

Table 1. Types of publications of cytokine literature between 1980 and 2018^a

Document Type	Number	% ^a
Original article	191,953	82.523
Review	18,675	8.029
Meeting abstract	16,224	6.975
Proceeding paper	9,699	4.169
Editorial material	1,815	0.78
Book chapter	1,603	0.689
Letter	824	0.354
Note	741	0.319
Correction	350	0.15
Retracted publication	123	0.053
News	63	0.027
Book	6	0.003
Biographical item	2	0.001
Book review	2	0.001
Total	232,606	100

^aTotal percentage may exceed 100%; certain items were included in more than one category.

Table 2. The first 10 research areas by publications in cytokine literature between 1980 and 2018

Research Areas	Number of publications	%
Immunology	66,098	28.416
Molecular Biology	28,043	12.056
Cell Biology	25,824	11.102
Medicine	16,077	6.912
Oncology	15,112	6.497
Pharmacology	14,454	6.214
Hematology	13,081	5.624
Neurosciences	12,242	5.263
Endocrinology	7,944	3.415
Surgery	7,683	3.303

Table 3. The top ten authors by record count in cytokine literature between 1980 and 2018

Author	Institution	Country	Record Count	%
Zhang Y	Shanghai Jiaotong University	China	832	0.358
Wang Y	Shengjing Hospital of China Medical University	China	831	0.357
Li Y	The First Affiliated Hospital of China Medical University	China	729	0.313
Liu Y	China Agricultural University	China	699	0.301
Li J	Capital Medical University	China	676	0.291
Wang J	Tianjin First Central Hospital	China	603	0.259
Zhang J	Mingzhou Hospital of Zhejiang University	China	584	0.251
Zhang L	Shanghai Medical College of Fudan University	China	570	0.245
Wang L	The Second Hospital of Jilin University	China	527	0.227
Wang H	China Medical University	China	507	0.218

Table 4. The top ten institutions by number of publications in cytokine literature

Organizations	Country	Document number	%
Harvard University	USA	4741	2.038
University of Pittsburgh	USA	2360	1.015
University of Michigan	USA	2192	0.942
National Cancer Institute	USA	2166	0.931
University of Pennsylvania	USA	2133	0.917
University of Texas	USA	2008	0.863
University of Tokyo	Japan	1972	0.848
University of California	USA	1892	0.813
National Institute of Allergy and Infectious Diseases	USA	1799	0.773
University of Washington	USA	1706	0.733

Table 5. The top ten source title of cytokine literature according to the number of published documents

Journal Name	Number of Publications	%
Journal of Immunology	9633	4.141
PLOS One	5018	2.157
Blood	3342	1.437
Journal of Biological Chemistry	3144	1.352
Cytokine	2736	1.176
Infection and Immunity	2299	0.988
European Journal of Immunology	2104	0.905
FASEB Journal	1907	0.820
Journal of Allergy and Clinical Immunology	1848	0.794
Journal of Leukocyte Biology	1768	0.760

Table 6. The 20 most cited manuscripts in the cytokine literature between 1980 and 2018

Article	Author	Journal Name	Total Citation	Year
Bcl-2 Heterodimerizes In-Vivo with A Conserved Homolog, Bax, That Accelerates Programmed Cell-Death	Oltvai, ZN; Milliman, CL; Korsmeyer, SJ	Cell	4945	1993
A Toll-like receptor recognizes bacterial DNA	Hemmi, H; Takeuchi, O; Kawai, T; <i>et al.</i>	Nature	4464	2000
Interleukin-10 and the interleukin-10 receptor	Moore, KW; Malefyt, RD; Coffman, RL; <i>et al.</i>	Annual Review of Immunology	4286	2001
Inflammation and cancer: back to Virchow?	Balkwill, F; Mantovani, A	Lancet	4278	2001
Recognition of double-stranded RNA and activation of NF-kappa B by Toll-like receptor 3	Alexopoulou, L; Holt, AC; Medzhitov, R; <i>et al.</i>	Nature	3964	2001
Osteoprotegerin ligand is a cytokine that regulates osteoclast differentiation and activation	Lacey, DL; Timms, E; Tan, HL; <i>et al.</i>	Cell	3798	1998
Functional diversity of helper T lymphocytes	Abbas, AK; Murphy, KM; Sher, A	Nature	3487	1996
Biologic basis for interleukin-1 in disease	Dinarello, CA	Blood	3300	1996
Interleukin-10-Deficient Mice Develop Chronic Enterocolitis	Kuhn, R; Lohler, J; Rennick, D; <i>et al.</i>	Cell	3159	1993
How cells respond to interferons	Stark, GR; Kerr, IM; Williams, BRG; <i>et al.</i>	Annual Review of Biochemistry	3068	1998
Interleukin 17-producing CD4(+) effector T cells develop via a lineage distinct from the T helper type 1 and 2 lineages	Harrington, LE; Hatton, RD; Mangan, PR; <i>et al.</i>	Nature Immunology	2999	2005
The orphan nuclear receptor ROR gamma t directs the differentiation program of proinflammatory IL-17(+) T helper cells	Ivanov, Ivaylo I.; McKenzie, Brent S.; Zhou, Liang; <i>et al.</i>	Cell	2952	2006
A Protein-Kinase Involved in the Regulation of Inflammatory Cytokine Biosynthesis	Lee, JC; Laydon, JT; McDonnell, PC; <i>et al.</i>	Nature	2928	1994
STATs and gene regulation	Darnell, JE	Science	2892	1997
Inflammation and Alzheimer's disease	Akiyama, H; Barger, S; Barnum, S; <i>et al.</i>	Neurobiology of Aging	2864	2000
The expanding universe of T-cell subsets: Th1, Th2 and more	Mosmann, TR; Sad, S	Immunology Today	2846	1996
IL-17 and Th17 Cells	Korn, Thomas; Bettelli, Estelle; Oukka, Mohamed; <i>et al.</i>	Annual Review of Immunology	2810	2009
A Cell Initiating Human Acute Myeloid-Leukemia After Transplantation into SCID Mice	Lapidot, T; Sirard, C; Vormoor, J; <i>et al.</i>	Nature	2765	1994
Development of Th1 CD4+ T-Cells Through IL-12 Produced by Listeria-Induced Macrophages	Hsieh, CS; Macatonia, SE; Tripp, CS; <i>et al.</i>	Science	2737	1993
Vascular endothelial growth factor (VEGF) and its receptors	Neufeld, G; Cohen, T; Gengrinovitch, S; <i>et al.</i>	FASEB Journal	2707	1999

Table 7. The 20 most used keywords in cytokine literature between 1980 and 2018

Rank	Keyword	Total link strength	Occurrences (per 100,000 items)
1	Cytokine(s)	8861	3860
2	Inflammation	6053	2534
3	Apoptosis	2013	904
4	Macrophage(s)	1833	715
5	IL-6	1706	615
6	TNF- α	1665	653
7	NF- κ B	1624	656
8	Asthma	1596	677
9	Microglia	1528	551
10	Oxidative stress	1506	639
11	Dendritic cell(s)	1332	611
12	Neuroinflammation	1288	511
13	Cancer	1203	444
14	IL-10	1199	448
15	T cell(s)	1194	445
16	Lipopolysaccharide	1101	474
17	Chemokine(s)	1100	384
18	Rheumatoid arthritis	1073	505
19	Sepsis	1052	461
20	IL-1 β	983	339