



Bibliometric Analysis

for the U.S. Environmental Protection Agency/Office of Research and Development's Human Health Research Program

This is a bibliometric analysis of the papers prepared by intramural and extramural researchers of the U.S. Environmental Protection Agency (EPA) of the Human Health Research Program. For this analysis, 1,835 papers were reviewed, and they were published from 1997 to 2006. These publications were cited 22,937 times in the journals covered by Thomson's *Web of Science*¹ and Scopus². Of these 1,835 publications, 1,561 (85%) have been cited at least once in a journal.

Searches of Thomson Scientific's *Web of Science* and Scopus were conducted to obtain times cited data for the human health journal publications. The analysis was completed using Thomson's *Essential Science Indicators (ESI)* and *Journal Citation Reports (JCR)* as benchmarks. *ESI* provides access to a unique and comprehensive compilation of essential science performance statistics and science trends data derived from Thomson's databases. For influence and impact measures, *ESI* employs both total citation counts by field and cites per paper scores. The former reveals gross influence while the latter shows weighted influence, also called impact. *JCR* is a recognized authority for evaluating journals. It presents quantifiable statistical data that provide a systematic, objective way to evaluate the world's leading journals and their impact and influence in the global research community. The two key measures used in this analysis to assess the journals in which the EPA human health papers are published are the Impact Factor and Immediacy Index. The Impact Factor is a measure of the frequency with which the "average article" in a journal has been cited in a particular year. The Impact Factor helps evaluate a journal's relative importance, especially when compared to other journals in the same field. The Immediacy Index is a measure of how quickly the "average article" in a journal is cited. This index indicates how often articles published in a journal are cited within the same year and it is useful in comparing how quickly journals are cited.

The report includes a summary of the results of the analysis, an analysis of the 1,835 human health papers analyzed by *ESI* field (e.g., clinical medicine, environment/ecology, plant & animal science), an analysis of the journals in which the human health papers were published, a table of the highly cited researchers in the Human Health Research Program, and a list of the patents and patent applications resulting from the program.

¹ Thomson Scientific's *Web of Science* provides access to current and retrospective multidisciplinary information from approximately 8,830 of the most prestigious, high impact research journals in the world. *Web of Science* also provides cited reference searching.

² Scopus is a large abstract and citation database of research literature and quality Web sources designed to support the literature research process. Scopus offers access to 15,000 titles from 4,000 different publishers, more than 12,850 academic journals (including coverage of 535 Open Access journals, 750 conference proceedings, and 600 trade publications), 27 million abstracts, 245 million references, 200 million scientific Web pages, and 13 million patent records.

SUMMARY OF RESULTS

- 1. One-quarter of the human health publications are highly cited papers.** A review of the citations indicates that 462 (25%) of the human health papers qualify as highly cited when using the *ESI* criteria for the top 10% of highly cited publications. This is 2.5 times the number expected. Sixty-four (3.5%) of the human health papers qualify as highly cited when using the *ESI* criteria for the top 1%, which is 3.5 times the number expected. Six (0.33%) of these papers qualify as very highly cited when using the criteria for the top 0.1%, which is 3.3 times the number anticipated. As expected, no papers actually meet the 0.01% threshold for the most highly cited papers (the expected number for this size program is 0.18 papers in the most highly cited category).
- 2. The human health papers are more highly cited than the average paper.** Using the *ESI* average citation rates for papers published by field as the benchmark, in 16 of the 21 fields in which the EPA human health papers were published, the ratio of actual to expected cites is greater than 1, indicating that the human health papers are more highly cited than the average papers in those fields. For all 16 fields combined, the ratio of total number of cites to the total number of expected cites (22,937 to 13,742.39) is 1.67, indicating that the human health papers are more highly cited than the average paper.
- 3. More than half of the human health papers are published in high impact journals.** Nine hundred thirty-two (932) of the 1,835 papers were published in the top 10% of journals ranked by *JCR* Impact Factor, representing 51% of EPA's human health papers. This number is more than 5 times higher than expected. Nine hundred thirty-eight (938) of the 1,835 papers appear in the top 10% of journals ranked by *JCR* Immediacy Index, representing 51% of EPA's human health papers. This number is also more than 5 times higher than expected.
- 4. Fifteen of the human health papers qualify as hot papers.** Using the hot paper thresholds established by *ESI* as a benchmark, 15 hot papers, representing 0.8% of the human health papers, were identified in the analysis. Hot papers are papers that were highly cited shortly after they were published. The number of human health hot papers is 8 times higher than expected.
- 5. The authors of the human health papers cite themselves much less than the average author.** Nine hundred ninety-two (992) of the 22,937 cites are author self-cites. This 4.3% author self-citation rate is well below the accepted range of 10-30% author self-citation rate.
- 6. Eighty-one of the authors of the human health papers are included in *ISI Highly Cited.com*,** which is a database of the world's most influential researchers who have made key contributions to science and technology during the period from 1981 to 1999.

Highly Cited Human Health Publications

The 1,835 human health papers reviewed for this analysis covered 21 of the 22 *ESI* fields. The distribution of the papers among these 21 fields and the number of citations by field are presented in Table 1.

Table 1. Human Health Papers by *ESI* Fields

No. of Citations	<i>ESI</i> Field	No. of EPA HH Papers	Average Cites/Paper
6,313	Clinical Medicine	469	13.46
5,809	Pharmacology & Toxicology	472	12.31
5,706	Environment/Ecology	424	13.46
1,107	Molecular Biology & Genetics	78	14.19
920	Biology & Biochemistry	76	12.10
824	Immunology	29	28.41
757	Neuroscience & Behavior	91	8.32
225	Chemistry	40	5.62
212	Engineering	33	6.42
186	Multidisciplinary	11	16.91
183	Geosciences	14	13.07
176	Microbiology	16	11.00
146	Social Sciences, General	38	3.84
134	Agricultural Sciences	12	11.17
82	Mathematics	6	13.67
62	Plant & Animal Science	11	5.64
61	Psychiatry/Psychology	6	10.17
24	Computer Science	4	6.00
7	Economics & Business	2	3.50
2	Physics	1	2.00
1	Material Sciences	2	0.50
Total = 22,937		Total = 1,835	12.50

