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Data Article

Cytokine data obtained from synovial stromal cells of patients with rheumatoid arthritis or osteoarthritis



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ABSTRACT

In this article, we share the raw cytokine data obtained from basal and stimulated synovial stromal cells cultured from patients with rheumatoid arthritis or osteoarthritis. This data article is related to the research article entitled “1,25D₃ and calcipotriol, its hypocalcemic analog, exert a long-lasting anti-inflammatory and anti-proliferative effect in synoviocytes cultured from patients with rheumatoid arthritis and osteoarthritis (1). Cytokine levels were analyzed by a magnetic bead-based multiplex assay (a panel of 27 important cytokines) in two separate sets of experiments. The first was conducted with IL-1 β and 1,25(OH)₂D₃ and the other with TNF α , calcipotriol, i.e. the hypocalcemic analog 1,25(OH)₂D₃, and dexamethasone. The raw data of this article display the individual variation in basal secretion of cytokines and in their response to different stimuli.

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Specifications table

Subject area	Translational science
More specific subject area	Inflammation in the synovium of rheumatoid arthritis and osteoarthritis patients
Type of data	Tables, text
How data was acquired	Cytokines were measured by the Luminex MagPix Instrument and Luminex xPotent Software and Bio-Rad Bio-Plex Pro Human Cytokine Grp I Panel (27-plex) PGE ₂ data is produced by ELISA (Thermo Scientific, USA)
Data format	raw cytokine data
Experimental factors	Basal and exposed samples from the cell culture media were collected and analyzed for cytokines.
Experimental features	Cytokine levels were analyzed by a magnetic bead-based multiplex assay (a panel of 27 important cytokines) after a 48-h treatment with different stimuli
Data source location	Oulu, Finland, 65°01'N, 025°28'E
Data accessibility	Data is with this article

Value of the data

- The raw cytokine data in this article reveal the natural variation of cytokine levels in cultured synovial stromal cells obtained from patients with rheumatoid arthritis or osteoarthritis.
- This data shows absolute cytokine levels in baseline and stimulated states (stimulated with TNF- α or IL-1 β) and when treated with anti-inflammatory factors [1,25(OH)₂D₃, calcipotriol or dexamethasone].
- By examining the individual responses to different stimuli, it is possible to evaluate the individual and overall significance of different cytokines in the synovial pathology of rheumatoid arthritis and osteoarthritis. This kind of data can help to identify the most important cytokines for further analysis by other research groups.

1. Data

See [Tables 1](#) and [2](#).

Table 1

Basal and stimulated levels of cytokines (pg/ml) after a 48-h exposure with IL-1 β (10 ng/ml) and 1,25 (OH)₂D₃ (10 nM). The apparent level of IL-1 β was mostly attributable to the added IL-1 β . Data comprises cell cultures from four patients with osteoarthritis (OA) and four with rheumatoid arthritis (RA). Cytokines have been analyzed in two separate runs which explains the slight difference in the lower detection limit. The final data is presented in Fig. 8 of the research article [\[1\]](#).

Cytokine	Patient	IL-1 β	IL-1 β + 1.25 (OH) ₂ D ₃
MIP-1 β	OA	27.5	20.7
	OA	136.7	114.21
	OA	44.2	21.1
	OA	25.3	16.3
	RA	33.21	28.61
	RA	48.6	42
	RA	74.82	92.9
	RA	< 14.7	< 14.7

Table 1 (continued)

