

**Extracorporeal Elimination of Pro- and Anti-Inflammatory Modulators by  
the Cytokine Adsorber Cytosorb® in Patients with Hyperinflammation:**

**A Prospective Study**

Helen Graf MD<sup>1,\*</sup>, Caroline Gräfe MD<sup>1,\*</sup>, Mathias Bruegel MD<sup>2</sup>, Felix L. Happich MD<sup>2</sup>,  
Vassilissa Wustrow MD<sup>1</sup>, Aljoscha Wegener MD<sup>1</sup>, Wolfgang Wilfert Mr<sup>2</sup>, Michael Zoller  
MD<sup>1</sup>, Uwe Liebchen MD<sup>1</sup>, Michael Paal MD<sup>2,§</sup>, Christina Scharf MD<sup>1,§,#</sup>

<sup>1</sup>... Department of Anesthesiology, LMU hospital, Munich, Germany.

<sup>2</sup>... Institute of Laboratory Medicine, LMU hospital, Munich, Germany.

# Corresponding author: Dr. Christina Scharf-Janßen, Department of Anesthesiology, LMU hospital,  
Marchioninistrasse 15, 81377 Munich, Germany. E-Mail: [Christina.Scharf-Janssen@med.uni-  
muenchen.de](mailto:Christina.Scharf-Janssen@med.uni-muenchen.de)

\* Shared first authorship

§ Shared last authorship

Table S1: IL-1 $\beta$  concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	30,45	16,58	36,75	29,25	46,52	39,83	39,12	36,75	37,23	38,17
2	27,21	15,71	28,05	20,16	21,87	20,16	17,58	15,96	13,96	12,7
3										
4	7,77	1,8	6,5	3,41	6,15	3,78	5,91	3,54	5,44	3,05
5										
6										
7										
8										
9	1,8	0,49	1,29	0,76	2,06	1,29	3,78	3,9	5,68	5,09
10	3,14	1,57	2,38	2,38	3,7	3,14	3,88	3,14	3,88	4,06
11	3,14	0,69	1,98	1,57	2,76	1,57	1,98	1,14		
12	5,99	0,17	5,47	0,17	4,78	1,98	4,95	2,38		
13	12,08	3,14	8,95	5,13	6,66	4,24	2,18	1,98	1,14	1,57
14	4,6	1,98	4,24	2,57	3,52	3,33	4,95	4,24		
15										

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal IL-1 $\beta$  concentration pre-Cytosorb®, post: extracorporeal IL-1 $\beta$  concentration post-Cytosorb®.

Table S2: IL-2 concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	142,6	28,6	143,2	95,8	173,5	123,7	154,7	121,3	89,3	88,8
2	59,1	17,2	48,9	32,4	39,8	38,5	33,6	34,8	31,7	23,6
3										
4	22,1	6,4	17,6	7,8	15,7	7,1	13,1	5,0	5,0	2,9
5										
6										
7										
8										
9										
10										
11										
12	38,99	3,0	36,78	10,7	24,7	12,3	21,7	13,9		
13										
14										
15										

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal IL-2 concentration pre-Cytosorb®, post: extracorporeal IL-2 concentration post-Cytosorb®.

Table S3: IL-6 concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	715108	305624	609996	553416	683028	584941	658822	689250	1,07E+06	980699
2	245136	167440	194115	147797	180775	175462	161896	154956	149498	143269
3	416	113	574	282	402	336	370	320	320	279
4	5166	1446	3357	2140	3275	2341	1633	1353	1071	948
5	274	78	210	165	225	160	201	143		
6	958	191	636	365	510	367	525	421	562	445
7	491	278	459	388	376	330	315	313	237	223
8	166	41	154	88	121	99	114	104	166	147
9	600	134	425	236	730	512	1762	1668	4179	3498
10	5770	3032	4002	3633	5023	4465	5473	5128	7527	7170
11	3491	848	2887	1660	1559	1236	979	838		
12	1826	213	1573	853	1452	1109	1650	1422		
13	365	82	439	262	552	388	571	444	455	404
14	3248	1011	2420	1667	2447	2033	3342	3178		
15	237	161	234	187	275	231	216	202	77	77

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal IL-6 concentration pre-Cytosorb®, post: extracorporeal IL-6 concentration post-Cytosorb®.

