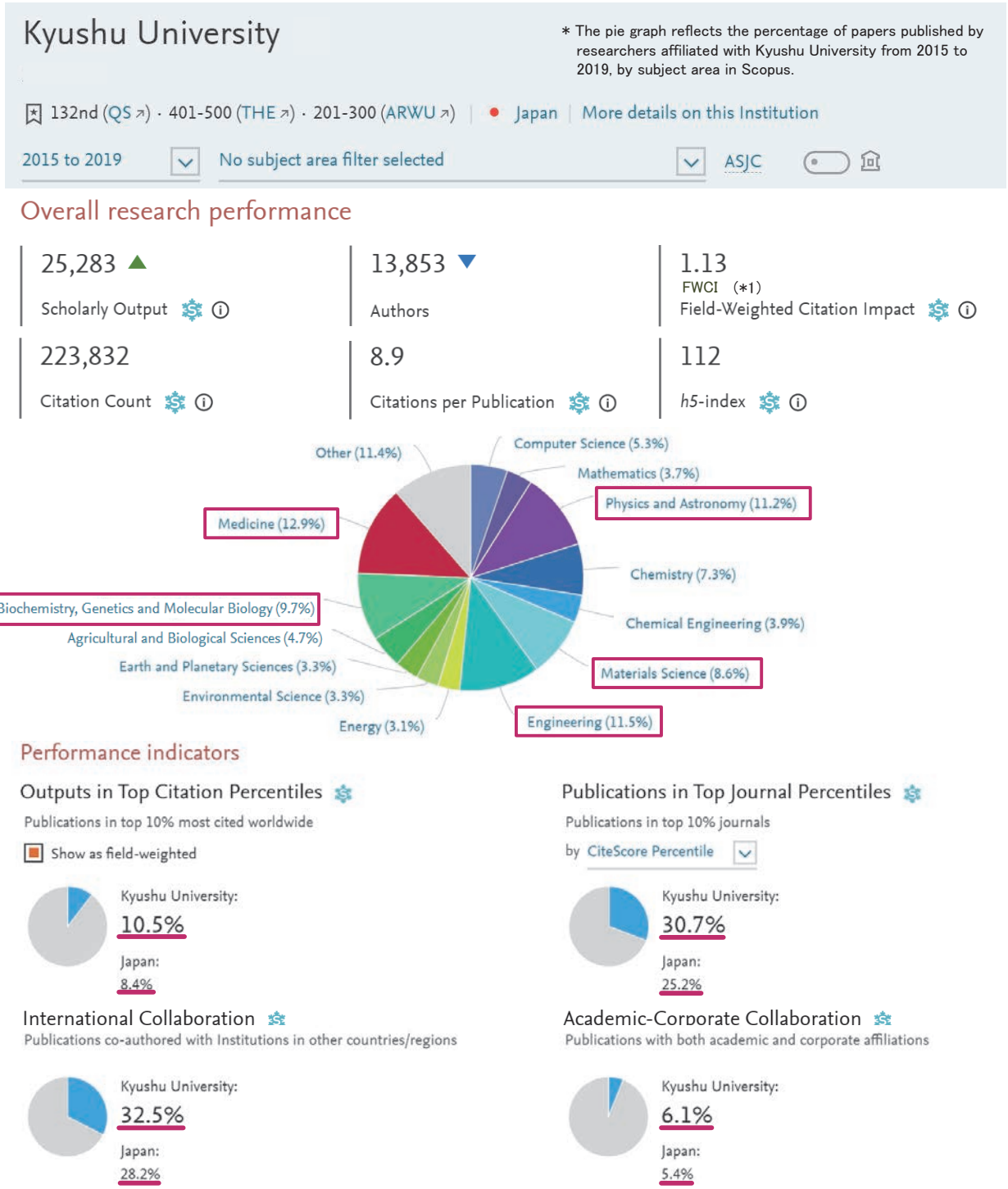
9. Research

9-1. Trends across Kyushu University as a Whole Based on Field Classification of Journals

A high percentage of Kyushu University papers are published in the fields of Medicine, Engineering, Physics and Astronomy, Biochemistry, Genetics and Molecular Biology, as well as Materials Science. Kyushu University also had a higher percentage than Japan's national average in the folllowing: publications in global top 10% citation percentiles and journal percentiles, as well as international and academic-corporate collaborations.



