Hematology Translational Lab (Storek-Khan Lab)
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Cytokine Report – Luminex 34-plex Panel

ORDER DETAILS

Patient Name	HELIX, Onco		
Medical Record#	XXX-XXXXX-XXX	**Physician**	Dr. XXXXX XXXXX
Date of Birth	XX-Feb-1955	**Organization**	University Hospital
Gender	M	**Address**	
Diagnosis	COVID-19		

SPECIMEN AND TEST

Specimen Type	Frozen Serum	**Date Received**	1-Apr-2020	**Report Status**	Final
Specimen ID	XX-XXX-XXXX	**Analysis Date**	2-Apr-2020	**Report Date**	5-Apr-2020

REPORT SUMMARY

No.	Cytokine	Results (pg/mL)	
1	IFN-gamma	**33.32**	*Moderate*
2	IL-12p70	**4.04**	*Very Low*
3	IL-13	**-**	*ND*
4	IL-1-beta	**4.16**	*Low*
5	IL-2	**101.87**	*High*
6	IL-4	**74.34**	*High*
7	IL-5	**105.61**	*Moderate*
8	IL-6	**150**	*High*
9	TNF-alpha	**56.02**	*Moderate*
10	GM-CSF	**-**	*ND*
11	IL-18	**13.45**	*Very Low*
12	IL-10	**6.25**	*Moderate*
13	IL-17A	**65.43**	*High*
14	IL-21	**-**	*ND*
15	IL-22	**-**	*ND*
16	IL-23	**-**	*ND*
17	IL-27	**375.41**	*High*

No.	Cytokine	Results (pg/mL)	
18	IL-9	**-**	*ND*
19	IFN-alpha	**-**	*ND*
20	IL-31	**10.84**	*High*
21	IL-15	**72.01**	*Moderate*
22	IL-1-alpha	**2.48**	*Very Low*
23	IL-1RA	**2498.3**	*Moderate*
24	IL-7	**3.06**	*Moderate*
25	TNF-beta	**-**	*ND*
26	Eotaxin	**128.36**	*High*
27	GRO-alpha	**-**	*ND*
28	IL-8	**400**	*High*
29	IP-10	**218.91**	*High*
30	MCP-1	**14.06**	*Low*
31	MIP-1-alpha	**-**	*ND*
32	MIP-1-beta	**70.94**	*Moderate*
33	SDF-1-alpha	**890.44**	*High*
34	RANTES	**153.1**	*High*

Code	Label	Definition	Description
	ND	Not detected	Value was not detected in the assay
	Very Low	< Lower limit of detection (LLOD)	Value smaller than the lower limit of detection
	Low	0-30th percentile	30% of the reference samples have values less than the cutoff
	Moderate	30th-70th percentile	40% of the reference samples fall in this range
	High	> 70th percentile	Value higher than 70% of the reference samples.
	Very High	> Upper limit of detection (ULOD)	Higher than upper limit of detection

Testing has been performed in a laboratory accredited by the College of Physicians and Surgeons of Alberta (CPSA)
SKL#R028 v1.0 ; Approved: 15 March 2020