There are 462 (25.2% of the papers analyzed) highly cited EPA human health papers in 18 of the 21 fields—Clinical Medicine, Environment/Ecology, Pharmacology & Toxicology, Immunology, Molecular Biology & Genetics, Biology & Biochemistry, Engineering, Multidisciplinary, Geosciences, Neuroscience & Behavior, Social Sciences, General, Chemistry, Agricultural Sciences, Mathematics, Psychiatry/Psychology, Microbiology, Computer Science, and Plant & Animal Science—when using the *ESI* criteria for the **top 10% of papers**. Table 2 shows the number of EPA papers in those 18 fields that meet the **top 10% threshold in *ESI***. Sixty-four (3.5%) of the papers analyzed qualify as highly cited when using the *ESI* criteria for the **top 1% of papers**. These papers cover 10 fields—Environment/Ecology, Pharmacology & Toxicology, Clinical Medicine, Molecular Biology & Genetics, Immunology, Multidisciplinary, Agricultural Sciences, Engineering, Biology & Biochemistry, and Plant & Animal Science. Table 3 shows the 64 papers by field that meet the **top 1% threshold in *ESI***. The citations for these 64 papers are provided in Tables 4 through 13. There were 6 (0.33%) very highly cited human health paper in the fields of Environment/Ecology, Clinical Medicine, and Plant & Animal Science. These papers, which met the **top 0.1% threshold in *ESI***, are listed in Table 14. None of the human health papers actually met the **top 0.01% threshold in *ESI***, which is to be expected.

Table 2. Number of Highly Cited Human Health Papers by Field (top 10%)

Citations	<i>ESI</i> Field	No. of Papers	Average Cites/Paper	% of EPA Papers in Field
4,049	Clinical Medicine	125	32.39	26.65%
3,939	Environment/Ecology	140	28.14	33.02%
3,626	Pharmacology & Toxicology	117	30.99	24.79%
576	Immunology	5	115.20	17.24%
575	Molecular Biology & Genetics	3	191.67	3.85%
410	Biology & Biochemistry	13	31.54	17.11%
182	Engineering	12	15.17	36.36%
159	Multidisciplinary	5	31.80	45.45%
143	Geosciences	5	28.60	35.71%
110	Neuroscience & Behavior	4	27.50	4.40%
108	Social Sciences, General	11	9.82	28.95%
107	Chemistry	7	15.28	17.50%
105	Agricultural Sciences	3	35.00	25.00%
80	Mathematics	5	16.00	83.33%
44	Psychiatry/Psychology	2	22.00	33.33%
21	Microbiology	1	21.00	6.25%
20	Computer Science	2	10.00	50.00%

Citations	ESI Field	No. of Papers	Average Cites/Paper	% of EPA Papers in Field
20	Plant & Animal Science	2	10.00	18.18%
Total = 14,274		Total = 462	30.90	25.18%

Table 3. Number of Highly Cited Human Health Papers by Field (top 1%)

Citations	ESI Field	No. of Papers	Average Cites/Paper	% of EPA Papers in Field
1,342	Environment/Ecology	30	44.73	7.08%
1,096	Pharmacology & Toxicology	16	68.50	3.39%
805	Clinical Medicine	11	73.18	2.35%
473	Molecular Biology & Genetics	1	473.00	1.28%
356	Immunology	1	356.00	3.45%
79	Multidisciplinary	1	79.00	9.09%
78	Agricultural Sciences	1	78.00	8.33%
37	Engineering	1	37.00	3.03%
19	Biology & Biochemistry	1	19.00	1.32%
6	Plant & Animal Science	1	6.00	9.09%
Total = 4,291		Total = 64	67.05	3.49%

Table 4. Highly Cited Human Health Papers in the Field of Environment/Ecology (top 1%)

No. of Cites	First Author	Paper
104	Eskenazi B	Exposures of children to organophosphate pesticides and their potential adverse health effects. <i>Environmental Health Perspectives</i> 1999; 107(Suppl 3):409-419.
100	Landrigan PJ	Pesticides and inner-city children: exposures, risks, and prevention. <i>Environmental Health Perspectives</i> 1999;107(Suppl 3):431-437.
192	Rice D	Critical periods of vulnerability for the developing nervous system: Evidence from humans and animal models. <i>Environmental Health Perspectives</i> 2000;108(Suppl 3):511-533.

No. of Cites	First Author	Paper
175	Laden F	Association of fine particulate matter from different sources with daily mortality in six US cities. <i>Environmental Health Perspectives</i> 2000;108(10):941-947.
54	Lioy PJ	Characterization of the dust/smoke aerosol that settled east of the World Trade Center (WTC) in Lower Manhattan after the collapse of the WTC 11 September 2001. <i>Environmental Health Perspectives</i> 2002;110(7):703-714.
68	Schechter A	Polybrominated diphenyl ethers (PBDEs) in US mothers' milk. <i>Environmental Health Perspectives</i> 2003;111(14):1723-1729.
55	Birnbaum LS	Cancer and developmental exposure to endocrine disruptors. <i>Environmental Health Perspectives</i> 2003;111(4):389-394.
53	Perera FP	Effects of transplacental exposure to environmental pollutants on birth outcomes in a multiethnic population. <i>Environmental Health Perspectives</i> 2003;111(2):201-205.
45	Longnecker MP	Comparison of polychlorinated biphenyl levels across studies of human neurodevelopment. <i>Environmental Health Perspectives</i> 2003;111(1):65-70.
38	Curl CL	Organophosphorus pesticide exposure of urban and suburban preschool children with organic and conventional diets. <i>Environmental Health Perspectives</i> 2003;111(3):377-382.
37	Berkowitz GS	Exposure to indoor pesticides during pregnancy in a multiethnic, urban cohort. <i>Environmental Health Perspectives</i> 2003;111(1):79-84.
37	Whyatt RM	Contemporary-use pesticides in personal air samples during pregnancy and blood samples at delivery among urban minority mothers and newborns. <i>Environmental Health Perspectives</i> 2003;111(5):749-756.
78	Birnbaum LS	Brominated flame retardants: Cause for concern? <i>Environmental Health Perspectives</i> 2004;112(1):9-17.
40	Berkowitz GS	<i>In utero</i> pesticide exposure, maternal paraoxonase activity, and head circumference. <i>Environmental Health Perspectives</i> 2004;112(3):388-391.
35	Whyatt RM	Prenatal insecticide exposures and birth weight and length among an urban minority cohort. <i>Environmental Health Perspectives</i> 2004;112(10):1125-1132.
32	Eskenazi B	Association of <i>in utero</i> organophosphate pesticide exposure and fetal growth and length of gestation in an agricultural population. <i>Environmental Health Perspectives</i> 2004;112(10):1116-1124.
25	Ulrich RG	Overview of an interlaboratory collaboration on evaluating the effects of model hepatotoxicants on hepatic gene expression. <i>Environmental Health Perspectives</i> 2004;112(4):423-427.