(*1) FWCI (Field-Weighted Citation Impact) is the number of citations received by the publication, divided by the world average for the same type of publications in the same field and same publication year. An FWCI of 1 or higher means that the average impact is higher than the world average.

*Source: Elsevier's "SciVal" (as of September 2020)

■ Topic Prominence: Analysis of University Strengths Based on Co-citation of Publications

According to SciVal's Topic Prominence function, from 2015 to 2019, there were 9,213 topics of research in fields that are attracting attention. The data in the chart below reflects the topics of research considered to be in the top 1%. These topics are clustered in the fields of Physics and Astronomy, Chemistry, Chemical Engineering, Materials Science, Engineering, Energy Science, and Medicine. In these fields, the following Key Topics (*1) are where Kyushu University has strong influence: 1. Top Quarks, 2. Organic Light-emitting Diodes (OLED), 3. Hydrogen Embrittlement, 4. Equal-channel Angular Pressing (ECAP), 5. Hydrogen Storage, 6. Heat Absorption, 7. Fuel Cells, 8. Autophagosomes, 9. Mitochondrial Dynamics, and 10. Cryptochromes. The above topics are said to be among Kyushu University's most active research projects, with the university's global output share and number of papers trending high.

The Most Prominent 1% of Topics (2015-2019)

① **Top Quark, Parton, Higgs Bosons**
Prominence percentile: 99.950
No. of Kyushu U publications and global share: 332; 13.53%
No. of Kyushu U citations and global share: 10,344; 30.95%

② **Organic Light-Emitting Diodes, 1HPhenanthro (9,10-d) Imidazoles, Tris (2-Phenylpyridine) Iridium (III)**
Prominence percentile: 99.926
No. of Kyushu U publications and global share: 139; 4.07%
No. of Kyushu U citations and global share: 6,322; 10.27%

③ **Hydrogen Embrittlement, Fatigue Crack Growth, Martensitic Stainless Steels**
Prominence percentile: 99.048
No. of Kyushu U publications and global share: 168; 9.99%
No. of Kyushu U citations and global share: 2,118; 17.75%

④ **Equal-Channel Angular Pressing, Superplasticity, Grain Refinement**
Prominence percentile: 99.373
No. of Kyushu U publications and global share: 63; 2.96%
No. of Kyushu U citations and global share: 1,286; 9.24%

⑤ **Hydrogen Storage, Hydride, Dehydrogenation**
Prominence percentile: 99.096
No. of Kyushu U publications and global share: 24; 2.12%
No. of Kyushu U citations and global share: 634; 4.82%