Table S4: IL-8 concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	17000	4086	18265	12819	16720	20876	11879	17785	27434	29252
2	20583	7393	22773	10401	19182	12895	14393	23455	22792	22459
3	262	43	291	119	269	164	228	144	219	168
4	3842	886	1597	1266	1546	1043	1027	693	999	766
5	125	25	105	70	118	64	73	52		
6	40	11	48	21	46	22	32	22	22	14
7	145	46	138	77	104	73	72	73	100	89
8	54	6	59	13	55	30	50	23	46	29
9	91	12	66	25	64	35	217	151	448	393
10	891	219	623	412	719	543	1097	795	1163	1144
11	443	39	276	77	270	113	182	100		
12	400	67	193	125	193	156	167	144		
13	721	113	536	242	292	260	347	208	205	158
14	322	70	271	94	254	159	560	380		
15	157	83	143	98	178	103	160	127	84	68

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal IL-8 concentration pre-Cytosorb®, post: extracorporeal IL-8 concentration post-Cytosorb®.

Table S5: IFN- $\gamma$  concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	71,12	58,46	71,63	62,33	67,49	60,78	70,6	65,68	64,91	69,56
2	65,94	56,92	63,36	61,81	74,23	64,91	70,6	63,36	77,86	69,56
3	51,53	28,39	58,72	46,66	56,66	47,94	53,58	48,96	57,69	54,35
4	80,97	33,88	57,35	54,03	61,97	46,03	45,36	29,78	25,3	30,12
5	13,31	2,41	8,18	4	5,55	4,39	7,06	3,21		
6	3,21	0,74	1,59	0,74	4	0,3	0,74	1,59	0,3	0,74
7	17,95	8,93	19,71	17,95	13,67	15,1	11,5	11,5	9,3	8,56
8	0,74	0,1	3,21	1,59	3,21	0,74	1,59	1,17	4	4,78
9										
10	36,42	12,05	33,63	23,65	38,81	36,82	44,78	39,21	38,41	43,19
11	22,85	0,3	12,05	14,05	24,05	18,46	27,65	21,66		
12	47,17	12,85	38,41	26,45	36,02	30,84	36,82	36,82		
13										
14	16,06	0,3	10,44	0,2	12,05	5,22	10,04	8,03		
15										

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal IFN- $\gamma$  concentration pre-Cytosorb®, post: extracorporeal IFN- $\gamma$  concentration post-Cytosorb®.

Table S6: TNF- $\alpha$  concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	618,8	311,5	652,4	563,9	710,8	635,6	677,5	576,6	777,0	735,7
2	614,6	376,0	519,1	400,1	499,8	478,3	430,7	417,6	400,1	356,1
3	270,9	115,7	270,9	227,4	316,0	261,8	225,0	168,8	183,0	154,5
4	601,3	419,0	491,7	462,9	467,8	409,2	338,4	317,6	364,0	364,0
5	202,4	154,7	99,9	136,0	67,9	103,3	103,3	116,6		
6	52,6	129,6	67,9	178,9	82,5	166,9	75,27	157,8	86,02	110,0
7	181,9	208,2	225,3	211,1	178,9	157,8	266,9	219,7	166,9	166,9
8	27,1	36,05	36,0	181,9	40,3	142,3	27,1	78,9	36,0	75,3
9	60,3	6,0	27,1	40,3	67,9	60,3	44,5	71,61	213,9	202,4
10	99,2	95,62	69,4	120,9	77,0	77,0	69,4	77,0	77,0	73,2
11	222,9	80,77	386,8	343,8	386,8	350,0	309,5	255,5		
12	453,2	128,0	494,8	306,4	368,5	362,3	386,8	337,6		
13	399,0	203,1	142,0	242,5	183,1	203,1	209,8	236,0	113,8	189,8
14	331,4	293,7	287,4	265,1	206,5	189,8	242,5	222,9		
15	90,9	105,6	68,3	90,9	56,8	68,3	79,7	105,6	60,63	105,6

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal TNF- $\alpha$  concentration pre-Cytosorb®, post: extracorporeal TNF- $\alpha$  concentration post-Cytosorb®.