Bibliometric Analysis of Human Health Research Program Journal Articles

No. of Cites	First Author	Paper
24	Landrigan PJ	Health and environmental consequences of the World Trade Center disaster. <i>Environmental Health Perspectives</i> 2004;112(6):731-739.
25	Kunzli N	Ambient air pollution and atherosclerosis in Los Angeles. <i>Environmental Health Perspectives</i> 2005;113(2):201-206.
18	Stapleton HM	Polybrominated diphenyl ethers in house dust and clothes dryer lint. <i>Environmental Science & Technology</i> 2005;39(4):925-931.
16	Lanphear BP	Low-level environmental lead exposure and children's intellectual function: An international pooled analysis. <i>Environmental Health Perspectives</i> 2005;113(7):894-899.
16	Shafer TJ	Developmental neurotoxicity of pyrethroid insecticides: Critical review and future research needs. <i>Environmental Health Perspectives</i> 2005;113(2):123-136.
16	Yolton K	Exposure to environmental tobacco smoke and cognitive abilities among US children and adolescents. <i>Environmental Health Perspectives</i> 2005;113(1):98-103.
14	Trasande L	Public health and economic consequences of methyl mercury toxicity to the developing brain. <i>Environmental Health Perspectives</i> 2005;113(5):590-596.
11	Sapkota A	Impact of the 2002 Canadian forest fires on particulate matter air quality in Baltimore City. <i>Environmental Science & Technology</i> 2005;39(1):24-32.
10	Merchant JA	Asthma and farm exposures in a cohort of rural Iowa children. <i>Environmental Health Perspectives</i> 2005;113(3):350-356.
10	Kissel JC	Comparison of organophosphorus pesticide metabolite levels in single and multiple daily urine samples collected from preschool children in Washington State. <i>Journal of Exposure Analysis and Environmental Epidemiology</i> 2005;15(2):164-171.
6	Lu CS	Organic diets significantly lower children's dietary exposure to organophosphorus pesticides. <i>Environmental Health Perspectives</i> 2006;114(2):260-263.
5	Calderon RL	Estimates of endemic waterborne risks from community-intervention studies. <i>Journal of Water and Health</i> 2006;4(Suppl 2):89-100.
3	Selgrade MK	Induction of asthma and the environment: What we know and need to know. <i>Environmental Health Perspectives</i> 2006;114(4):615-619.

Table 5. Highly Cited Human Health Papers in the Field of Pharmacology & Toxicology (top 1%)

No. of Cites	First Author	Paper
153	Laws SC	Estrogenic activity of octylphenol, nonylphenol, bisphenol A and methoxychlor in rats. <i>Toxicological Sciences</i> 2000;54(1):154-167.
166	Styblo M	Comparative toxicity of trivalent and pentavalent inorganic and methylated arsenicals in rat and human cells. <i>Archives of Toxicology</i> 2000;74(6):289-299.
107	Lang T	Extensive genetic polymorphism in the human CYP2B6 gene with impact on expression and function in human liver. <i>Pharmacogenetics</i> 2001;11(5):399-415.
120	Thomas DJ	The cellular metabolism and systemic toxicity of arsenic. <i>Toxicology and Applied Pharmacology</i> 2001;176(2):127-144.
143	Mass MJ	Methylated trivalent arsenic species are genotoxic. <i>Chemical Research in Toxicology</i> 2001;14(4):355-361.
169	Kitchin KT	Recent advances in arsenic carcinogenesis: Modes of action, animal model systems, and methylated arsenic metabolites. <i>Toxicology and Applied Pharmacology</i> 2001;172(3):249-261.
94	Hughes MF	Arsenic toxicity and potential mechanisms of action. <i>Toxicology Letters</i> 2002;133(1):1-16.
108	Ding XX	Human extrahepatic cytochromes P450: Function in xenobiotic metabolism and tissue-selective chemical toxicity in the respiratory and gastrointestinal tracts. <i>Annual Review of Pharmacology and Toxicology</i> 2003;43:149-173.
14	Costa LG	Modulation of paraoxonase (PON1) activity. <i>Biochemical Pharmacology</i> 2005;69(4):541-550.
3	Barton HA	The acquisition and application of absorption, distribution, metabolism and excretion (ADME) data in agricultural chemical safety assessments. <i>Critical Reviews in Toxicology</i> 2006;36(1):9-35.
4	Furlong CE	PON1 status of farmworker mothers and children as a predictor of organophosphate sensitivity. <i>Pharmacogenetics and Genomics</i> 2006;16(3):183-190.
3	Cooper RL	A tiered approach to life stages testing for agricultural chemical safety assessment. <i>Critical Reviews in Toxicology</i> 2006;36(1):69-98.
3	Haws LC	Development of a refined database of mammalian relative potency estimates for dioxin-like compounds. <i>Toxicological Sciences</i> 2006;89(1):4-30.
3	Calafat AM	Urinary and amniotic fluid levels of phthalate monoesters in rats after the oral administration of di(2-ethylhexyl) phthalate and di-n-butyl phthalate. <i>Toxicology</i> 2006;217(1):22-30.

No. of Cites	First Author	Paper
3	Carmichael MG	Agricultural chemical safety assessment: a multisector approach to the modernization of human safety requirements. <i>Critical Reviews in Toxicology</i> 2006;36(1):1-7.
3	Delker D	Molecular biomarkers of oxidative stress associated with bromate carcinogenicity. <i>Toxicology</i> 2006;221(2-3):158-165.

Table 6. Highly Cited Human Health Papers in the Field of Clinical Medicine (top 1%)

No. of Cites	First Author	Paper
144	Pope CN	Organophosphorus pesticides: do they all have the same mechanism of toxicity? <i>Journal of Toxicology and Environmental Health-Part B-Critical Reviews</i> 1999;2(2):161-181.
125	McConnell R	Asthma in exercising children exposed to ozone: a cohort study. <i>Lancet</i> 2002;359(9304):386-391.
97	Cho HY	Role of NRF2 in protection against hyperoxic lung injury in mice. <i>American Journal of Respiratory Cell and Molecular Biology</i> 2002;26(2):175-182.
205	Canfield RL	Intellectual impairment in children with blood lead concentrations below 10 µg per deciliter. <i>New England Journal of Medicine</i> 2003;348(16):1571-1526.
87	Pope CA	Cardiovascular mortality and long-term exposure to particulate air pollution - epidemiological evidence of general pathophysiological pathways of disease. <i>Circulation</i> 2004;109(1):71-77.
48	Gauderman WJ	The effect of air pollution on lung development from 10 to 18 years of age. <i>New England Journal of Medicine</i> 2004;351(11):1057-1067.
47	Gilliland FD	Effect of glutathione-S-transferase M1 and P1 genotypes on xenobiotic enhancement of allergic responses: randomised, placebo-controlled crossover study. <i>Lancet</i> 2004;363(9403):119-125.
19	Riedl M	Biology of diesel exhaust effects on respiratory function. <i>Journal of Allergy and Clinical Immunology</i> 2005;115(2):221-228.
17	Alberg AJ	Epidemiology of lung cancer: Looking to the future. <i>Journal of Clinical Oncology</i> 2005;23(14):3175-3185.
12	Dominici F	Fine particulate air pollution and hospital admission for cardiovascular and respiratory diseases. <i>JAMA-Journal of the American Medical Association</i> 2006;295(10):1127-1134.
4	Engel SM	Xenobiotic phenols in early pregnancy amniotic fluid. <i>Reproductive Toxicology</i> 2006;21(1):110-112.