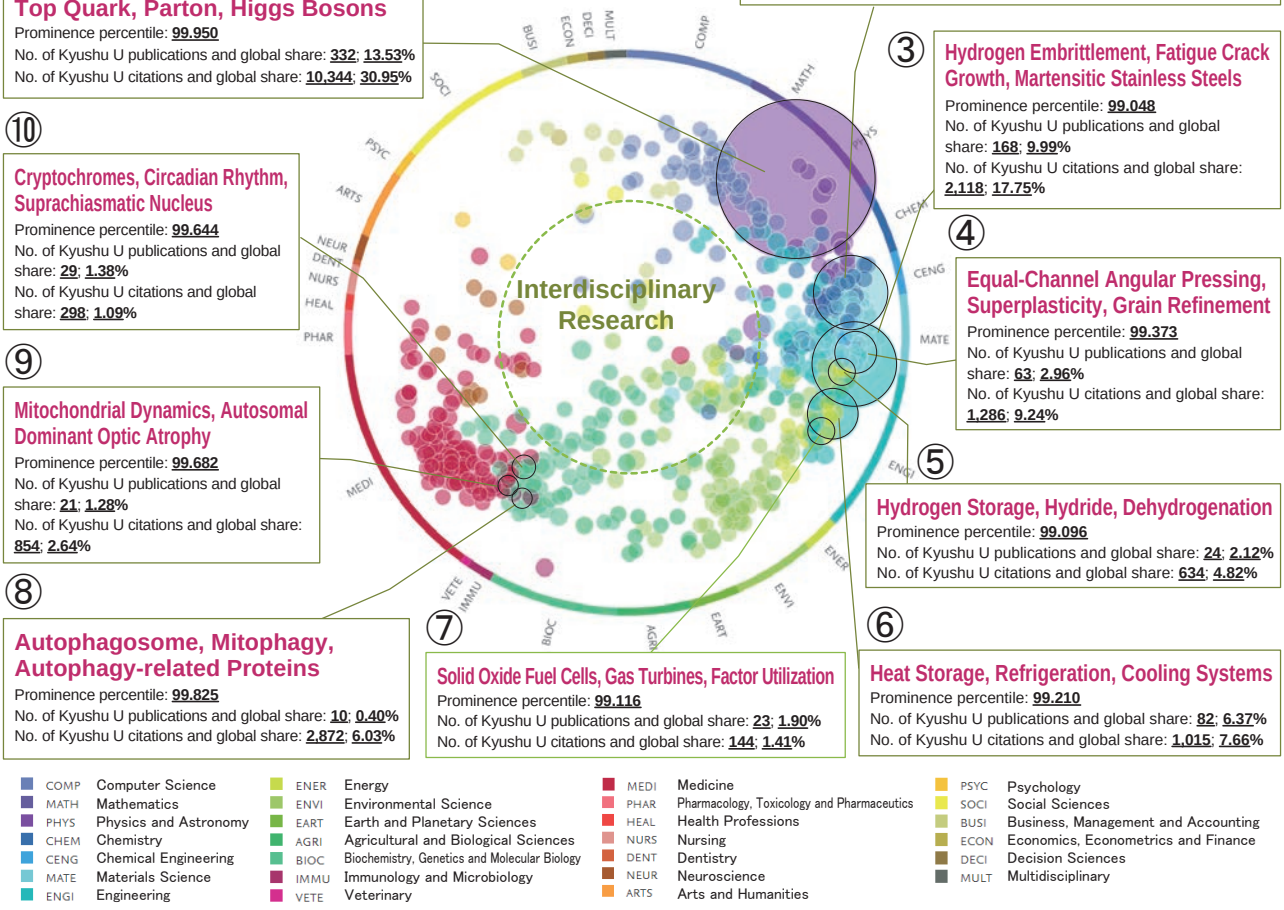
⑥ **Heat Storage, Refrigeration, Cooling Systems**
Prominence percentile: 99.210
No. of Kyushu U publications and global share: 82; 6.37%
No. of Kyushu U citations and global share: 1,015; 7.66%

⑦ **Solid Oxide Fuel Cells, Gas Turbines, Factor Utilization**
Prominence percentile: 99.116
No. of Kyushu U publications and global share: 23; 1.90%
No. of Kyushu U citations and global share: 144; 1.41%

⑧ **Autophagosome, Mitophagy, Autophagy-related Proteins**
Prominence percentile: 99.825
No. of Kyushu U publications and global share: 10; 0.40%
No. of Kyushu U citations and global share: 2,872; 6.03%

⑨ **Mitochondrial Dynamics, Autosomal Dominant Optic Atrophy**
Prominence percentile: 99.682
No. of Kyushu U publications and global share: 21; 1.28%
No. of Kyushu U citations and global share: 854; 2.64%

⑩ **Cryptochromes, Circadian Rhythm, Suprachiasmatic Nucleus**
Prominence percentile: 99.644
No. of Kyushu U publications and global share: 29; 1.38%
No. of Kyushu U citations and global share: 298; 1.09%



・An Overview of the Topic Prominence Function
This function uses citation links to documents in Scopus and clusters them into around 97,000 topics, ranked by Prominence. The new Prominence indicator shows the most recent citation count for documents, the display count and the level of interest. Prominence is correlated with grants, and helps researchers and research managers identify topics that are highly likely to see an increase in funding. The closer a topic as to the center of the circle, the more interdisciplinary it is. (Excerpted from Elsevier Quick Reference Guide, January 2018)

(*1) Key Topic
Kyushu University publications and/or citations that exceed 1/3 of the most frequently cited topics are designated as Key Topics by SciVal. Due to their high share of references and number of papers, these topics are said to enhance the influence of Kyushu University.