Cytokine	Patient	IL-1 β	IL-1 β +1.25 (OH) $_2$ D $_3$
IL-6	OA	> 38026	15,859
	OA	> 100917	30,910
	OA	> 100917	16,158
	OA		
	RA	> 100917	39,876
	RA	> 100917	78,084
	RA	> 38026	27,060
	RA		
IFN- γ	OA	65.1	43.1
	OA	83.5	76.1
	OA	103.7	72.5
	OA	104.6	77.2
	RA	71.5	56.1
	RA	73.4	70.3
	RA	114.9	109.3
	RA	94.1	77.8
IL-1ra	OA	147.1	93.1
	OA	159.0	< 88.6
	OA	196.1	137.1
	OA	200.1	144.9
	RA	173.0	138.8
	RA	177.5	171.6
	RA	216.0	213.1
	RA	182.5	156.9
IL-5	OA	< 24.73	< 24.73
	OA	< 24.73	< 24.73
	OA	< 24.73	< 24.73
	OA	< 24.73	< 24.73
	RA	< 24.73	< 24.73
	RA	< 24.73	< 24.73
	RA	< 24.73	< 24.73
	RA	< 24.73	< 24.73
GM-CSF	OA	88.95	71.8
	OA	106.3	82.9
	OA	129.8	85.2
	OA	197.2	95.7
	RA	95.8	90.1
	RA	93.2	78.3
	RA	119.9	106.3
	RA	124.7	91.4
TNF- α	OA	< 79.83	< 79.83
	OA	< 79.83	< 79.83
	OA	< 79.83	< 79.83
	OA	< 79.83	< 79.83
	RA	< 79.83	148.59
	RA	< 79.83	< 79.83
	RA	< 79.83	< 79.83
	RA	< 79.83	< 79.83
RANTES	OA	167.4	135.4
	OA	2716.0	2897.0
	OA	476.0	336.6
	OA	223.5	187.5
	RA	489.4	493.9
	RA	1095	927.3
	RA	> 1267	1267
	RA	256.5	205.0
IL-2	OA	< 13.52	< 13.52
	OA	14.51	13.76
	OA	15.21	< 14.83
	OA	16.24	< 14.83
	RA	< 13.52	< 13.52

Table 1 (continued)

Cytokine	Patient	IL-1 β	IL-1 β + 1.25 (OH) $_2$ D $_3$
IL-1 β	RA	< 13.52	< 13.52
	RA	15.57	< 14.83
	RA	15.06	< 14.83
	OA	98.0	71.4
	OA	76.5	62.9
	OA	95.4	87.1
	OA	96.8	108.4
	RA	77.8	70.5
	RA	85.3	74.7
	RA	96.3	83.8
Eotaxin	RA	97.8	102.4
	OA	< 25.51	< 25.51
	OA	< 25.51	< 25.51
	OA	< 27.16	< 27.16
	OA	< 27.16	< 27.16
	RA	< 25.51	< 25.51
	RA	< 25.51	< 25.51
	RA	< 27.16	< 27.16
	RA	< 27.16	< 27.16
	RA	< 27.16	< 27.16
Basic FGF	OA	25.3	22.5
	OA	34.3	36.9
	OA	36.3	29.2
	OA	33.3	28.8
	RA	42.3	26.6
	RA	28.8	28.4
	RA	48.5	40.5
	RA	34.3	27.3
	OA	477.7	282.5
	OA	1013.0	906.3
VEGF	OA	496.4	317.9
	OA	343.8	299.6
	RA	818.2	562.6
	RA	1060.0	1032.0
	RA	1054.0	1136.0
	RA	843.2	688.5
	OA	< 29.30	< 29.30
	OA	< 29.30	< 29.30
	OA	< 28.16	< 28.16
	OA	< 28.16	< 28.16
PDGF-BB	RA	< 29.30	< 29.30
	RA	< 29.30	< 29.30
	RA	< 28.16	< 28.16
	RA	< 28.16	< 28.16
	RA	< 29.30	< 29.30
	RA	< 29.30	< 29.30
	RA	< 28.16	< 28.16
	RA	< 28.16	< 28.16
	OA	96.7	88.1
	OA	704.9	638.0
IP-10	OA	< 32.23	< 32.23
	OA	< 32.23	< 32.23
	RA	158.9	286.6
	RA	264.8	234.6
	RA	< 32.23	< 32.23
	RA	< 32.23	< 32.23
	OA	< 28.57	< 28.57
	OA	< 28.57	< 28.57
	OA	< 31.09	< 31.09
	OA	< 31.09	< 31.09
IL-13	RA	< 28.57	< 28.57
	RA	< 28.57	< 28.57
	RA	< 31.09	< 31.09
	RA	< 31.09	< 31.09
	RA	< 28.57	< 28.57
	RA	< 28.57	< 28.57
	RA	< 31.09	< 31.09
	RA	< 31.09	< 31.09
	OA	< 4.52	< 4.52
	OA	< 4.52	< 4.52

Table 1 (continued)