Table 7. Highly Cited Human Health Paper in the Field of Molecular Biology & Genetics (top 1%)

No. of Cites	First Author	Paper
473	Arbour NC	TLR4 mutations are associated with endotoxin hyporesponsiveness in humans. <i>Nature Genetics</i> 2000;25(2):187-191.

Table 8. Highly Cited Human Health Paper in the Field of Immunology (top 1%)

No. of Cites	First Author	Paper
356	Wills-Karp M	Immunologic basis of antigen-induced airway hyperresponsiveness. <i>Annual Review of Immunology</i> 1999;17:255-281.

Table 9. Highly Cited Human Health Paper in the Field of Multidisciplinary (top 1%)

No. of Cites	First Author	Paper
79	Brenner DJ	Cancer risks attributable to low doses of ionizing radiation: assessing what we really know. <i>Proceedings of the National Academy of Sciences of the United States of America</i> 2003;100(24):13761-13766.

Table 10. Highly Cited Human Health Paper in the Field of Agricultural Sciences (top 1%)

No. of Cites	First Author	Paper
78	Birnbaum LS	Non-carcinogenic effects of TCDD in animals. <i>Food Additives and Contaminants</i> 2000;17(4):275-288.

Table 11. Highly Cited Human Health Paper in the Field of Engineering (top 1%)

No. of Cites	First Author	Paper
37	Vette AF	Characterization of indoor-outdoor aerosol concentration relationships during the Fresno PM exposure studies. <i>Aerosol Science and Technology</i> 2001;34(1):118-126.

Table 12. Highly Cited Human Health Paper in the Field of Biology & Biochemistry (top 1%)

No. of Cites	First Author	Paper
19	Kadiiska MB	Biomarkers of oxidative stress study II. Are oxidation products of lipids, proteins, and DNA markers of CCl ₄ poisoning? <i>Free Radical Biology and Medicine</i> 2005;38(6):698-710.

Table 13. Highly Cited Human Health Paper in the Field of Plant & Animal Science (top 1%)

No. of Cites	First Author	Paper
6	Evenson DP	Clinical aspects of sperm DNA fragmentation detection and male infertility. <i>Theriogenology</i> 2006;65(5):979-991.

Table 14. Very Highly Cited Human Health Papers (top 0.1%)

ESI Field	No. of Cites	First Author	Paper
Clinical Medicine	205	Canfield RL	Intellectual impairment in children with blood lead concentrations below 10 μ g per deciliter. <i>New England Journal of Medicine</i> 2003;348(16):1571-1526.
	12	Dominici F	Fine particulate air pollution and hospital admission for cardiovascular and respiratory diseases. <i>JAMA-Journal of the American Medical Association</i> 2006;295(10):1127-1134.
Environment/ Ecology	78	Birnbaum LS	Brominated flame retardants: Cause for concern? <i>Environmental Health Perspectives</i> 2004;112(1):9-17.
	25	Kunzli N	Ambient air pollution and atherosclerosis in Los Angeles. <i>Environmental Health Perspectives</i> 2005;113(2):201-206.
	6	Lu CS	Organic diets significantly lower children's dietary exposure to organophosphorus pesticides. <i>Environmental Health Perspectives</i> 2006;114(2):260-263.
Plant & Animal Science	6	Evenson DP	Clinical aspects of sperm DNA fragmentation detection and male infertility. <i>Theriogenology</i> 2006;65(5):979-991.

Ratio of Actual Cites to Expected Citation Rates

The expected citation rate is the average number of cites that a paper published in the same journal in the same year and of the same document type (article, review, editorial, etc.) has received from the year of publication to the present. Using the *ESI* average citation rates for papers published by field as the benchmark, in 16 of the 21 fields in which the EPA human health papers were published, the ratio

of actual to expected cites is greater than 1, indicating that the human health papers are more highly cited than the average papers in those fields (see Table 15).

Table 15. Ratio of Actual Cites to Expected Cites for Human Health Papers by Field

<i>ESI</i> Field	Total Cites	Expected Cite Rate	Ratio
Agricultural Sciences	134	39.99	3.35
Biology & Biochemistry	920	823.48	1.12
Chemistry	225	282.44	0.80
Clinical Medicine	6,313	3,397.59	1.86
Computer Science	24	7.03	3.41
Economics & Business	7	5.83	1.20
Engineering	212	78.68	2.69
Environment/Ecology	5,706	2,512.79	2.27
Geosciences	183	79.25	2.31
Immunology	824	426.91	1.93
Material Sciences	1	1.60	0.62
Mathematics	82	20.62	3.98
Microbiology	176	163.88	1.07
Molecular Biology & Genetics	1,107	1,291.71	0.86
Multidisciplinary	186	42.11	4.42
Neuroscience & Behavior	757	1,010.10	0.75
Pharmacology & Toxicology	5,809	3,396.03	1.71
Physics	2	5.21	0.38
Plant & Animal Science	62	47.12	1.32
Psychiatry/Psychology	61	30.70	1.99
Social Sciences, General	146	79.32	1.84

JCR Benchmarks

Impact Factor. The *JCR* Impact Factor is a well known metric in citation analysis. It is a measure of the frequency with which the “average article” in a journal has been cited in a particular year. The Impact Factor helps evaluate a journal’s relative importance, especially when compared to others in the same field. The Impact Factor is calculated by dividing the number of citations in the current year to

articles published in the 2 previous years by the total number of articles published in the 2 previous years.

Table 16 indicates the number of human health papers published in the top 10% of journals, based on the *JCR* Impact Factor. Nine hundred thirty-two (932) of 1,835 papers were published in the top 10% of journals, representing 51% of EPA’s human health papers. This indicates that more than half of the human health papers are published in the highest quality journals as determined by the *JCR* impact factor, which is more than 5 times the expected percentage.