Table S7: VEGF concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	496,8	194,3	448,1	394,0	696,5	429,3	526,2	472,7	600,0	683,5
2	686,1	367,5	613,7	514,5	717,3	583,2	632,8	523,3	520,3	466,6
3	454,3	70,5	429,3	215,6	377,5	259,8	322,6	278,8	429,3	397,2
4	472,1	176,2	383,0	313,1	360,4	272,9	318,0	188,7	288,3	182,5
5	176,2	24,6	89,3	71,2	163,3	24,6	121,4	105,9		
6	80,5	10,0	71,2	24,6	61,2	50,5	50,5	71,16	50,5	50,5
7	105,9	71,2	50,5	89,3	89,3	80,5	89,3	106,0	121,4	89,3
8	89,3	24,6	121,4	10,0	121,4	105,9	50,5	89,3	105,9	89,3
9										
10	219,8	151,3	108,5	176,0	151,3	175,9	239,8	175,9	123,8	239,8
11	258,8	123,8	277,0	239,8	311,3	239,8	219,8	249,4		
12	457,3	50,1	444,0	249,4	373,9	327,7	495,6	343,5		
13	294,5	151,3	176,0	176,0	176,0	91,8	175,9	198,7	123,8	219,8
14	285,8	151,3	230,0	187,5	239,8	163,9	239,8	239,8		
15	63,0	45,9	36,3	25,6	78,4	63,0	78,4	25,6	25,6	78,4

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal VEGF concentration pre-Cytosorb®, post: extracorporeal VEGF concentration post-Cytosorb®.

Table S8: IP-10 concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	18870	343	17444	3816	21716	9855	27021	20429	28802	27120
2	5309	543	4001	1302	4512	2476,9	4663	3006	6087	3631
3	26084	667	25821	4929	31005	10417	24989	11233	22085	13285
4	9816	367	15238	1564	25667	3032	28121	3606	21891	2636
5	2090	41	1777	179	1675	279	1467	203,01		
6	412	10	315	21	234	29	225	45,89	181	41
7	579	53	511	253	435	242	423	272	397	253
8	944	2	923	18	738	35	647	60,32	791	92
9	582	5	289	5	192	10	349	38,42	403	74
10	1596	59	916	213	1008	380	1037	515	964	628
11	5170	92	4134	499	3941	996	3817	1353		
12	20130	352	17900	2119	14998	4474	15616	7760		
13	655	11	531	31	392	40	332	65	280	101
14	3610	43	2305	107	1792	363	1935	812		
15	186	3	137	15	119	24	162	44	256	116

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal IP-10 concentration pre-Cytosorb®, post: extracorporeal IP-10 concentration post-Cytosorb®.

Table S9: MCP-1 concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	3617	3159	3563	3429	3262	3180	3501	3355	3262	3210
2	3171	2598	3203	3204	3504	3436	3559	3401	3887	3716
3	3413	1470	3367	2665	3589	2843	3364	2886	3164	2646
4	3400	2126	2761	2566	3091	2504	2608	2066	1949	1701
5	362	104	308	190	206	142	200	132		
6	93	20	89	43	64	43	55	42	40	28
7	535	312	569	481	441	403	359	331	282	280
8	212	58	219	107	176	127	240	182	320	240
9	76	23	67	39	65	49	375	329	481	431
10	983	349	862	674	1063	870	1337	1165	1066	992
11	777	193	586	473	880	652	954	786		
12	1272	350	1070	714	942	766	1015	966		
13	722	197	716	414	454	374	266	246	226	203
14	650	181	516	305	468	321	497	428		
15	46	27	41	37	51	41	73	55	94	82

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal MCP-1 concentration pre-Cytosorb®, post: extracorporeal MCP-1 concentration post-Cytosorb®.

