bio|vis DIAGNOSTIK

DAkkS Deutsche Akkreditierungsstelle D-ML-13188-01-00

Biovis Diagnostik MVZ GmbH
Dr. med. Burkhard Schütz
Wissenschaftliche Leitung
Thomas Gugerel[1]
Ärztliche Leitung
Dr. med. Herbert Schmidt[1]
Dr. med. Klaus G. Wenzel[2]

Justus-Staudt-Straße 2
65555 Limburg Offheim
[1]Facharzt für Laboratoriumsmedizin
[2]Facharzt für Nervenheilkunde

Tel.: 0 64 31 / 21 248 - 0
Fax: 0 64 31 / 21 248 - 66
E-mail: info@biovis.de
Web: www.biovis.de

External ID

Name	**Muster**	Date of Birth	**31.05.1955**	Order ID	**11630608**
First Name	**Muster**	Sex	Female	Order Date	23.11.2018
Sampling Date	21.11.2018 10:00	Validation Date	Thomas Gugerel	Findings Status	**Final Report**
Sample Material	S, E	Validation on	27.11.2018	Findings Date	28.11.2018

Test	Result	Unit	Standard Range	Previous Result
Immunology and Haematology				
Immunprofil komplett 1				
CRP	0,47	mg/l	< 5	S A) TURBID
Soluble Interleukin-2-Receptor	284,00	U/ml	223 - 710	S *EIA
Neopterin	2,0	ng/ml	< 2,5	S A) ELISA
Immunglobulin G	8,50	g/l	7 - 16	S *
Immunoglobulin A	0,84	g/l	0,7 - 4	S *
Cellular Immune Status				
Large Blood Count				
Small Blood Count				
Leucocytes	7,0	/nl	3,7 - 10,1	E A) PARTZ
Erythrocytes	4,89	Mio/µl	3,8 - 5,0	E A) PARTZ
Haemoglobin	14,10	g/dl	11,6 - 15,1	E A) PHOT
Haematocrit	**0,45**	l/l	0,34 - 0,44	E A) RECHN
MCV	93	fl	81 - 99	A) RECHN
MCH	29	pg	27 - 34	A) RECHN
MCHC	**31,10**	g/dl	32 - 36	A) RECHN
Thrombocytes	233	/nl	150 - 361	E A) PARTZ
Differential Blood Count				
Neutrophils	60,5	%	42 - 76	E NA) PARTZ
Neutrophils absolute	4235	/µl	1500 - 7000	E NA) PARTZ
Lymphocytes	31,1	%	18 - 45	E NA) PARTZ
Lymphocytes absolute	2177	/µl	1200 - 3200	E NA) PARTZ
Monocytes	6,7	%	3 - 10	E NA) PARTZ
Monocytes absolute	469	/µl	200 - 1000	E NA) PARTZ
Eosinophils	1,3	%	1 - 7	E NA) PARTZ
Eosinophile cells absolute	91	/µl	40 - 400	E NA) PARTZ
Basophile cells	0,4	%	< 2	E NA) PARTZ
Basophile cells absolute	28	/µl	15 - 50	E NA) PARTZ
Overview				

S=Serum, E=EDTA

* cooperate analytics (R), A) accredited, NA) not accredited

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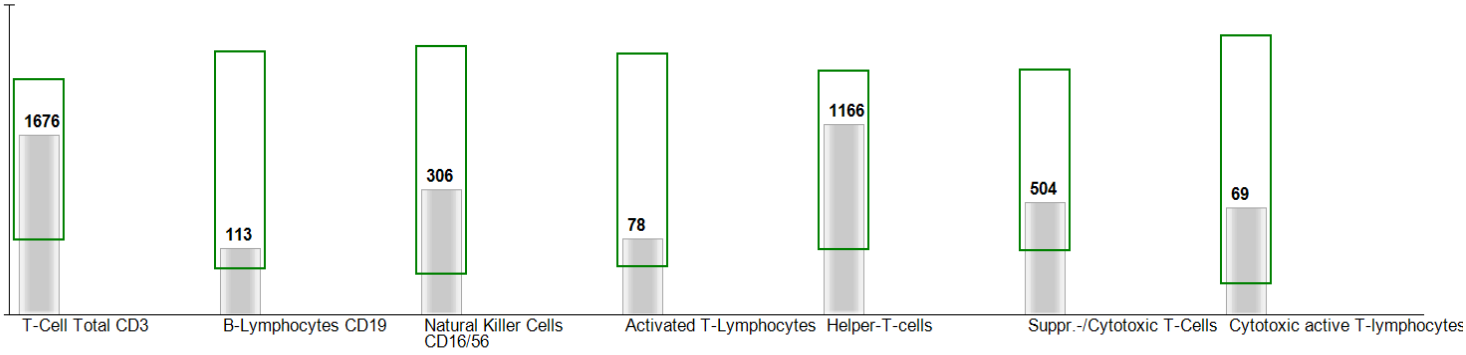