Table 16. Human Health Papers in Top 10% of Journals by *JCR* Impact Factor

EPA Human Health Papers in that Journal	Journal	Impact Factor (IF)	<i>JCR</i> IF Rank
1	Annual Review of Immunology	47.400	2
3	New England Journal of Medicine	44.016	3
3	Science	30.927	6
1	Nature Immunology	27.011	14
1	Nature Genetics	25.797	15
5	Lancet	23.407	18
7	JAMA-Journal of the American Medical Association	23.332	19
2	Annual Review of Pharmacology and Toxicology	19.833	24
1	Journal of the National Cancer Institute	15.171	41
2	American Journal of Human Genetics	12.649	63
1	Journal of Clinical Oncology	11.810	70
1	Circulation	11.632	74
1	Progress in Lipid Research	11.372	75
2	Annual Review of Medicine	10.383	86
8	Proceedings of the National Academy of Sciences of the United States of America	10.231	89
1	Genome Research	10.139	91
2	Genome Biology	9.712	106
1	Circulation Research	9.408	111
2	British Medical Journal	9.052	122
24	American Journal of Respiratory and Critical Care Medicine	8.689	126
1	PLoS Medicine	8.389	133

Bibliometric Analysis of Human Health Research Program Journal Articles

EPA Human Health Papers in that Journal	Journal	Impact Factor (IF)	JCR IF Rank
3	Archives of Internal Medicine	8.016	139
1	Cell Death and Differentiation	7.785	149
1	Human Molecular Genetics	7.764	150
3	Drug Discovery Today	7.755	151
1	Clinical Chemistry	7.717	153
33	Journal of Allergy and Clinical Immunology	7.667	155
3	Cancer Research	7.616	157
1	Nucleic Acids Research	7.552	162
1	Brain	7.535	163
3	Journal of Neuroscience	7.506	165
2	Journal of the American Society of Nephrology	7.240	176
3	FASEB Journal	7.064	181
1	Arteriosclerosis Thrombosis and Vascular Biology	7.053	182
5	Journal of Immunology	6.387	205
2	Thorax	6.150	216
3	Bioinformatics	6.019	224
9	Pharmacogenetics	5.882	229
10	Journal of Biological Chemistry	5.854	232
3	American Journal of Clinical Nutrition	5.853	233
1	Clinical Cancer Research	5.715	238
224	Environmental Health Perspectives	5.342	257
4	Mutation Research-Reviews in Mutation Research	5.333	259
2	Endocrinology	5.313	261
1	Neuroimage	5.288	267
11	Carcinogenesis	5.108	288
24	American Journal of Epidemiology	5.068	290
1	Genetic Epidemiology	5.064	291
13	Critical Reviews in Toxicology	5.000	296

Bibliometric Analysis of Human Health Research Program Journal Articles

EPA Human Health Papers in that Journal	Journal	Impact Factor (IF)	JCR IF Rank
6	Free Radical Biology and Medicine	4.971	302
4	Journal of Infectious Diseases	4.953	306
3	Journal of Medicinal Chemistry	4.926	313
1	Current Opinion in Neurology	4.873	319
1	Bipolar Disorders	4.812	328
1	Cancer	4.800	329
1	International Journal of Cancer	4.700	338
1	Physiological Genomics	4.636	346
1	Biostatistics	4.529	361
13	Cancer Epidemiology Biomarkers & Prevention	4.460	378
1	Human Genetics	4.331	402
11	Pediatrics	4.272	420
2	Antioxidants and Redox Signaling	4.232	427
8	Journal of Pharmacology and Experimental Therapeutics	4.098	456
1	Neurobiology of Learning and Memory	4.091	458
1	Genes Brain and Behavior	4.091	458
21	Environmental Science & Technology	4.054	467
17	Epidemiology	4.043	471
7	Drug Metabolism and Disposition	4.015	481
4	Chest	4.008	482
10	American Journal of Respiratory Cell and Molecular Biology	3.988	488
1	Obesity Research	3.972	491
1	European Journal of Neuroscience	3.949	495
2	European Respiratory Journal	3.947	497
2	American Journal of Physiology-Cell Physiology	3.942	500
21	American Journal of Physiology-Lung Cellular and Molecular Physiology	3.939	502
2	Infection and Immunity	3.933	506

Bibliometric Analysis of Human Health Research Program Journal Articles

EPA Human Health Papers in that Journal	Journal	Impact Factor (IF)	JCR IF Rank
2	Journal of Lipid Research	3.909	516
7	Journal of Pediatrics	3.837	541
4	Applied and Environmental Microbiology	3.818	544
1	Journal of Computational Chemistry	3.786	551
1	Current Opinion in Drug Discovery & Development	3.778	555
1	Journal of Nutrition	3.689	574
3	Human Reproduction	3.669	581
1	Investigative Ophthalmology & Visual Science	3.643	589
1	Journal of Analytical Atomic Spectrometry	3.640	591
1	Neuropharmacology	3.637	592
2	Pharmacogenomics	3.623	596
2	Biochemical Pharmacology	3.617	600
7	Biology of Reproduction	3.583	615
4	Archives of Pediatrics & Adolescent Medicine	3.566	619
4	American Journal of Public Health	3.566	619
3	American Journal of Physiology-Heart and Circulatory Physiology	3.560	623
2	Clinical and Experimental Allergy	3.553	625
1	Glycobiology	3.512	635
3	Magnetic Resonance in Medicine	3.508	638
1	Journal of the American Geriatrics Society	3.479	649
2	Neuroscience	3.410	676
14	Mutation Research-Fundamental and Molecular Mechanisms of Mutagenesis	3.340	696
20	Chemical Research in Toxicology	3.339	699
4	Clinical Immunology	3.217	733
1	Lung Cancer	3.172	753
3	Archives of Biochemistry and Biophysics	3.152	761
74	Toxicology and Applied Pharmacology	3.148	764

EPA Human Health Papers in that Journal	Journal	Impact Factor (IF)	JCR IF Rank
1	Journal of Chemical Physics	3.138	766
1	Shock	3.122	769
1	Journal of Neurology Neurosurgery and Psychiatry	3.122	769
1	Radiation Research	3.099	776
1	Journal of Chromatography A	3.096	778
152	Toxicological Sciences	3.088	780
2	American Journal of Obstetrics and Gynecology	3.083	782
1	Behavioral Neuroscience	3.071	790
5	Cancer Letters	3.049	800
5	Journal of Applied Physiology	3.037	802
1	Water Research	3.019	809
1	Journal of General Internal Medicine	3.013	810
1	Journal of Epidemiology and Community Health	3.003	817
4	Biochemical and Biophysical Research Communications	3.000	819
1	Journal of Neuroendocrinology	2.974	839
1	Pediatric Research	2.875	870
1	Cell Stress & Chaperones	2.875	870
Total = 932			

Immediacy Index. The *JCR Immediacy Index* is a measure of how quickly the *average article* in a journal is cited. It indicates how often articles published in a journal are cited within the year they are published. The *Immediacy Index* is calculated by dividing the number of citations to articles published in a given year by the number of articles published in that year.