◆Perspectives◆
・Each circle represents a topic.
・Circumference indicates research fields used in Scopus (ASJC 27 major subject areas) by color.
・Color of circle: For the fields of the publications that make up the topics, the fields that make the highest proportion of the total are displayed in the color of the fields located around the circumference.
・Size of circle indicates the output of the entity in the topic.
・Position of the circle is based upon the ASJC categories of the journals in which the scholarly output is published. Topics closer to the center of the wheel are more likely to be multidisciplinary.

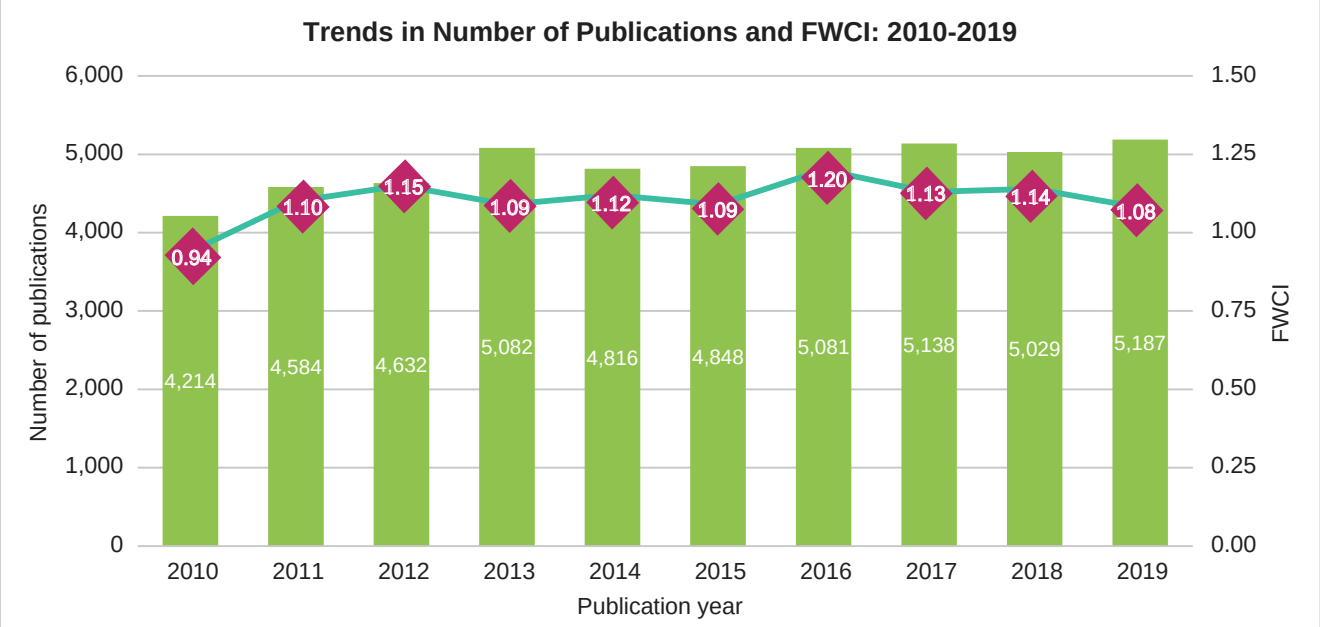
*Source: Elsevier's "SciVal" (as of September 2020)

9-2. Comparisons of Publication Quantity and Quality

■ Trends in Number of Publications and FWCI

In 2013, Kyushu University published more than 5,000 papers for the first time, and it has maintained this level ever since. In 2011, Kyushu University's FWCI (*1) value exceeded the global average of 1.0, rising to a high of 1.2 in 2016, but our FWCI has been declining since.

