhibitor of the antitumor immune response.

INTERLEUKIN 8 COMMENT:

IL-8 Interleukin-8 (IL-8) is a chemokine produced by macrophages that attracts neutrophils, basophils, and T-cells, but not monocytes. It may be of clinical relevance in psoriasis and rheumatoid arthritis. Elevated concentrations are observed in psoriatic scales which may explain the high proliferation rate observed in these cells. It may also be a marker of different inflammatory processes and probably plays a role in the pathogenesis of chronic polyarthritis since excessive amounts of this factor are found in synovial fluids.

INFgamma COMMENT:

INFg - Produced by Th1, Tc and NK cells. They target the macrophages, activated B cells and Th2 cells.
The function is MHC expression, Ig class switch to IgG, proliferation and pathogen elimination.

INTERLEUKIN 4 COMMENT:

IL4 is produced mainly by a subpopulation of activated T-cells (Th2) which are the biologically most active helper cells for B-cells and which also secrete IL5 and IL6 . Another subpopulation (Th1) also produces IL4 albeit to a lesser extent.
Non-T/Non-B-cells of the mast cell lineage also produce IL4.

IL4 promotes the proliferation and differentiation of activated B-cells, the expression of class II MHC antigens, and of low affinity IgE receptors in resting B-cells. IL4 is probably an autocrine growth modulator for Hodgkin's lymphomas. IL4 enhances expression of class II MHC antigens on B-cells. It can promote their capacity to respond to other B-cell stimuli and to present antigens for T-cells. This may be one way to promote the clonal expansion of specific B-cells and the immune system may thus be able to respond to very low concentrations of antigens. The production of IL4 by Non-B Non-T-cells is stimulated if these cells interact with other cells via their Fc receptors for IgE or IgG. This effect can be enhanced by IL3

IL2 and PAF (platelet activating factor) induce the synthesis of IL4 while TGF-beta inhibits it.

IL4 inhibits cell activation of NK-cells induced by IL2 . IL4 stimulates the proliferation of thymocytes with the marker spectrum CD4 (-)CD8 (-), CD4 (+)CD8 (-), CD4 (-)CD8 (+). In CD4 (+) cells IL4 induces the expression of CD8 .

In activated B-cells IL4 stimulates the synthesis of IgG1 and IgE and inhibits the synthesis of IgM, IgG3, IgG2a and IgG2b. This Isotype switching induced by IL4 in B-cells is antagonized by IFN-gamma . The growth of multiple myelomas can be suppressed by IL4 which inhibits the synthesis of IL6 , a myeloma growth factor . IL4 also inhibits the synthesis of IL6 in human alveolar macrophag

INTERLEUKIN 10 COMMENT:

IL-10 - Produced by Th2 cells, they target macrophages and B cells. Their function is cytokine production and activation.
An Anti-inflammatory cytokine which decreases with age.

INTERLEUKIN 13 COMMENT:

IL13 - Inhibits cytokine production. Synergises with IL2 in regulating Interferon-gamma synthesis.
May be critical in regulating inflammatory and immune responses.

Tests ordered: CYTOK,CFee,HBO