

Essential Science Indicators

Essential Science Indicators (ESI) is a resource that enables researchers to conduct ongoing, quantitative analyses of research performance and track trends in science. Covering a multidisciplinary selection of 11,000+ journals from around the world, this in-depth analytical tool offers data for ranking scientists, institutions, countries, and journals.

Compilation of science performance statistics and science trends data is based on journal article publication counts and citation data from Thomson Scientific databases. Available as a ten-year rolling file, *ESI* covers 10 million articles in 22 specific fields of research, and is updated every two months.

Access Essential Science Indicators

1. At the Library Homepage (<http://www.cityu.edu.hk/lib/>), select **E-Resources**.
2. Select **Databases: [Title List](#)**.
3. Select **Essential Science Indicators** from the alphabetical list of databases.

Get information

Select a section that you want to explore:

Compare rankings of scientists, institutions, countries/territories and journals in 22 scientific fields using total citation counts and cites per paper. (Go to [page 2 - 5](#) for details)

<ul style="list-style-type: none"> ● Citation Rankings: ● Most Cited Papers: ● Citation Analysis: 	<ul style="list-style-type: none"> - Scientists - Institutions - Countries/Territories - Journals <ul style="list-style-type: none"> - Highly Cited Papers (last 10 years) - Hot Papers (last 2 years) <ul style="list-style-type: none"> - Baselines - Research Fronts 	<p>Commentary:</p> <ul style="list-style-type: none"> IN-CITES SPECIAL TOPICS SCIENCE-WATCH
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These brief editorial discussions provide guidance on data analysis and interpretation.

Papers selected based on percentile rankings in specific fields of science and time periods.

Highly Cited Papers: top cited papers over the past 10 years in each of 22 scientific fields.

Hot Papers: recent papers (over the past 2 years) that show an unusual rate of citation.

(Go to [page 6](#) for details)

Identify criteria for highly cited papers and to track trends in current research.

Baselines: measures of cumulative citation frequency across large groups of papers that provide expected citation rates for groups of papers. You can obtain baselines by Average Citation Rates, Percentiles, and Field Rankings.

Research Fronts: a group of related highly cited papers (known as *core papers*) in a specialized topic defined by cluster analysis. These papers indicate current areas of intensive and breakthrough research.

(Go to [page 7 - 8](#) for details)

CITATION RANKINGS

The four Citation Rankings menus function the same way. Each menu has two search options:

- **By Field:** Search for information based on a specific field of study or All Fields.
- **By Name:** Search for information based on a name.

Navigating the rankings list

Each page lists up to 20 items. If there are more than 20 items, then a navigation bar displays. Click the appropriate arrow buttons on the navigation bar to view other pages of countries/territories. Use the page numbers between the navigation buttons to jump to a specific page.



Scientists Menu

Use this menu to find a specific scientist by name or to find the highest ranked scientists in a specific field of research (or all fields).

SCIENTISTS MENU

BY FIELD Select a scientist from this field: (All Fields)

OR

BY NAME Select a scientist from the alphabetical list or enter a name to search.

0-9 **A B C D E F G H I J K L M N O P Q R S T U V W X Y Z**

Example: WEINBERG RA [\(more examples\)](#)

Select a field of research and click "Go" to display **Scientist Rankings** page that lists the highest ranked scientists in the selected field.

Select a scientist from the list (or enter a scientist name and click "Search") to display **ranked fields** for the selected scientist. You can then select a field of research and display the **Scientist Rankings** page that contains the selected scientist.

Scientist Rankings page

SCIENTIST RANKINGS IN

Display items with at least: 0 Citation(s) per Paper

Sorted by: Citations Papers Citations per Paper Scientist

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	View	Scientist	Papers	Citations	Citations Per Paper
1		AKIRA, S	254	24,760	97.48
2		TAKEDA, K	170	18,854	110.91
3		FLAVELL, RA	153	10,841	70.86
4		BANCHEREAU, J	63	10,633	168.78

Display items by citation, paper, or citations per paper. After entering a number and selecting an option, click "SORT AGAIN".

Use different criteria to sort data in the table.

Click to display the **Top Papers** page for the selected scientist.

Note that the Top Papers page only includes those papers that meet a certain citation threshold specific to the field and year (to learn more about **Citation Threshold**, go to <http://www.in-cites.com/thresholds-highly-cited.html>). Therefore, the number of papers included on the Top Papers page is less than the number of papers listed in the Papers column of the rankings table, which is a count of all papers (regardless of whether each paper met the threshold). In other words, just because an author is highly cited, it does not mean that each (or any) of his/her papers meets the paper citation threshold to be included in the data.