Cytokine	Patient	IL-1 β	IL-1 β +1.25 (OH) $_2$ D $_3$
MCP-1	OA	< 4.36	< 4.36
	OA	< 4.36	< 4.36
	RA	< 4.52	< 4.52
	RA	< 4.52	< 4.52
	RA	< 4.36	< 4.36
	RA	< 4.36	< 4.36
	OA	1997	1824
	OA	1476	1730
	OA	> 1534	> 1534
	OA	> 1534	> 1534
	RA	1463	2284
	RA	1083	1508
IL-8	RA	> 1534	> 1534
	RA	> 1534	> 1534
	OA	28,810	14,989
	OA	18,797	18,025
	OA	> 7797	> 7797
	OA	> 7797	> 7797
	RA	27,905	24,905
	RA	20,120	21,055
	RA	> 7797	> 7797
	RA	> 7797	> 7797
MIP-1 α	OA	< 16.16	< 16.16
	OA	< 16.16	< 16.16
	OA	< 1.93	< 1.93
	OA	< 1.93	< 1.93
	RA	< 16.16	< 16.16
	RA	< 16.16	< 16.16
	RA	< 1.93	< 1.93
	RA	< 1.93	< 1.93
IL-10	OA	< 33.10	< 33.10
	OA	< 33.10	< 33.10
	OA	< 32.23	< 32.23
	OA	< 32.23	< 32.23
	RA	< 33.10	< 33.10
	RA	< 33.10	< 33.10
	RA	< 32.23	< 32.23
	RA	< 32.23	< 32.23
G-CSF	OA	419.1	252.9
	OA	3701	1328
	OA	5872	3586
	OA	36,202	9641
	RA	1422	1231
	RA	1066	1155
	RA	5015	8282
	RA	2819	1270
IL-15	OA	21.3	< 20.9
	OA	39.1	39.3
	OA	38.8	29.1
	OA	50.1	29.1
	RA	33.0	25.1
	RA	35.7	32.1
	RA	57.4	52.3
	RA	43.6	22.8
IL-7	OA	< 32.96	< 32.96
	OA	< 32.96	< 32.96
	OA	< 34.29	< 34.29
	OA	< 34.29	< 34.29
	RA	< 32.96	< 32.96
	RA	< 32.96	< 32.96

Table 1 (continued)

Cytokine	Patient	IL-1 β	IL-1 β + 1.25 (OH) $_2$ D $_3$
IL-12(p70)	RA	< 34.29	< 34.29
	RA	< 34.29	< 34.29
	OA	34.2	24.1
	OA	62.3	59.7
	OA	< 35.41	< 35.41
	OA	< 35.41	< 35.41
	RA	53.2	38.4
	RA	62.6	63.2
IL-17 α	RA	59.0	60.6
	RA	45.0	40.5
	OA	49.3	37.1
	OA	64.5	60.8
	OA	65.7	47.0
	OA	70.2	49.4
	RA	57.1	46.4
	RA	57.3	57.9
IL-9	RA	73.6	72.4
	RA	56.9	47.3
	OA	< 9.16	< 9.16
	OA	< 9.16	< 9.16
	OA	< 8.09	< 8.09
	OA	< 8.09	< 8.09
	RA	< 9.16	< 9.16
	RA	< 9.16	< 9.16

Table 2

Basal and stimulated levels of cytokines (pg/ml) after a ti- > td:48-hour- > 48-h exposure with TNF- α (10 ng/ml) alone or TNF- α (10 ng/ml) with calcipotriol (10 nM) or dexamethasone (10 nM) or combination of all. The apparent increase of TNF- α was mostly attributable to the added TNF- α . Data comprises cell cultures from 2 to 6 patients with osteoarthritis (OA) or rheumatoid arthritis (RA). The final data is presented in Fig. 9 of the research article (the basal cytokine secretion not included) [1].