Table 17 indicates the number of human health papers published in the top 10% of journals, based on the *JCR Immediacy Index*. Nine hundred thirty-eight (938) of the 1,835 papers appear in the top 10% of journals, representing 51% of the human health papers. This indicates that more than half of the human health papers are published in the highest quality journals as determined by the *JCR immediacy index*, which is more than 5 times higher than the expected percentage.

Table 17. Human Health Papers in Top 10% of Journals by JCR Immediacy Index

EPA Human Health Papers in that Journal	Journal	Immediacy Index (II)	JCR II Rank
3	New England Journal of Medicine	13.422	3
1	Annual Review of Immunology	10.828	4
3	Science	6.398	6
5	Lancet	6.253	7
1	Nature Genetics	5.921	10
2	Annual Review of Pharmacology and Toxicology	5.793	12
1	Nature Immunology	5.362	15
7	JAMA-Journal of the American Medical Association	5.082	17
2	British Medical Journal	4.248	26
1	Journal of the National Cancer Institute	4.063	27
2	Annual Review of Medicine	4.033	28
1	PLoS Medicine	4.033	28
1	BMC Genetics	3.717	35
2	American Journal of Human Genetics	2.959	49
1	Journal of Clinical Oncology	2.831	55
33	Journal of Allergy and Clinical Immunology	2.402	64
1	Genome Research	2.000	92
24	American Journal of Respiratory and Critical Care Medicine	1.883	104
3	Archives of Internal Medicine	1.782	113
8	Proceedings of the National Academy of Sciences of the United States of America	1.746	121
1	Circulation Research	1.702	126
1	Circulation	1.641	134
1	Human Molecular Genetics	1.621	135
1	Cell Death and Differentiation	1.602	136
2	Antioxidants and Redox Signaling	1.583	139
4	Journal of Infectious Diseases	1.547	145
1	Arteriosclerosis Thrombosis and Vascular Biology	1.452	157

Bibliometric Analysis of Human Health Research Program Journal Articles

EPA Human Health Papers in that Journal	Journal	Immediacy Index (II)	JCR II Rank
1	Nucleic Acids Research	1.391	173
1	International Journal of Toxicology	1.309	193
17	Epidemiology	1.298	198
1	Brain	1.266	207
10	Journal of Biological Chemistry	1.265	208
2	Endocrinology	1.260	210
3	Journal of Neuroscience	1.254	212
2	Genome Biology	1.230	221
3	American Journal of Clinical Nutrition	1.200	227
1	Journal of Community Psychology	1.200	227
3	FASEB Journal	1.181	239
4	Mutation Research-Reviews in Mutation Research	1.143	252
2	Journal of the American Society of Nephrology	1.129	257
3	Drug Discovery Today	1.125	258
24	American Journal of Epidemiology	1.099	271
2	Thorax	1.097	273
1	Physiological Genomics	1.058	287
1	International Journal of Cancer	1.016	306
11	Pediatrics	1.005	309
3	Cancer Research	1.001	310
224	Environmental Health Perspectives	0.955	346
23	Inhalation Toxicology	0.947	352
1	Genetic Epidemiology	0.945	353
3	Bioinformatics	0.944	354
2	Mechanisms of Ageing and Development	0.942	356
3	Journal of Medicinal Chemistry	0.937	360
11	Carcinogenesis	0.935	362
1	Biostatistics	0.933	363
1	Progress in Lipid Research	0.929	366

Bibliometric Analysis of Human Health Research Program Journal Articles

EPA Human Health Papers in that Journal	Journal	Immediacy Index (II)	JCR II Rank
2	European Respiratory Journal	0.916	372
5	Journal of Immunology	0.906	381
8	Journal of Pharmacology and Experimental Therapeutics	0.891	397
4	Archives of Pediatrics & Adolescent Medicine	0.875	411
2	Infection Control and Hospital Epidemiology	0.868	416
2	Journal of Lipid Research	0.855	426
1	Clinical Cancer Research	0.846	434
1	Clinical Chemistry	0.839	441
21	American Journal of Physiology-Lung Cellular and Molecular Physiology	0.816	464
1	Neuropeptides	0.812	467
2	American Journal of Physiology-Cell Physiology	0.808	473
4	American Journal of Public Health	0.805	475
3	Archives of Biochemistry and Biophysics	0.774	495
3	American Journal of Physiology-Heart and Circulatory Physiology	0.757	505
7	Biology of Reproduction	0.755	507
10	American Journal of Respiratory Cell and Molecular Biology	0.745	517
1	Glycobiology	0.736	530
1	Lung Cancer	0.735	532
7	Drug Metabolism and Disposition	0.733	534
5	Journal of Applied Physiology	0.732	537
1	Journal of Computational Chemistry	0.731	538
10	Science of the Total Environment	0.731	538
20	Chemical Research in Toxicology	0.729	542
1	Shock	0.718	559
1	Journal of Chemical Physics	0.710	572
1	Journal of Inorganic Biochemistry	0.696	585
6	Free Radical Biology and Medicine	0.696	585

Bibliometric Analysis of Human Health Research Program Journal Articles

EPA Human Health Papers in that Journal	Journal	Immediacy Index (II)	JCR II Rank
3	Human Reproduction	0.693	596
1	Genes Brain and Behavior	0.690	598
14	Mutation Research-Fundamental and Molecular Mechanisms of Mutagenesis	0.682	604
1	ATLA-Alternatives to Laboratory Animals	0.676	615
1	Neuroimage	0.668	627
2	Mental Retardation and Developmental Disabilities Research Reviews	0.667	628
1	Current Opinion in Drug Discovery & Development	0.662	642
7	Journal of Pediatrics	0.660	645
2	Infection and Immunity	0.648	664
1	Cancer	0.641	677
1	Human Genetics	0.639	679
2	Journal of Geophysical Research-Atmospheres	0.630	696
11	Human and Ecological Risk Assessment	0.628	699
2	American Journal of Managed Care	0.624	705
152	Toxicological Sciences	0.617	716
1	Journal of Nutrition	0.598	742
1	Neurobiology of Learning and Memory	0.593	754
1	Journal of Neurology Neurosurgery and Psychiatry	0.593	754
1	Medical Decision Making	0.585	768
1	Journal of Epidemiology and Community Health	0.580	783
13	Cancer Epidemiology Biomarkers & Prevention	0.579	785
73	Journal of Exposure Analysis and Environmental Epidemiology	0.571	801
2	Archives of Disease in Childhood	0.569	810
1	Journal of the American Dietetic Association	0.559	830
2	Neuroscience	0.555	842
1	Neuropharmacology	0.552	843
25	Environmental Research	0.551	848