Click to display the **Graph** page for the selected scientist. The Graph page contains three graphs that provide statistical data on the **number of papers**, **number of citations**, and **average number of citations received** over a 5-year period.

Graph data is available by clicking on the View table of graph data link in the Graph page.

Institutions Menu

Use this menu to find a specific institution by name or to find the highest ranked institutions in a specific field of research (or all fields).

INSTITUTIONS MENU

BY FIELD Select an institution from this field: (All Fields)

OR

BY NAME Select an institution from the alphabetical list or enter a name to search.

0-9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Example: HARVARD UNIV* [\(more examples\)](#)

Select a field of research and click "Go" to display **Institution Rankings** page that lists the highest ranked institutions in the selected field.

Select an institution from the list (or enter an institution name and click "Search") to display **ranked fields** for the selected institution. You can then select a field of research and display the **Institution Rankings** page that contains the selected institution.

Note that abbreviations are used, e.g., enter **city univ hong kong** for City University of Hong Kong.

See the bottom half of the Institutions Menu page for more search examples.

Institution Rankings page

INSTITUTION RANKINGS IN

Display items with at least: 0

Sorted by: Citations (selected), Paper(s), Citation(s) per Paper, Citation(s)

61 - 80 (of 911) Page 4 of 46

	View	Institution	Papers	Citations	Citations Per Paper
61	<input type="button" value="View"/>	CITY UNIV HONG KONG	2,734	9,267	3.39
62	<input type="button" value="View"/>	HONG KONG UNIV SCI & TECHNOL	2,044	9,156	4.48
63	<input type="button" value="View"/>	TSING HUA UNIV	3,999	9,153	2.29
64	<input type="button" value="View"/>	TECHNION ISRAEL INST TECHNOL	2,381	9,125	3.83
65	<input type="button" value="View"/>	UNIV OXFORD	1,590	9,102	5.72

Display items by citation, paper, or citations per paper. After entering a number and selecting an option, click "SORT AGAIN".

Use different criteria to sort data in the table.

Click to display the **Top Papers** page for the selected institution.

Note that the Top Papers page only includes those papers that meet a certain citation threshold specific to the field and year (to learn more about **Citation Threshold**, go to <http://www.in-cites.com/thresholds-highly-cited.html>). Therefore, the number of papers included on the Top Papers page is less than the number of papers listed in the Papers column of the rankings table, which is a count of all papers (regardless of whether each paper met the threshold). In other words, just because an institution is highly cited, it does not mean that each (or any) of the papers from that institution meets the paper citation threshold to be included in the data.

Click to display the **Graph** page for the selected institution. The Graph page contains three graphs that provide statistical data on the **number of papers**, **number of citations**, and **average number of citations received** over a 5-year period.

Graph data is available by clicking on the [View table of graph data](#) link in the Graph page.

Countries/Territories Menu

Use this menu to find a specific country/territory by name or to find the highest ranked countries/territories in a specific field of research (or all fields).

COUNTRIES/TERRITORIES MENU	
BY FIELD	Select a country or territory from this field: (All Fields) <input type="button" value="GO"/>
OR	
BY NAME	Select a country or territory from the alphabetical list or enter a name to search. A-Z (Countries/Territories List) <i>Example: FRANCE (more examples)</i> <input type="text"/> <input type="button" value="SEARCH"/>

Select a field of research and click "Go" to display **Country/Territory Rankings** page that lists the highest ranked countries/territories in the selected field.

Select a country/territory from the list (or enter a country/territory name and click "Search") to display **ranked fields** for the selected country/territory. You can then select a field of research and display the **Country/Territory Rankings** page that contains the selected country/territory.

Country/Territory Rankings page

COUNTRY/TERRITORY RANKINGS						
Display items with at least: 0 Citation(s)						
Sorted by: Citations						
41 - 60 (of 87) Page 3 of 5						
	View	Country/Territory	Papers	Citations	Citations Per Paper	
41		SLOVENIA	2,233	17,103	7.66	
42		NEW ZEALAND	1,792	16,653	9.29	
43		HONG KONG	1,273	12,914	10.14	
44		ARMENIA	1,516	11,893	7.84	

Display items by citation, paper, or citations per paper. After entering a number and selecting an option, click "SORT AGAIN".

Use different criteria to sort data in the table.

Click to display the **Top Papers** page for the selected country/territory in the selected field.