Test	Result	Unit	Standard Range	Previous Result
Lymphocyte Typing				
T-Cell Total CD3	1676	/µl	700 - 2200	E A) FLOWZY
T-Cell Total CD3 (relative)	**77,20**	%	59 - 75	E A) FLOWZY
B-Lymphocytes CD19	113	/µl	80 - 450	E A) FLOWZY
B-Lymphocytes CD19 (relative)	**5,20**	%	7 - 15	E A) FLOWZY
Natural Killer Cells CD16/56	306,08	/µl	100 - 660	E A) FLOWZY
Natural Killer Cells CD16/56 relative	14,10	%	9 - 21	E A) FLOWZY
Activated T-Lymphocytes	78	/µl	50 - 270	E A) FLOWZY
Activated T-Lymphocytes (relative)	3,60	%	2 - 10	E A) FLOWZY
T-Cell Differentiation (CD8, CD4)				
Helper-T-cells	1166	/µl	400 - 1500	E A) FLOWZY
Helper-T-cells (relative)	**53,70**	%	40 - 50	E A) FLOWZY
Suppr.-/Cytotoxic T-Cells	504	/µl	290 - 1100	E A) FLOWZY
Suppr.-/Cytotoxic T-Cells (relative)	**23,20**	%	27 - 37	E A) FLOWZY
Cytotoxic active T-lymphocytes	69	µl	20 - 180	E A) FLOWZY
Cytotoxic active T-lymphocytes relative	3,20	%	2 - 10	E A) FLOWZY
CD4/CD8 Quotient	**2,31**	Quotient	1,1 - 1,7	E A) FLOWZY
Immunoglobulin				
Total IgE	27,8	kU/l	< 100	S *ECLIA

< 20 kU/l: Allergy implausible
20 - 100 kU/l: Allergy possible
> 100 kU/l:Allergy probable

S=Serum, E=EDTA

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Laboratory-Id N°. **11630608**
Received **23.11.2018**
Report **06.12.2018**
Last Name **Muster**
First Name **Muster**
Date of Birth **31.05.1955**

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Biovis Diagnostik MVZ GmbH

Justus-Staudt-Str. 2
D-65555 Limburg Offheim

Phone: (+49) 6431 / 21248-0
Fax: (+49) 6431 / 21248-66
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Immunology

Lymphocyte Differentiation

The number of t-lymphocytes is inconspicuous.
Normally 60 – 75 % of the lymphocytes in peripheral blood belong to the group of T-lymphocytes. The T-cells are identified by the CD3 molecule complex on their surface. T-cells have special molecules on their cell surface, which are able to recognize antigens high-specifically (T-cell-antigen-receptor, TCR).
The T-cells are divided into two main groups, t-helper cells and cytotoxic T-cells. They have different responsibilities. (See below)

The number of activated T-cells is inconspicuous.
The expression of HLA-DR on the cell surface of T-cess is determined as activation marker. The expression of HLA-DR is an unspecific sign for immune system activation. With the aid of the share of activated T-cells the extent of antigen strain on the immune system can be estimated. The duration of antigen strain, however, is just as important as the extent. Very recent activations are not recorded, as HLA-DR is only expressed after 4 – 7 days.

T-helper cells (CD3+/CD4+) are inconspicuous.
T-helper cells have a central function as co-ordinators of the specific immune response. In secondary lymphatic organs they make direct cell contact with antigen-representing cells (APC, e.g. dendritic cells, macrophages and B-lymphocytes). Due to their specific antigen receptor they recognize processed antigen in connections with MHC-II molecules of the APC surface. This leads to activation and clonal proliferation of the specific T-helper cell and it secrets among others a series of locally and systemically effective cytokines, and thereby triggers proliferation, differentiation and function of cytotoxic T-cells and antibody producing B-cells. Furthermore the function of NK-cells, macrophages and granulocytes is intensified.