EPA Human Health Papers in that Journal	Journal	Immediacy Index (II)	JCR II Rank
7	American Journal of Industrial Medicine	0.549	858
1	Analyst	0.546	862
Total = 938			

Hot Papers

ESI establishes citation thresholds for hot papers, which are selected from the highly cited papers in different fields, but the time frame for citing and cited papers is much shorter—papers must be cited within 2 years of publication and the citations must occur in a 2-month time period. Papers are assigned to 2-month periods and thresholds are set for each period and field to select 0.1% of papers. There were no hot papers identified for the current 2-month period (i.e., July-August 2006), but there were a number of hot papers identified from previous periods.

Using the hot paper thresholds established by *ESI* as a benchmark, 15 hot papers, representing 0.8% of the human health papers, were identified in three fields—Clinical Medicine, Environment/Ecology, and Pharmacology & Toxicology. The hot papers are listed in Table 18.

Table 18. Hot Papers Identified Using *ESI* Thresholds

Field	<i>ESI</i> Hot Papers Threshold	No. of Cites in 2-Month Period	Paper
Clinical Medicine	4	5 cites in June-July 2005	Alberg AJ, et al. Epidemiology of lung cancer: looking to the future. <i>Journal of Clinical Oncology</i> 2005;23(14):3175-3185.
Environment/ Ecology	7	7 cites in May-June 2004	Perera FP, et al. Effects of transplacental exposure to environmental pollutants on birth outcomes in a multiethnic population. <i>Environmental Health Perspectives</i> 2003;111(2):201-205.
	5	6 cites in December 2005-January 2006	Kunzli N, et al. Ambient air pollution and atherosclerosis in Los Angeles. <i>Environmental Health Perspectives</i> 2005;113(2):201-206.
	5	5 cites in April-May 2006	Lanphear BP, et al. Low-level environmental lead exposure and children's intellectual function: An international pooled analysis. <i>Environmental Health Perspectives</i> 2005;113(7):894-899.
	3	3 cites in April-May 2004	Sexton K, et al. Comparison of personal, indoor, and outdoor exposures to hazardous air pollutants in three urban communities. <i>Environmental Science & Technology</i> 2004;38(2):423-430.

Field	ESI Hot Papers Threshold	No. of Cites in 2-Month Period	Paper
Environment/ Ecology	3	3 cites in March-April 2001	Garman RH, et al. Methods to identify and characterize developmental neurotoxicity for human health risk assessment. II: Neuropathology. <i>Environmental Health Perspectives</i> 2001;109(Suppl 1):93-100.
	3	3 cites in November-December 2003	Schreinemachers DM. Birth malformations and other adverse perinatal outcomes in four US wheat-producing states. <i>Environmental Health Perspectives</i> 2003;111(9):1259-1264.
	3	3 cites in August-September 2005	Neednam LL, et al. Exposure assessment in the National Children's Study: Introduction. <i>Environmental Health Perspectives</i> 2005;113(8):1076-1082.
	3	3 cites in May-June 2005	Yolton K, et al. Exposure to environmental tobacco smoke and cognitive abilities among US children and adolescents. <i>Environmental Health Perspectives</i> 2005;113(1):98-103.
Pharmacology & Toxicology	8	11 cites in August-September 2004	Nesnow S, et al. DNA damage induced by methylated trivalent arsenicals is mediated by reactive oxygen species. <i>Chemical Research in Toxicology</i> 2002;15(12):1627-1634.
	8	10 cites in November-December 2002	Kitchin KT. Recent advances in arsenic carcinogenesis: Modes of action, animal model systems, and methylated arsenic metabolites. <i>Toxicology and Applied Pharmacology</i> 2001;172(3):249-261.
	2	3 cites in January-February 2006	Carmichael NG, et al. Agricultural chemical safety assessment: A multisector approach to the modernization of human safety requirements. <i>Critical Reviews in Toxicology</i> 2006;36(1):1-7.
	2	3 cites in January-February 2006	Cooper RL, et al. A tiered approach to life stages testing for agricultural chemical safety assessment. <i>Critical Reviews in Toxicology</i> 2006;36(1):69-98.
	2	2 cites in September-October 2006	Anand SS, et al. Characterization of deltamethrin metabolism by rat plasma and liver microsomes. <i>Toxicology and Applied Pharmacology</i> 2006;212(2):156-166.
	2	2 cites in June-July 1999	Faustman EM, et al. Biologically based dose-response models for developmental toxicants: lessons from methylmercury. <i>Inhalation Toxicology</i> 1999;11(6-7):559-572.

Author Self-Citation

Self-citations are journal article references to articles from that same author (i.e., the first author). Because higher author self-citation rates can inflate the number of citations, the author self-citation rate was calculated for the human health papers. Of the 22,937 total cites, 992 are author self-cites—a 4.3% author self-citation rate. Garfield and Sher³ found that authors working in research-based disciplines tend to cite themselves on the average of 20% of the time. MacRoberts and MacRoberts⁴ claim that approximately 10% to 30% of all the citations listed fall into the category of author self-citation. Kovacic and Misak⁵ recently reported a 20% author self-citation rate for medical literature. Therefore, the 4.3% self-cite rate for the human health papers is well below the range for author self-citation.

Highly Cited Researchers

A search of Thomson's *ISI Highly Cited.com* revealed that 81 (3.3%) of the 2,432 authors of the human health papers are highly cited researchers. *ISI Highly Cited.com* is a database of the world's most influential researchers who have made key contributions to science and technology during the period from 1981 to 1999. The highly cited researchers identified during this analysis of the human health publications are presented in Table 19.