Note that the Top Papers page only includes those papers that meet a certain citation threshold specific to the field and year (to learn more about **Citation Threshold**, go to <http://www.in-cites.com/thresholds-highly-cited.html>). Therefore, the number of papers included on the Top Papers page is less than the number of papers listed in the Papers column of the rankings table, which is a count of all papers (regardless of whether each paper met the threshold). In other words, just because a country/territory is highly cited, it does not mean that each (or any) of the papers from that country/territory meets the paper citation threshold to be included in the data.

Click to display the **Graph** page for the selected country/territory. The Graph page contains three graphs that provide statistical data on the **number of papers**, **number of citations**, and **average number of citations received** over a 5-year period.

Graph data is available by clicking on the [View table of graph data](#) link in the Graph page.

Journals Menu

Use this menu to find a specific journal by name or to find the highest ranked journals in a specific field of research (or all fields).

JOURNALS MENU

BY FIELD Select a journal from this field: (All Fields)

OR

BY NAME Select a Journal from the alphabetical list or enter an abbreviated name to search.

0-9 **A B C D E F G H I J K L M N O P Q R S T U V W X Y Z**

Example: J CELL* [\(more examples\)](#)

JOURNAL SEARCH EXAMPLES

Note: Journals are displayed and searched by abbreviated titles ([view full titles](#)).

- Enter a full or partial abbreviated journal title. If you enter a partial title, end it with an asterisk (e.g. ASTRO* to search for ASTROPHYS J and ASTROPHYS LETT).
- Enter NATURE* to search for citation data from the journals NATURE, NATURE-NEW BIOL, and NATURE-PHYS

Note that abbreviations are used. If you are not sure, consult the [full titles](#) list.

Select a field of research and click "Go" to display **Journal Rankings** page that lists the highest ranked journals in the selected field.

Select a journal from the list (or enter a journal title and click "Search") to display **ranked fields** for the selected journal. You can then select a field of research and display the **Journal Rankings** page that contains the selected journal.

Journal Rankings page

JOURNAL RANKINGS IN BIOLOGY

Display items with at least: 0

Sorted by: Citations

1 - 20 (of 236) Page 1 of 12

View	Journal	Papers	Citations	Citations Per Paper
1	J BIOL CHEM	56,321	1,629,510	28.93
2	PROC NAT ACAD SCI USA	7,040	327,436	46.51
3	BIOCHEMISTRY-USA	17,962	322,624	17.96
4	BIOCHEM BIOPHYS RES COMMUN	21,116	255,334	12.09

Display items by citation, paper, or citations per paper. After entering a number and selecting an option, click "SORT AGAIN".

Use different criteria to sort data in the table.

Click to display the **Top Papers** page for the selected journal in the selected field.

Note that the Top Papers page only includes those papers that meet a certain citation threshold specific to the field and year (to learn more about **Citation Threshold**, go to <http://www.in-cites.com/thresholds-highly-cited.html>). Therefore, the number of papers included on the Top Papers page is less than the number of papers listed in the Papers column of the rankings table, which is a count of all papers (regardless of whether each paper met the threshold). In other words, just because a journal is highly cited, it does not mean that each (or any) of its papers meets the paper citation threshold to be included in the data.

Click to display the **Graph** page for the selected journal. The Graph page contains three graphs that provide statistical data on the **number of papers**, **number of citations**, and **average number of citations received** over a 5-year period.

Graph data is available by clicking on the [View table of graph data](#) link in the Graph page.

MOST CITED PAPERS

- Highly Cited Papers lists the top cited papers over the past 10 years in each of 22 scientific fields.
- Hot Papers focus on very recent papers (over the past 2 years) that show an unusual rate of citation.

Both the Highly Cited Papers Menu and the Hot Papers Menu function similarly. Select to search **BY FIELD**, **BY NAME**, or **BY SEARCHING**:

HIGHLY CITED PAPERS MENU	
BY FIELD	Display papers from this field: (All Fields) <input type="button" value="GO"/>
OR	
BY NAME	Show alphabetic list of: Scientist <input type="button" value="GO"/>
OR	
BY SEARCHING	Enter terms or phrases separated by the operators AND or OR in one or more of the search fields below. Search fields are automatically combined using the AND operator.

HOT PAPERS MENU	
BY FIELD	Display papers from this field: (All Fields) <input type="button" value="GO"/>
OR	
BY NAME	Show alphabetic list of: Scientist <input type="button" value="GO"/>
OR	
BY SEARCHING	Enter terms or phrases separated by the operators AND or OR in one or more of the search fields below. Search fields are automatically combined using the AND operator.
Title word:	<input type="text"/> <i>example: climat* and chang*</i>
Scientist:	<input type="text"/> <i>example: SMITH A*</i>
Institution:	<input type="text"/> <i>example: SALK INST*</i>
Country/Territory:	<input type="text"/> <i>example: USA</i>
Journal:	<input type="text"/> <i>example: Phys Rev Lett* (view full titles)</i>
<input type="button" value="SEARCH"/> <input type="button" value="CLEAR"/>	

Select a category and click "Go" to view an alphabetical list.