Table S10: MIP-1a concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	47,8	5,6	55,0	32,0	62,6	42,6	40,6	36,4	76,3	71,8
2	163,6	39,1	162,0	88,2	133,8	105,7	126,4	107,3	102,7	78,6
3	51,8	9,7	51,0	27,2	43,7	33,8	42,4	33,9	44,1	45,8
4	48,9	4,0	37,1	12,2	21,0	7,0	14,1	6,5	11,2	6,5
5	10,5	1,1	6,7	3,3	7,2	4,0	7,2	3,8		
6	3,7	0,6	4,7	1,3	3,1	2,4	2,7	5,2	2,4	2,6
7	5,6	1,6	4,9	3,9	4,8	4,1	4,8	4,1	5,6	4,7
8	5,9	0,5	8,1	1,9	6,6	3,4	7,1	4,6	10,3	6,5
9	4,1	0,5	2,4	0,4	1,6	0,2	5,0	2,8	6,4	4,0
10	5,1	0,5	3,8	2,3	4,5	3,5	4,9	4,1	4,2	3,9
11	11,3	0,5	9,2	3,9	10,6	5,9	10,5	7,3		
12	32,8	2,1	30,3	9,9	25,8	15,6	25,8	19,6		
13	9,3	1,0	7,2	2,0	5,4	2,7	4,2	4,1	4,0	5,4
14	8,4	0,5	5,8	2,5	6,2	3,9	6,3	4,9		
15	2,3	0,4	1,6	1,0	2,0	1,4	3,0	2,1	3,6	3,0

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal MIP-1a concentration pre-Cytosorb®, post: extracorporeal MIP-1a concentration post-Cytosorb®.

Table S11: RANTES concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	4109	654	2912	3079	2896	2793	5099	4601	5471	5113
2	1266	688	669	566	1129	1235	486	554	469	371
3	478	357	558	809	1176	896	412	368	257	195
4	5807	2258	3052	3120	2100	2578	1058	1368	1343	1562
5	481	392	138	309	94	204	226	259		
6	132	298	192	392	214	422	168	345	207	224
7	529	838	719	741	670	571	958,11	760	414	44
8	131	161	206	578	149	418	107	285	91	195
9	210	120	118	170	196	232	163	257	731	653
10	91	222	47	327	71	140	62,32	95	79	46
11	326	112	1912	2120	2874	1923	1094	654		
12	681	230	822	754	808	1010	698	846		
13	2112	585	426	947	569	584	684	785	434	533
14	1533	843	994	986	650	567	838	741		
15	288	340	205	323	171	378	284	377	174	272

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal RANTES concentration pre-Cytosorb®, post: extracorporeal RANTES concentration post-Cytosorb®.

Table S12: ICAM concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	432664	343511	410800	381037	465117	358339	344388	283741	562712	525019
2	485717	396964	489034	457801	427749	420557	327853	386514	398882	388085
3	534772	424418	570861	524496	394853	534395	596952	544766	596713	548042
4	275024	221928	289421	245046	291281	284301	293366	285333	266816	290624
5	771153	757347	729803	717745	842771	801100	931518	842969		
6	160025	144051	149392	135945	153292	141618	150645	138314	171571	164171
7	530152	438812	533149	532929	492754	453830	468158	480716	535348	513158
8	267665	236917	301597	251503	295401	264699	307116	274274	325922	310818
9	284410	230238	238953	224471	240791	214651	245406	232558	294686	283000
10	412452	345695	364967	349283	413206	395936	419641	361739	375202	396741
11	926583	633312	778074	783417	882229	844604	891668	794529		

12	84765 1	55467 7	78271 5	65374 5	77728 7	71930 2	78253 9	63176 7		
13	20828 9	14496 3	21011 4	16273 2	23183 7	20032 4	23402 3	21250 2	28590 0	26864 1
14	28204 9	22037 1	26432 3	23131 7	25537 2	22376 5	26141 9	26045 3		
15	23219 0	25362 4	27727 5	23571 5	25561 3	24636 5	23673 8	26667 2	26074 6	30569 1

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal ICAM concentration pre-Cytosorb®, post: extracorporeal ICAM concentration post-Cytosorb®.