Table 19. Highly Cited Researchers Authoring Human Health Publications

Highly Cited Researcher	Affiliation	ESI Field
Amaral, David G.	University of California–Davis	Neuroscience
Ames, Bruce N.	Children's Hospital Oakland Research Institute	Biology & Biochemistry Molecular Biology & Genetics
Andersen, Melvin E.	CIIT Centers for Health Research	Pharmacology
Ankley, Gerald T	U.S. EPA	Environment/Ecology
Arey Janet	Air Pollution Research Center	Environment/Ecology
Atkinson, Roger	Air Pollution Research Center	Environment/Ecology
Benowitz, Neil L.	University of California–San Francisco	Pharmacology
Birnbaum, Linda S.	U.S. EPA	Pharmacology
Bishop, John Michael	University of California–San Francisco	Molecular Biology & Genetics

³ Garfield E, Sher IH. New factors in the evaluation of scientific literature through citation indexing. *American Documentation* 1963;18(July):195-210.

⁴ MacRoberts MH, MacRoberts BR. Problems of citation analysis: a critical review. *Journal of the American Society of Information Science* 1989;40(5):342-349.

⁵ Kavaci N, Misak A. Author self-citation in medical literature. *Canadian Medical Association Journal* 2004;170(13):1929-1930.

Highly Cited Researcher	Affiliation	ESI Field
Boobis, Alan R.	Imperial College London	Pharmacology
Breslau, Naomi	Michigan State University	Psychology/Psychiatry
Chapman, Martin D.	INDOOR Biotechnologies, Inc.	Immunology
Clegg, William	University of Newcastle upon Tyne	Chemistry
Eisenreich, Steven J.	Rutgers, The State University of New Jersey	Environment/Ecology
Elliott, Lloyd F.	Oregon State University	Environment/Ecology
Evans, David A.	Harvard University	Chemistry
Fischer, Jean	Chemistry	Chemistry
Fornace Jr., Albert J	Harvard School of Public Health	Molecular Biology & Genetics
Garcia, Rolando R.	National Center for Atmospheric Research	Geosciences
German, J. Bruce	University of California–Davis	Agricultural Sciences
Goldman, John M.	Imperial College School of Medicine	Clinical Medicine
Goldman, Lee	University of California–San Francisco	Clinical Medicine
Gray Jr., Leon Earl	U.S. EPA	Pharmacology
Greenberg, Everett P.	University of Iowa	Microbiology
Guillette, Louis J.	University of Florida	Environment/Ecology
Harris, Curtis C.	National Cancer Institute	Clinical Medicine
Jones, Russell L.	University of California–Berkeley	Plant & Animal Science
Kadlubar, Fred F.	U.S. Food and Drug Administration	Pharmacology
Kimber, Ian	Syngenta Central Toxicology Laboratory	Pharmacology
Koutrakis, Petros	Harvard School of Public Health	Environment/Ecology
Lee, Kuo-Hsiung	University of North Carolina	Agricultural Sciences
Levin, Simon A.	Princeton University	Environment/Ecology
Levine, Michael	University of California–Berkeley	Molecular Biology & Genetics
Lewis, Jack	University of Cambridge	Chemistry
Liang, Kung Yee	Johns Hopkins University	Mathematics
Lindberg, Steven E.	Oak Ridge National Laboratory	Environment/Ecology
Lioy, Paul J.	University of Medicine & Dentistry of	Environment/Ecology

Highly Cited Researcher	Affiliation	ESI Field
	New Jersey	
Lippmann, Morton	New York University School of Medicine	Environment/Ecology
Liu, Jie	National Cancer Institute	Pharmacology
Liu, Yong-Jun	DNAX Research Institute of Molecular and Cellular Biology	Immunology
Mazurek, Monica A.	Rutgers, The State University of New Jersey	Environment/Ecology
Morris, Peter John	Royal College of Surgeons	Clinical Medicine
Murphy, Dennis L.	National Institute of Mental Health	Psychology/Psychiatry
Murphy, Patricia A.	Iowa State University	Agricultural Sciences
Murray, David M.	University of Memphis	Social Sciences, General
Needham, Larry L.	National Center for Environmental Health	Environment/Ecology
Olmstead, Marilyn M.	University of California–Davis	Chemistry
Parker, John C.	Oak Ridge National Laboratory	Environment/Ecology
Peterson, Richard E.	University of Wisconsin–Madison	Pharmacology
Plattsmills, Thomas A.E.	University of Virginia Health System	Immunology
Rasmussen, Steven A.	Brown University	Psychology/Psychiatry
Richards, James H.	University of California–Davis	Environment/Ecology
Roberts, Robert	Baylor College of Medicine	Clinical Medicine
Ross, Judith	Thomas Jefferson University	Clinical Medicine
Roy, Alec	New Jersey Healthcare System	Psychology/Psychiatry
Safe, Stephen H.	Texas A&M University	Pharmacology Environment/Ecology
Schroeder, Julian I.	University of California–San Diego	Plant & Animal Science
Schwartz, Joel D.	Harvard School of Public Health	Pharmacology Environment/Ecology
Sharp, Frank R.	University of Cincinnati	Neuroscience
Shaw, George M.	University of Alabama at Birmingham School of Medicine	Microbiology
Speizer, Frank E.	Harvard Medical School	Clinical Medicine
Spengler, John D.	Harvard University	Environment/Ecology

Highly Cited Researcher	Affiliation	ESI Field
Stamler, Jeremiah	Northwestern University	Clinical Medicine
Stewart, Patricia	National Cancer Institute	Clinical Medicine
Thompson, Craig B.	University of Pennsylvania Cancer Center	Molecular Biology & Genetics Immunology
Turco, Richard P.	University of California–Los Angeles	Geosciences
Van Thiel, David H.	Loyola University Medical Center	Clinical Medicine
Walker, Nigel	National Institute of Environmental Health Sciences	Chemistry
Wallace, Robert B.	University of Iowa	Social Sciences, General
Walter, Peter	University of California–San Francisco	Molecular Biology & Genetics
Wand, Matthew P.	University of South Wales	Mathematics
Wang, Xiadong	University of Texas Southwest Medical Center at Dallas	Molecular Biology & Genetics
Watson, John G.	Desert Research Institute	Environment/Ecology
Willett, Walter C.	Harvard School of Public Health	Clinical Medicine
Williams, Roger S.	Royal Free and University College Medical School	Clinical Medicine
John T. Wilson	U.S. EPA	Environment/Ecology
Winer, Arthur M.	University of California–Los Angeles	Environment/Ecology
Yang, Chung S.	Rutgers, The State University of New Jersey	Pharmacology
Yang, Wei T.	Duke University	Physics
Zeger, Scott L.	Johns Hopkins University	Mathematics
Zhang, Jinghui	National Cancer Institute	Biology & Biochemistry
Total = 81		

Patents

There were no patents or patent applications associated with this research program.