Use different criteria to sort the papers.

Enter a search query in one or more fields and click "SEARCH" to find specific papers.

Highly Cited Papers / Hot Papers

Click on the Graph icon or the "Hot Paper" button to view a graph showing the citation statistics over the last 2 years.

Graph data is available by clicking on the [View table of graph data](#) link in the Graph page.

HOT PAPERS IN IMMUNOLOGY	
Sorted by: Citations <input type="button" value="SORT AGAIN"/>	
1 - 20 (of 23) Page 1 of 2	
1 Citations: 269	<input type="button" value="HOT PAPER"/> <input type="button" value="RESEARCH FRONT"/> <input type="button" value="WEB OF SCIENCE"/>
Title:	NATURALLY ARISING FOXP3-EXPRESSING CD25(+) CD4(+) REGULATORY T CELLS IN IMMUNOLOGICAL TOLERANCE TO SELF AND NON-SELF
Authors:	SAKAGUCHI S
Source:	NAT IMMUNOL 6 (4): 345-352 APR 2005
Addresses:	Kyoto Univ , Inst Frontier Med Sci, Dept Expt Pathol, Kyoto 6068507, Japan .
Field:	IMMUNOLOGY

HIGHLY CITED PAPERS FOR CITY UNIV HONG KONG	
Sorted by: Citations <input type="button" value="SORT AGAIN"/>	
1 - 20 (of 92) Page 1 of 5	
1 Citations: 200	<input type="button" value="WEB OF SCIENCE"/>
Title:	SILICON NANOWIRES PREPARED BY LASER ABLATION AT HIGH TEMPERATURE
Authors:	ZHANG YF ; TANG YH ; WANG N ; YU DP ; LEE CS ; BELLO F ; LEE ST
Source:	APPL PHYS LETT 72 (15): 1835-1837 APR 13 1998
Addresses:	City Univ Hong Kong , Dept Phys & Mat Sci, Kowloon, Hong Kong .
Field:	PHYSICS
2 Citations: 187	<input type="button" value="WEB OF SCIENCE"/>
Title:	RECENT PROGRESS OF MOLECULAR ORGANIC ELECTROLUMINESCENT MATERIALS AND DEVICES

Click to view the full record in *Web of Science*.

Click to view other highly cited papers related to this paper.

Click to view the graph on the number of citations over the last 10 years.

Graph data is available by clicking on the [View table of graph data](#) link in the Graph page.

Click on the linked items to view the field rankings for the author, source, or address.

CITATION ANALYSIS

Baselines: These are measures of cumulative citation frequency across large groups of papers that provide expected citation rates for groups of papers. You can obtain baselines by Average Citation Rates, Percentiles, and Field Rankings.

Research Fronts: This is a group of related highly cited papers (known as *core papers*) in a specialized topic defined by cluster analysis. These papers indicate current areas of intensive and breakthrough research.

Baselines

Allows you to access the following tables:

- **Average Citation Rates:** Calculated for each year of the 10-year period covered in *Essential Science Indicators*.
- **Percentiles:** Shows the citation count threshold for six different percentile cuts for each field and year.
- **Field Rankings:** Displays papers and citations data on all fields covering all years in the product's database.

BASELINES MENU	
BY AVERAGES:	View the average citation rates table. ①
OR	
BY PERCENTILES:	View the percentiles table. ②
OR	
BY FIELD RANKINGS:	View field rankings table. ③

①

Average Citation Rates for papers published by field, 1997 - 2007 (How to read this data)												
Fields	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	All Years
All Fields	15.80	14.93	13.98	12.83	11.22	9.37	7.19	5.02	2.57	0.55	0.05	8.75
Agricultural Sciences	8.95	8.96	8.52	8.14	6.91	5.70	4.55	2.99	1.41	0.28	0.06	5.21
Biology & Biochemistry	27.37	25.03	23.05	21.42	18.53	15.18	11.72	8.07	4.07	0.85	0.04	15.07
Chemistry	13.99	13.84	12.84	12.32	10.52	9.39	7.30	5.26	2.82	0.61	0.03	8.30
Clinical Medicine	18.41	17.47	16.45	15.10	13.36	11.38	8.94	6.21	3.22	0.67	0.06	10.59
Computer Science	5.70	5.83	5.11	4.48	4.45	4.18	2.35	1.41	0.72	0.14	0.02	2.53
Economics & Business	8.91	7.79	6.80	5.94	4.89	4.23	2.98	1.89	0.84	0.19	0.05	4.23

This table shows the average number of citations recorded per paper in each field over the past 10 years.