◆ Kyushu University ◆



◆ Comparisons with Other Universities ◆

Scholarly Output

Rank	University	Number
1	The University of Tokyo	61,058
2	Kyoto University	41,624
3	Tohoku University	31,465
4	Osaka University	29,651
5	Kyushu University	25,283
6	Nagoya University	24,763
7	Hokkaido University	21,984
8	Tokyo Institute of Technology	19,414
9	University of Tsukuba	17,255
10	Keio University	16,718

(2015-2019)

Citation Count

Rank	University	Citation Count	Average Citations per Publication
1	The University of Tokyo	650,786	10.7
2	Kyoto University	460,852	11.1
3	Tohoku University	280,863	8.9
4	Osaka University	272,971	9.2
5	Nagoya University	233,680	9.4
6	Kyushu University	223,832	8.9
7	Hokkaido University	183,752	8.4
8	Tokyo Institute of Technology	172,350	8.9
9	University of Tsukuba	154,584	9.0
10	Keio University	137,158	8.2

(2015-2019)

FWCI

Rank	University	FWCI
1	Kyoto University	1.36
2	The University of Tokyo	1.33
3	University of Tsukuba	1.19
4	Nagoya University	1.18
5	Tokyo Institute of Technology	1.14
6	Kyushu University	1.13
6	Osaka University	1.13
8	Keio University	1.11
9	Waseda University	1.10
9	Tohoku University	1.10

(2015-2019)

・RU11 (Research University 11) is a consortium that aims to develop academia via eleven universities: Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University, and Kyushu University. RU11 is composed of both national and private universities.

(*1) FWCI (Field-Weighted Citation Impact) is the number of citations received by the publication, divided by the world average for the same type of publications in the same field and same publication year. An FWCI of 1 or higher means that the average impact is higher than the world average.

*Source: Elsevier's "SciVal" (as of September 2020)

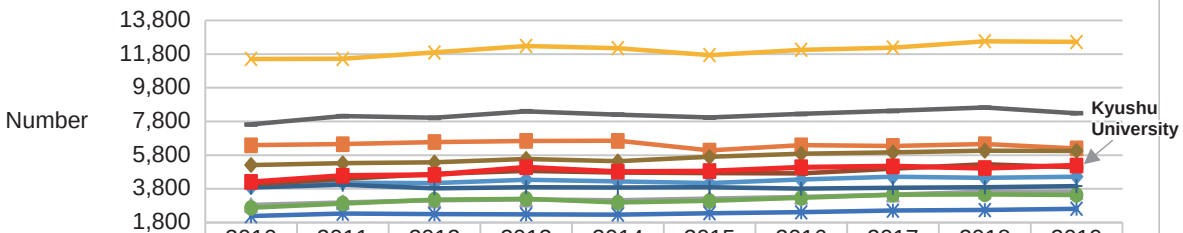
9-2. Comparisons of Publication Quantity and Quality (Continued)

For each university in the the RU11 (*1), the quantity of published papers was compared over the past decade. Although the number of papers published by Kyushu University rose from about 4,200 to over 5,000 per year, our RU11 ranking has remained stable. Regarding FWCI (*2), Kyushu University has surpassed the global average of 1.0 since 2011.

◆Comparison of the RU11◆

(All publication types included)

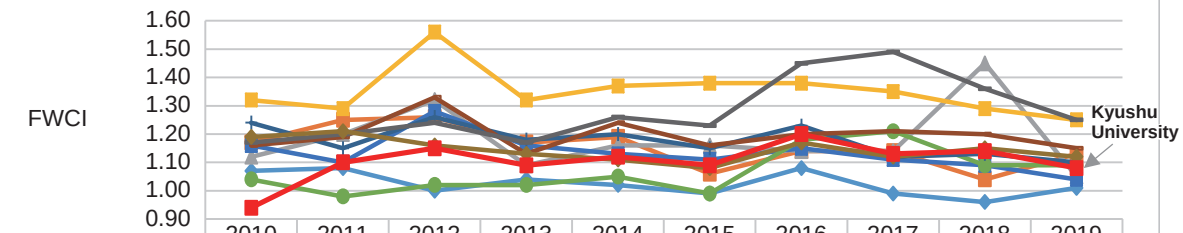
Comparison of the Number of RU11 Publications: 2010-2019