Table S13: VCAM concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	12159 00	11477 00	13153 00	12415 00	16311 00	94078 5	10686 00	65427 8	23370 00	20275 00
2	85448 2	64881 8	81124 7	77396 4	84635 4	83750 9	64553 5	76173 2	76235 3	69196 4
3	83442 7	64919 4	88125 0	78438 7	56488 3	82001 0	96828 3	82567 0	88789 1	85358 9
4	70406 9	59137 5	72235 7	63070 0	71958 7	71564 0	66419 7	61197 0	62968 8	64189 0
5	20576 00	19400 00	18558 00	19198 00	26677 00	23725 00	27580 00	23675 00		
6	73269 9	61678 5	63531 2	58985 9	68575 3	62070 6	69211 9	63282 0	71357 3	70974 3
7	14894 00	12282 00	14532 00	15072 00	14111 00	13207 00	13808 00	14114 00	16437 00	14177 00
8	14802 00	13735 00	17302 00	13963 00	16525 00	14889 00	14948 00	15203 00	17581 00	16066 00
9	94689 1	71367 1	83244 0	72821 4	84425 4	73589 8	80015 0	79489 9	91619 2	91160 1
10	13836 00	12903 00	13353 00	13562 00	15078 00	14909 00	15226 00	12104 00	13590 00	15382 00
11	20126 00	13678 00	12406 00	16181 00	19821 00	17902 00	21163 00	17778 00		
12	15055 00	98531 5	14408 00	12362 00	14533 00	14522 00	15013 00	13529 00		
13	80634 0	54192 9	76639 2	61340 9	85895 2	70060 4	90443 8	80877 5	83440 5	77149 6
14	12603 00	10040 00	11625 00	11131 00	12263 00	10650 00	12744 00	11594 00		
15	15101 00	15549 00	19040 00	14623 00	15316 00	16943 00	15758 00	15584 00	18085 00	21742 00

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal VCAM concentration pre-Cytosorb®, post: extracorporeal VCAM concentration post-Cytosorb®.



Table S14: IL-4 concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	23,25	18,2	24,94	19,1	24,52	20,43	23,36	21,31	23,04	26,71
2	25,78	17,52	25,99	20,87	25,78	22,71	24,1	21,53	24,1	21,74
3	7,02	0,1	6,73	1,47	6	3,49	7,02	3,32	5,55	5,1
4	10,34	3,62	7,13	4,71	7,98	4,44	4,97	3,2	3,9	2,77
5	1,22	0,87	0,69	0,49	0,87	0,49	0,87	0,49		
6	1,55	0,49	1,55	0,87	1,22	0,87	0,87	1,38	0,69	1,22
7										
8										
9										
10	9,35	5,51	7,62	6,71	9,76	8,06	9,35	8,5	11,37	10,17
11	9,56	2,44	7,17	5,25	4,74	4,21	3,07	2,44		
12	9,76	0,97	8,93	3,07	8,5	3,93	8,06	5,75		
13	2,44	0,97	1,76	0,97	1,76	0,3	1,76	2,44	0,97	1,39
14	6,71	2,44	5	3,07	4,74	4,21	7,17	6,24		
15										

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal IL-4 concentration pre-Cytosorb®, post: extracorporeal IL-4 concentration post-Cytosorb®.

Table S15: IL-5 concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	601,9	541,1	692,0	711,9	942,3	731,7	756,5	726,8	766,3	672,1
2	751,5	530,9	530,9	464,3	869,4	571,5	530,9	576,6	662,1	596,8
3	219,9	3,9	354,7	135,3	158,2	158,3	241,9	214,3	197,7	236,4
4	411,9	146,9	342,6	236,1	382,3	266,9	287,2	162,9	210,2	225,8
5	81,0	1,0	58,2	34,5	69,7	34,5	69,7	34,5		
6	75,4	28,4	81,0	58,2	40,5	46,5	69,7	46,5	40,5	34,5
7	81,0	40,5	69,7	69,7	69,7	46,5	52,3	34,5	34,5	46,4
8	46,5	9,1	58,2	2,0	34,5	9,1	22,1	34,5	46,5	9,1
9	52,3	9,1	40,5	22,1	58,2	15,8	114,4	103,4	189,3	205,0
10	343,3	245,8	282,2	326,2	334,8	264,2	334,8	334,8	426,6	450,8
11	264,2	28,9	245,8	127,1	188,7	148,3	198,5	81,8		
12	351,9	28,9	368,8	188,7	300,0	188,7	317,5	282,2		
13	105,1	69,6	81,8	81,8	81,8	81,8	81,8	81,8	93,6	93,6
14	227,2	116,2	245,8	69,6	227,2	227,2	264,2	264,2		
15										

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal IL-5 concentration pre-Cytosorb®, post: extracorporeal IL-5 concentration post-Cytosorb®.