The number of cytotoxic T-cells (CD3+/CD8+) is inconspicuous.
While earlier CD3+/CD8+ cells were prevailingly regarded as suppressor cells, today it is assumed that the main part of this cell population is to be assigned to the group of cytotoxic T-cells. They are therefore not antagonists of T-helper cells but effector cells of the immune system. Cytotoxic T-cells are for example responsible for high-specific destruction of virus-infected cells and malign deformed body cells.
The function as regulatory cells assigned to them earlier, is according to today's knowledge taken over by regulatory T-cells, e.g. TH3-cells.

The share of cytotoxic active T-lymphocytes is inconspicuous.
Cytotoxic active T-lymphocytes are a sub-population of the cytotoxic T-cells (CD3+/CD8) and high-specifically destroy virus-infected and transformed cells. Therefore one calls them – other than the prevailingly regulatory helper cells – cytotoxic effector-T-cells. Such lymphocyte sub-population changes show confrontations of the immune system with for example virus-infected or malignant transformed cells at a very early stage

The B-lymphocyte count is within normal range.
The main responsibility of the B-lymphocytes is the synthesis of antibody molecules – immunoglobulin.
The production of antibodies normally starts after their activation by T-helper cells and transformation to plasma cells. Furthermore they can absorb pathogens with immunoglobulin molecules as highly specific antigen receptors on their surface. They can act as "professional" antigen-presenting cells and thereby trigger immune reactions. A reduction of B-cells may lead to inadequate antibody production.
Different from the T-lymphocytes, which at least in use mature and are shaped in the thymus during youth, the development, maturation and shaping of B-cells takes place in bone marrow and other lymphatic tissues right from the start.

The number of natural killer cells (NK-cells) is within normal range.

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Natural killer cells play an important part in the destruction of transformed or virus-infected cells. In this case they are not subject to regulation by T-helper cells and they do not need target cells to be marked with complement components for their attack. Nevertheless their activity depends on interleukin-2, which is produced by T-cells. Virus-infected or transformed cells are recognized by the NK-cells by missing surface characteristics. This leads directly to lysis and induction of apoptosis in the target cell.

Activity Marker of the Humoral Immune System

CRP

The absolutely inconspicuous CRP value largely excludes acute inflammatory processes.

Soluble Interleukin-2 Receptor

The inconspicuous soluble interleukin-2 receptor value argues against specific immune system activation, e.g. auto immune diseases. Also low immune functions in regard to T-cell activity or activation of NK-cells is rather unlikely.

The sIL2R level correlates with the interleukin-2 production as with increasing IL-2 levels also the IL-2 receptor expression is up-regulated. In this process the a-chain of the receptor decreases, it is then found in serum as sIL2R. Interleukin-2 is the most important stimulatory cytokine of the specific immune system. It is released by T-lymphocytes (mainly T-helper cells) and activates cytotoxic T-cells and natural killer cells. In addition IL-2 stimulates the proliferation of different lymphocyte types.

Neopterin

The determination of neopterin provides for statements about immune system activation.

Neopterin is released by macrophages, if they are stimulated by interferon gamma (from TH1-cells). Based on the neopterin findings one can draw indirect conclusions about the interferon-gamma synthesis and therefore about TH-1 activation.

Increased neopterin levels may occur in case of

- viral infections
- other intracellular pathogen infections
- rheumatoid arthritis
- sarcoidosis,
- multiple sclerosis and
- many other autoimmune
- and chronic inflammatory intestinal diseases.

In this case the **normal neopterin level** argues against macrophage activation and increased TH1-activation.

Immune Globulins

The total IgE value is inconspicuous, this, however, does not rule out an allergy. The total IgE determination is only rough diagnostic for allergic diseases and is often the reason for false positive or false negative results.
For this reason we recommend the determination of ECP and possible specific (!) IgE against suspected triggers.

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With kind regards

Your Biovis-Diagnostik

Attention: *The recommendations given are only advice based on the compiled findings and possible clinical information. They are exclusively addressed to the therapist/physician and are **not intended** for direct transfer to the patient. They cannot replace diagnosis and therapy of the treating therapist. The recommendations for therapy are a suggestion. The responsibility for the final selection/measure/dosage lies with the medical professional/therapist responsible for each individual case. Please also note that there may be contraindications/interactions associated with the recommended medication/nutritional supplements for pre-existing primary diseases and when taking certain medication. These must be investigated by the medical professional/therapist before starting therapy.*