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hokkaido University	3,906	4,164	4,141	4,344	4,232	4,141	4,353	4,517	4,453	4,520
Tohoku University	6,392	6,457	6,577	6,644	6,652	6,073	6,386	6,346	6,458	6,202
University of Tsukuba	2,839	2,991	3,117	3,166	3,117	3,214	3,326	3,455	3,636	3,624
The University of Tokyo	11,511	11,516	11,892	12,279	12,148	11,741	12,051	12,181	12,564	12,521
Waseda University	2,183	2,327	2,294	2,284	2,272	2,355	2,412	2,513	2,543	2,619
Keio University	2,676	2,933	3,157	3,210	2,988	3,082	3,267	3,454	3,473	3,442
Tokyo Institute of Technology	3,882	4,048	3,831	3,900	3,874	3,891	3,807	3,861	3,888	3,967
Nagoya University	4,056	4,382	4,686	4,860	4,764	4,725	4,715	4,997	5,254	5,072
Kyoto University	7,620	8,116	8,020	8,404	8,205	8,032	8,249	8,429	8,623	8,291
Osaka University	5,212	5,319	5,366	5,578	5,437	5,699	5,882	5,958	6,061	6,051
Kyushu University	4,214	4,584	4,632	5,082	4,816	4,848	5,081	5,138	5,029	5,187

(Self-citations included)

Comparison of RU11 FWCI: 2010-2019



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hokkaido University	1.07	1.08	1.00	1.04	1.02	0.99	1.08	0.99	0.96	1.01
Tohoku University	1.17	1.25	1.26	1.17	1.19	1.06	1.14	1.14	1.04	1.13
University of Tsukuba	1.12	1.20	1.32	1.09	1.16	1.16	1.14	1.14	1.45	1.05
The University of Tokyo	1.32	1.29	1.56	1.32	1.37	1.38	1.38	1.35	1.29	1.25
Waseda University	1.16	1.10	1.28	1.16	1.13	1.11	1.15	1.11	1.09	1.04
Keio University	1.04	0.98	1.02	1.02	1.05	0.99	1.18	1.21	1.09	1.09
Tokyo Institute of Technology	1.24	1.15	1.26	1.18	1.20	1.15	1.23	1.12	1.13	1.10
Nagoya University	1.16	1.19	1.33	1.13	1.24	1.16	1.20	1.21	1.20	1.15
Kyoto University	1.17	1.20	1.24	1.17	1.26	1.23	1.45	1.49	1.36	1.25
Osaka University	1.19	1.21	1.16	1.13	1.11	1.08	1.17	1.12	1.15	1.12
Kyushu University	0.94	1.10	1.15	1.09	1.12	1.09	1.20	1.13	1.14	1.08

(*1) RU11 (Research University 11) is a consortium that aims to develop academia via eleven universities: Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University, and Kyushu University. RU11 is composed of both national and private universities.

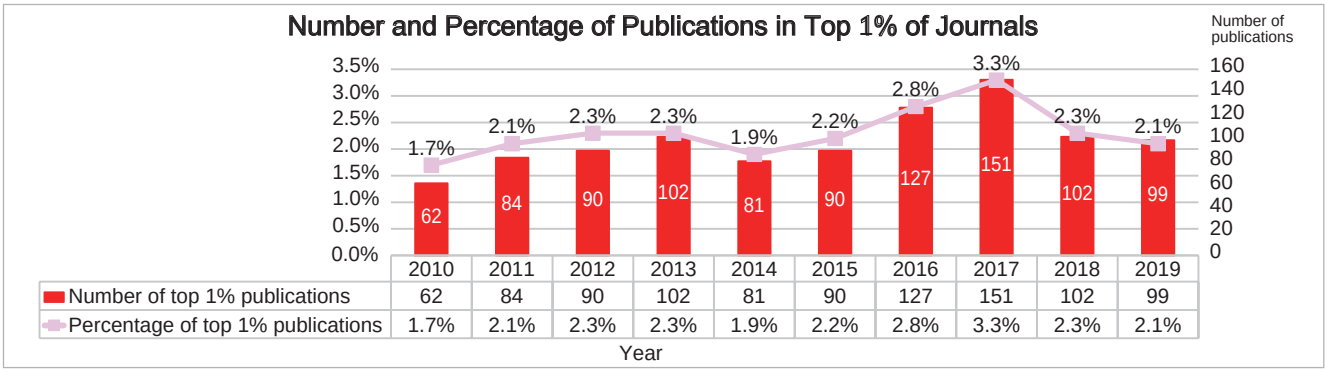
(*2) FWCI (Field-Weighted Citation Impact) is the number of citations received by the publication, divided by the world average for the same type of publications in the same field and same publication year. An FWCI of 1 or higher means that the average impact is higher than the world average.