COMPARISON WITH PREVIOUS RESULTS

No.	Cytokine	01-Apr-20 Results (pg/mL)		25-Mar-20 Results (pg/mL)		Date Results (pg/mL)
1	IFN-gamma	**33.32**	*Moderate*	**24.25**	*Low*	
2	IL-12p70	**4.04**	*Very Low*	**3.3**	*Very Low*	
3	IL-13	**-**	*ND*	**-**	*ND*	
4	IL-1-beta	**4.16**	*Low*	**3.2**	*Low*	
5	IL-2	**101.87**	*High*	**71.84**	*Moderate*	
6	IL-4	**74.34**	*High*	**43.67**	*Moderate*	
7	IL-5	**105.61**	*Moderate*	**77.5**	*Low*	
8	IL-6	**150**	*High*	**120.68**	*Moderate*	
9	TNF-alpha	**56.02**	*Moderate*	**42.8**	*Moderate*	
10	GM-CSF	**-**	*ND*	**-**	*ND*	
11	IL-18	**13.45**	*Very Low*	**2.2**	*Very Low*	
12	IL-10	**6.25**	*Moderate*	**20.4**	*High*	
13	IL-17A	**65.43**	*High*	**52.4**	*Moderate*	
14	IL-21	**-**	*ND*	**-**	*ND*	
15	IL-22	**-**	*ND*	**-**	*ND*	
16	IL-23	**-**	*ND*	**-**	*ND*	
17	IL-27	**375.41**	*High*	**249.7**	*High*	
18	IL-9	**-**	*ND*	**-**	*ND*	
19	IFN-alpha	**-**	*ND*	**-**	*ND*	
20	IL-31	**10.84**	*High*	**5.2**	*High*	
21	IL-15	**72.01**	*Moderate*	**51.5**	*Moderate*	
22	IL-1-alpha	**2.48**	*Very Low*	**1.1**	*Very Low*	
23	IL-1RA	**2498.3**	*Moderate*	**1854.6**	*Moderate*	
24	IL-7	**3.06**	*Moderate*	**1.7**	*Low*	
25	TNF-beta	**-**	*ND*	**-**	*ND*	
26	Eotaxin	**128.36**	*High*	**60**	*Moderate*	
27	GRO-alpha	**-**	*ND*	**-**	*ND*	
28	IL-8	**400**	*High*	**292.3**	*Moderate*	
29	IP-10	**218.91**	*High*	**111.8**	*High*	
30	MCP-1	**14.06**	*Low*	**12.5**	*Low*	
31	MIP-1-alpha	**-**	*ND*	**-**	*ND*	
32	MIP-1-beta	**70.94**	*Moderate*	**55.68**	*Low*	
33	SDF-1-alpha	**890.44**	*High*	**550**	*High*	
34	RANTES	**153.1**	*Very High*	**135**	*High*	

COMMENT

There is a significant increase in the level of many cytokines in the current specimens when compared to the previous specimen of the patient.

METHOD

Multiplex immunoassay using Luminex xMAP (multi-analyte profiling) technology was performed on the submitted serum sample to quantitate 34 cytokine and chemokine protein targets simultaneously using Luminex instrument. The assay is based on the principle of sandwich ELISA (Enzyme Linked Immunosorbent Assay). A 5-parameter (5-P) logistic regression model was generated from the mean florescence intensity(MFI) detected by the Luminex instrument and the known standards for each analyte. Standards with a serial dilution of 1:4 were used for generating the model. Criteria of acceptance of the model are R^2 value >95%, percent recovery of each point of the standard curve < 30%, and percent CV of duplicates <30%. MFI values of the unknown samples were compared to the 5-P logistic regression curve of each cytokine to calculate the levels.

Interpretation of the results (low, moderate or high) was based on the comparison of the cytokine levels generated from 136 healthy individuals using the same cytokine panel in Hematology Translational Lab(HTL). Details of lower and upper limit of detection along with the healthy range can be provided upon request.

Test performance characteristics for this laboratory validated test has been determined by the College of Physicians and Surgeons of Alberta (CPSA) accredited laboratory.

DISCLAIMER

This report is based on the assumption that the sample received from the individual noted by the unique identifiers and has not been contaminated with that of another individual prior to receipt at the Hematology Translational Lab(HTL). It is assumed that the serum sample has been processed by following the strict guidelines recommended by HTL.

Absolute value of the cytokine levels can vary based on kit used and the lab in which the assay is performed.

Variability in the absolute value of the cytokine levels between different runs was less than 25%.

Cytokine levels of IL23, TNF-beta and IL31 were not detected in healthy individuals and therefore the interpretations for these cytokines in the analyzed samples should be considered with caution.

Results from this panel should be interpreted in the context of all clinical, biochemical, genetic and other molecular data.

REVIEW AND APPROVAL

Report Reviewed by

Clinical Scientist

Verified and Approved by

Laboratory Director

Medical Director

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