②

Percentiles for papers published by field, 1997 - 2007 (How to read this data)												
All Fields	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	All Years
0.01 %	1194	1256	950	869	762	627	463	286	160	47	8	769
0.10 %	443	417	371	328	285	232	175	117	64	18	4	275
1.00 %	147	138	127	115	99	81	61	43	23	7	2	90
10.00 %	37	35	33	31	27	23	18	13	7	2	1	22
20.00 %	21	20	19	18	16	13	11	8	4	1	0	12
50.00 %	7	6	6	6	5	5	4	3	2	1	0	3
Agricultural Sciences	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	All Years
0.01 %	308	471	270	360	203	238	186	134	46	10	6	220
0.10 %	147	166	141	135	120	81	72	42	24	7	6	113
1.00 %	68	70	66	60	48	38	33	20	11	4	2	46
10.00 %	23	22	22	20	18	14	12	8	4	2	1	14
20.00 %	14	14	14	13	11	9	8	5	3	1	0	8
50.00 %	5	5	5	5	4	4	3	2	1	0	0	2
Biology & Biochemistry	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	All Years

This table shows how many citations a paper needs to receive to be in a specific citation range.

③

Field Rankings					
Sorted by: Citations <input type="button" value="SORT AGAIN"/>					
	View	Field	Papers	Citations	Citations Per Paper
1		CLINICAL MEDICINE	1,779,573	18,842,621	10.59
2		CHEMISTRY	1,017,181	8,440,704	8.30
3		BIOLOGY & BIOCHEMISTRY	518,746	7,818,848	15.07
4		PHYSICS	824,734	5,915,891	7.17
5		MOLECULAR BIOLOGY & GENETICS	243,029	5,746,239	23.64
6		NEUROSCIENCE & BEHAVIOR	269,009	4,374,156	16.26

This table shows the rankings of each field based on citation.

Sort by Citations, Papers, Citations per Paper, or Field to view the rankings of all fields in these categories.

Research Fronts

Research fronts offer an alternative classification scheme for highly cited papers since the assignment of papers to a research front is not based on the journal categories used in *Essential Science Indicators*.

Use the Research Fronts menu to find new trends in a specific field of research (or all fields) or on a topic:

RESEARCH FRONTS MENU

BY FIELD: Select a topic from this field:

OR

BY NAME: Enter up to five terms or phrases separated by the operators AND or OR to search.
Example: BREAST CANCER ([more examples](#))

RESEARCH FRONTS RANKINGS IN ENGINEERING

Sorted by: Citations

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View	Fronts	Papers	Citations	Citations Per Paper	Mean Year
1	MULTI-WALLED CARBON NANOTUBES MODIFIED ELECTRODE; GLUCOSE OXIDASE USING ALIGNED SINGLE WALLED CARBON NANOTUBE ARRAYS; PROTEIN ELECTROCHEMISTRY USING ALIGNED CARBON NANOTUBE ARRAYS; GLASSY CARBON ELECTRODE MODIFIED	18	1,978	109.89	2003.1
2	RAPID ACCURATE MASS DESORPTION ELECTROSPRAY IONISATION TANDEM MASS SPECTROMETRY; AMBIENT MASS SPECTROMETRY USING DESORPTION ELECTROSPRAY IONIZATION (DESI); MASS SPECTROMETRY COUPLED USING DESORPTION ELECTROSPRAY IONIZATION	41	1,463	35.68	2005.0
3	LAYERED LITHIUM INSERTION MATERIAL; ADVANCED LITHIUM-ION BATTERIES; LAYERED CATHODE MATERIALS LITHIUM-ION BATTERIES; LAYERED	15	1,227	81.80	2002.5

Click to view core papers.

Click to view the graph on the number of core papers over the past 5 years. This graph in addition to the mean year can give an indication of the currency of the area.


Graph data is available by clicking on the [View table of graph data](#) link in the Graph page.

The citations per paper indicates the intensity and focus of the areas.

A recent mean year indicates that the area is based on current findings and is likely to be a hot area of research.

The number of highly cited papers and citing papers gives an indication of the size of the research area.

Online Help

Detailed online help is available by clicking on the help button () at the top left hand corner in every menu and ranking page.

Quit

Close the browser after use.