Cytokine	Patient	no stimulation (basal)	TNF- α	TNF- α + calcipotriol	TNF- α + dex	TNF- α + calcipotriol + dex
MIP-1 β	OA	< 13.77	47.3	34.7		
	OA	< 13.77	128.9	58.9		
	RA	< 13.77	62.8	53.5		
	RA	< 13.77	116.2	85.2		
IL-6	OA		> 2971	1511	802	456
	OA		> 2971	2247	1069	397
	OA		> 2971	2643	774	375
	OA		> 2971	2971	615	358
	OA	349.5	16,350	4046		
	OA	301.3	22,863	3164		
	RA		7829	3859	2831	1420
	RA		4473	2073	1075	585
	RA		5810	3590	2692	1387
	RA		21,968	9640	5780	3568
IFN- γ	RA	860.9	17,409	7455		
	RA	686.8	30,296	10,031		
	OA		41.2	26.5	24.0	23.3
	OA		56.7	29.4	30.7	24.0
	OA		52.7	30.5	27.3	21.8
	OA		38.2	33.8	29.1	22.1
	OA	< 21.48	57.4	36.5		
	OA	< 21.48	61.2	31.3		
	RA		67.0	40.1	40.8	31.3
	RA		51.0	36.0	33.0	27.6

Table 2 (continued)

Cytokine	Patient	no stimulation (basal)	TNF- α	TNF- α + calcipotriol	TNF- α + dex	TNF- α + calcipotriol + dex
IL-1ra	RA		66.5	36.4	36.2	21.9
	RA		88.0	55.8	57.5	41.5
	RA	< 21.48	54.4	41.6		
	RA	< 21.48	78.1	47.1		
	OA	< 88.59	147.1	93.1		
	OA	< 88.59	159.0	< 88.6		
	RA	< 88.59	148.8	110.7		
	RA	< 88.59	201.0	127.2		
IL-5	OA	< 24.73	< 24.73	< 24.73		
	OA	< 24.73	< 24.73	< 24.73		
	RA	< 24.73	< 24.73	< 24.73		
	RA	< 24.73	< 24.73	< 24.73		
GM-CSF	OA		81.2	69.3	66.9	70.8
	OA		77.6	67.2	68.5	66.0
	OA		56.3	67.4	66.5	61.1
	OA		73.1	72.1	61.1	64.1
	OA	48.19	70.7	50.6		
	OA	53.72	75.7	57.1		
	RA		79.9	68.5	70.2	69.5
	RA		88.7	67.8	68.2	70.0
	RA		83.4	71.2	72.0	59.7
	RA		92.0	75.4	76.8	74.5
TNF- α	RA	51.83	63.8	58.1		
	RA	44.88	59.7	37.3		
	OA	< 79.83	3160	2298		
	OA	< 79.83	5322	2077		
	RA	< 79.83	3421	2533		
	RA	< 79.83	3062	1598		
RANTES	OA		606.7	270.5	339.4	133.6
	OA		897.8	341.0	1267.0	363.5
	OA		1267.0	447.1	660.4	268.0
	OA		820.6	481.2	1267.0	363.8
	OA	< 24.76	3973.0	5040.0		
	OA	< 24.76	2887.0	1323.0		
	RA		302.9	180.0	371.0	160.5
	RA		1163.0	560.1	1267.0	442.3
	RA		862.4	167.8	672.7	167.9
	RA	< 24.76	3505	3080		
IL-2	RA	< 24.76	2782	2963		
	OA	< 13.52	< 13.52	< 13.52		
	OA	< 13.52	< 13.52	< 13.52		
	RA	< 13.52	< 13.52	< 13.52		
IL-1 β	RA	< 13.52	15.42	< 13.52		
	OA	< 30.49	< 30.49	< 30.49		
	OA	< 30.49	< 30.49	< 30.49		
	RA	< 30.49	< 30.49	< 30.49		
Eotaxin	RA	< 30.49	< 30.49	< 30.49		
	OA	< 25.51	< 25.51	< 25.51		
	OA	< 25.51	< 25.51	< 25.51		
	RA	< 25.51	< 25.51	< 25.51		
Basic FGF	RA	< 25.51	< 25.51	< 25.51		
	OA		33.2	20.0	18.7	17.9
	OA		30.3	24.4	22.0	19.5
	OA		25.5	19.6	18.0	17.3
	OA		23.6	21.9	19.2	17.8
	OA	< 11.22	23.2	19.5		
	OA	< 11.22	25.9	17.5		
	RA		31.9	22.5	22.6	20.9
	RA		27.8	22.6	21.05	19.8
	RA		27.0	20.3		