Table S16: IL-10 concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	348	118	388	275	453	346	234	191	235	235
2	1243	752	908	652	695	643	808	662	720	528
3	259	58	232	132	195	132	164	112	138	110
4	69	20	36	22	26	15	26	20	40	26
5	20	5	13	5	9	7	24	13		
6										
7	24	13	22	19	17	13	15	13	13	12
8	54	7	69	24	21	7	9	5	13	7
9	52	9	22	9	20	11	55	42	93	70
10	73	25	39	32	55	41	73	60	63	52
11	161	30	125	69	121	83	105	73		
12	2487	452	2295	1312	1930	1571	1587	1420		
13	149	34	105	60	73	43	45	39	36	32
14	65	12	52	25	35	25	48	40		
15	51	18	35	25	27	17	29	25	23	21

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal IL-10 concentration pre-Cytosorb®, post: extracorporeal IL-10 concentration post-Cytosorb®.

Table S17: FGF-basic concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	97,2	77,2	107,6	91,6	114,5	100,5	119,1	102,0	112,2	124,3
2	113,0	75,5	111,4	95,6	105,2	103,6	102,8	94,0	98,9	87,4
3	59,2	8,8	57,3	20,5	55,4	31,5	57,3	34,9	53,5	49,6
4	57,2	33,3	53,1	33,3	57,2	33,3	44,7	30,8	40,3	27,0
5										
6										
7										
8										
9										
10	42,6	30,6	33,8	33,8	36,8	41,2	42,6	42,6	48,1	45,4
11	36,8	16,5	36,8	27,4	36,8	27,4	33,8	27,4		
12	63,4	1,0	63,4	24,0	45,4	30,6	54,7	36,8		
13	22,2	1,0	16,5	16,5	20,4	24,0	20,4	20,4	16,5	20,4
14	32,2	22,2	33,8	27,4	27,4	20,4	33,8	24,0		
15										

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal FGF-basic concentration pre-Cytosorb®, post: extracorporeal FGF-basic concentration post-Cytosorb®.

Table S18: PDGF concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	611,0	122,3	520,8	546,0	516,6	646,7	1398,2	1136,8	1515,3	1268,5
2	167,5	41,1	128,5	61,3	124,4	118,3	97,8	118,3	142,8	89,7
3	57,2	5,4	77,5	83,6	171,6	114,2	65,3	53,2	61,3	13,2
4	623,6	195,6	362,4	317,7	216,7	239,6	108,9	110,6	81,6	126,1
5										
6										
7	48,0	54,7	71,5	68,1	48,0	58,1	71,5	68,1	41,4	38,1
8										
9	34,8	2,9	10,6	0,1	2,9	2,9	17,0	9,1	88,4	78,2
10	45,3	20,7	26,9	61,7	33,1	41,3	41,3	45,4	41,3	24,8
11	69,8	33,1	210,0	243,7	241,8	162,2	81,9	53,5		
12	98,1	12,4	98,1	81,9	86,0	88,0	86,0	73,8		
13	90,0	14,5	37,2	57,6	37,2	29,0	16,5	37,2	33,1	37,2
14	94,0	61,7	61,7	59,6	49,4	41,3	61,7	65,7		
15	56,5	49,2	34,7	71,1	29,9	83,4	51,6	113,0	37,1	34,7

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal PDGF concentration pre-Cytosorb®, post: extracorporeal PDGF concentration post-Cytosorb®.

Table S19: GM-CSF concentration (pg/ml) pre- and post-Cytosorb® at different timepoints

Patient	D1 pre	D1 post	D2 pre	D2 post	D3 pre	D3 post	D4 pre	D4 post	D5 pre	D5 post
1	43,88	18,76	47,89	38,74	82,79	63,66	80,68	72,49	125,19	118,69
2	18,3	9,16	19,96	13,79	17,84	15,99	17,23	14,42	12,17	10,52
3	1,93	0,05	4,43	0,1	3,22	0,1	2,8	0,1	1,93	0,97
4	7,16	0,21	7,16	1,98	5,56	2,47	4,73	1,45	2,47	0,21
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

Note: D1: ten minutes after initiation of Cytosorb®, D2: one hour after initiation of Cytosorb®, D3: three hours after initiation of Cytosorb®, D4: six hours after initiation of Cytosorb®, D5: twelve hours after initiation of Cytosorb®, pre: extracorporeal GM-CSF concentration pre-Cytosorb®, post: extracorporeal GM-CSF concentration post-Cytosorb®.