Table 2 (continued)

Cytokine	Patient	no stimulation (basal)	TNF- α	TNF- α + calcipotriol	TNF- α + dex	TNF- α + calcipotriol+ dex
VEGF	RA		44.1	42.0	20.5	14.3
	RA	< 11.22	24.7	20.3	28.9	23.4
	RA	< 11.22	32.5	20.8		
	OA		172.7	128.0	82.3	69.7
	OA		242.1	135.8	101.8	94.2
	OA		211.5	120.5	91.7	66.5
	OA		192.3	187.9	89.8	77.9
	OA	142.24	142.1	127.9		
	OA	127.62	175.2	117.4		
	RA		226.5	185.0	109.5	101.8
	RA		259.9	182.4	132.3	103.4
	RA		186.8	132.6	79.4	65.0
PDGF-BB	RA		337.7	208.6	133.8	124.8
	RA	171.81	203.9	159.7		
	RA	164.72	182.9	201.7		
	OA	< 29.30	< 29.30	< 29.30		
	OA	< 29.30	< 29.30	< 29.30		
	RA	< 29.30	< 29.30	< 29.30		
	RA	< 29.30	< 29.30	< 29.30		
	OA		497.2	100.8	274.3	146.1
	OA		774.1	110.8	474.5	187.5
	OA		771.6	91.9	230.8	133.7
	OA		235.0	73.2	184.6	105.4
	OA	< 33.10	1761	2238		
OA	< 33.10	789.4	132.7			
RA		275.4	85.0	196.5	123.8	
RA		1015	258.9	518.3	231.2	
RA		504.5	45.8	187.4	62.9	
RA		1727	257.2	569.4	329.8	
RA	< 33.10	1040	475.1			
RA	< 33.10	27,285	2931			
IL-13	OA	< 28.57	< 28.57	< 28.57		
OA	< 28.57	< 28.57	< 28.57			
RA	< 28.57	< 28.57	< 28.57			
RA	< 28.57	< 28.57	< 28.57			
IL-4	OA	< 4.52	< 4.52	< 4.52		
OA	< 4.52	< 4.52	< 4.52			
RA	< 4.52	< 4.52	< 4.52			
RA	< 4.52	< 4.52	< 4.52			
MCP-1	OA	243.1	1747	2170		
OA	305.76	2132	2559			
RA	290.81	1052	1368			
RA	464.9	824.7	922.6			
IL-8	OA	26.44	11,015	7844		
OA	26.73	15,848	8703			
RA	29.68	11,362	6805			
RA	36.96	9399	6496			
MIP-1 α	OA	< 16.16	< 16.16	< 16.16		
OA	< 16.16	< 16.16	< 16.16			
RA	< 16.16	< 16.16	< 16.16			
RA	< 16.16	< 16.16	< 16.16			
IL-10	OA	< 33.10	< 33.10	< 33.10		
OA	< 33.10	< 33.10	< 33.10			
RA	< 33.10	< 33.10	< 33.10			
RA	< 33.10	< 33.10	< 33.10			
G-CSF	OA	< 29.78	45.23	< 29.78		
OA	< 29.78	55.2	< 29.78			
RA	< 29.78	49.75	40.69			
RA	< 29.78	59.66	30.9			

Table 2 (continued)

Cytokine	Patient	no stimulation (basal)	TNF- α	TNF- α + calcipotriol	TNF- α + dex	TNF- α + calcipotriol + dex
IL-15	OA		40.6	25.5	35.0	29.9
	OA		50.9	33.2	48.9	36.7
	OA		57.2	38.4	44.6	34.0
	OA		42.3	22.0	43.9	29.8
	OA	< 20.96	32.4	30.3		
	OA	< 20.96	32.4	28.0		
	RA		44.8	30.0	43.0	35.5
	RA		48.3	39.4	48.9	40.5
	RA		36.4	13.5	29.4	2.9
	RA		51.6	44.8	51.1	44.2
	RA	< 20.96	31.4	30		
	RA	< 20.96	32.9	31		
IL-7	OA	< 32.96	< 32.96	< 32.96		
	OA	< 32.96	< 32.96	< 32.96		
	RA	< 32.96	< 32.96	< 32.96		
	RA	< 32.96	< 32.96	< 32.96		
IL-12 (p70)	OA	< 15.08	< 15.08	< 15.08		
	OA	< 15.08	< 15.08	< 15.08		
	RA	< 15.08	16.25	< 15.08		
	RA	20.06	15.98	15.57		
IL-17 α	OA		34.2	< 24	< 24.2	< 24.2
	OA		36.1	25.2	27.1	< 24.2
	OA		35.9	26.0	25.2	< 24.2
	OA		30.3	27.4	< 24.2	< 24.2
	OA	< 32.96	36.8	28.9		
	OA	< 32.96	45.1	24.9		
	RA		40.9	28.2	29.2	25.3
	RA		38.0	28.5	30.0	26.3
	RA		41.1	25.6	27.4	24.3
	RA		55.0	38.0	40.0	31.2
	RA	< 32.96	38.3	30.1		
	RA	< 32.96	61.2	33.0		
IL-9	OA	< 9.16	< 9.16	< 9.16		
	OA	< 9.16	< 9.16	< 9.16		
	RA	< 9.16	< 9.16	< 9.16		
	RA	< 9.16	< 9.16	< 9.16		
PGE2	OA		62	45	35	40
	OA		100	52	35	31
	OA		150	60	30	35
	OA		150	90	32	28
	RA		150	60	40	55
	RA		130	60	45	50
	RA		70	45	38	45
	RA		280	62	45	38

2. Experimental design

Two separate experiments were done: one with IL-1 β and 1,25(OH) $_2$ D $_3$ (Table 1) and the other with no stimulus, TNF- α , calcipotriol, dexamethasone and a combination of all stimuli (Table 2). PGE $_2$ analysis was done in conjunction with the latter experiment.

2.1. Reagents

1,25(OH) $_2$ D $_3$ (Sigma-Aldrich) and calcipotriol (Santa Cruz Biochemistry) were dissolved in 99% ethanol. Recombinant human IL-1 β /1F2 (R&D Systems) and dexamethasone (Sigma-Aldrich) were dissolved in sterile PBS and TNF- α (Sigma-Aldrich) in sterile PBS containing 0.1% BSA. 1,25(OH) $_2$ D $_3$ and calcipotriol were stored at -20°C and cytokines at -80°C .

2.2. Cell culture experiments with inflammatory and anti-inflammatory stimuli

Primary cell cultures were established as previously described [1]. A half of the media was changed two times every week. All analyses were conducted between the third to fifth passages. The synovial stromal cells from six patients with rheumatoid arthritis and six with osteoarthritis were grown in the complete media in four T175 flasks each containing 300,000 cells until they were 70–80% confluent. The flasks were treated either with TNF- α (10 ng/ml), with TNF- α (10 ng/ml) and calcipotriol (10 nM), or with TNF- α (10 ng/ml) and dexamethasone (10 nM) or with a combination of all three compounds for 48 h. Basal secretion of cytokines was analyzed from vehicle (absolute ethanol) treated cells. The synovial stromal cells from four patients with rheumatoid arthritis and osteoarthritis were used for IL-1 β /1,25(OH) $_2$ D $_3$ assay. Cells from each patient were cultured in two T175 bottles, one containing IL-1 β (0.5 ng/ml) and the other IL-1 β (0.5 ng/ml) and 1,25(OH) $_2$ D $_3$ (10 nM) for 48 h. The cell culture media were harvested and stored at -80°C for the cytokine analysis.

2.3. Cytokine analysis

The cytokines present in the medium were quantified with Bio-Rad Bio-Plex Pro Human Cytokine Grp I Panel (27-plex) using the Luminex MagPix Instrument and Luminex xPotent Software.

Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.dib.2017.04.041>.

Reference

- [1] J. Huhtakangas, J. Veijola, S. Turunen, A. Karjalainen, M. Valkealahti, T. Nousiainen, S. Yli-Luukko, O. Vuolteenaho, P. Lehenkari, 1,25D $_3$ and calcipotriol, its hypocalcemic analog, exert a long-lasting anti-inflammatory and anti-proliferative effect in synoviocytes cultured from patients with rheumatoid arthritis and osteoarthritis (<http://dx.doi.org/10.1016/j.jsbmb.2017.01.017>).