*Source: Elsevier's "SciVal" (as of September 2020)

■ Trends in the Number and Percentage of Publications Carried in the World's Top Journals

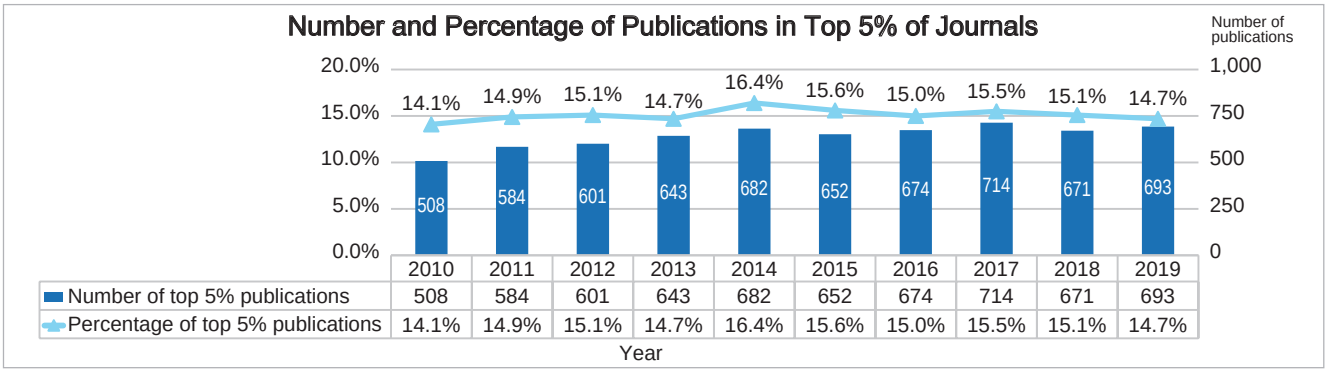
The number of Kyushu University papers published in the top 5, 10, and 25 percent of journals has been rising over the long term. Among the top 25 % of journals, Kyushu University maintains a publication rate of over 50%, meaning a majority of our papers are printed in influential periodicals.

◆Comparison of the RU11◆



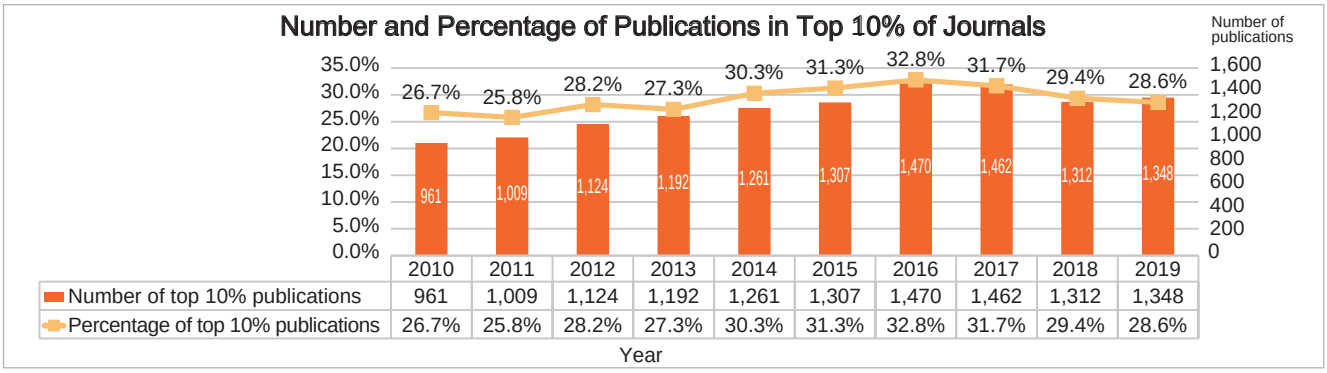
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of top 1% publications	62	84	90	102	81	90	127	151	102	99
Percentage of top 1% publications	1.7%	2.1%	2.3%	2.3%	1.9%	2.2%	2.8%	3.3%	2.3%	2.1%

Year



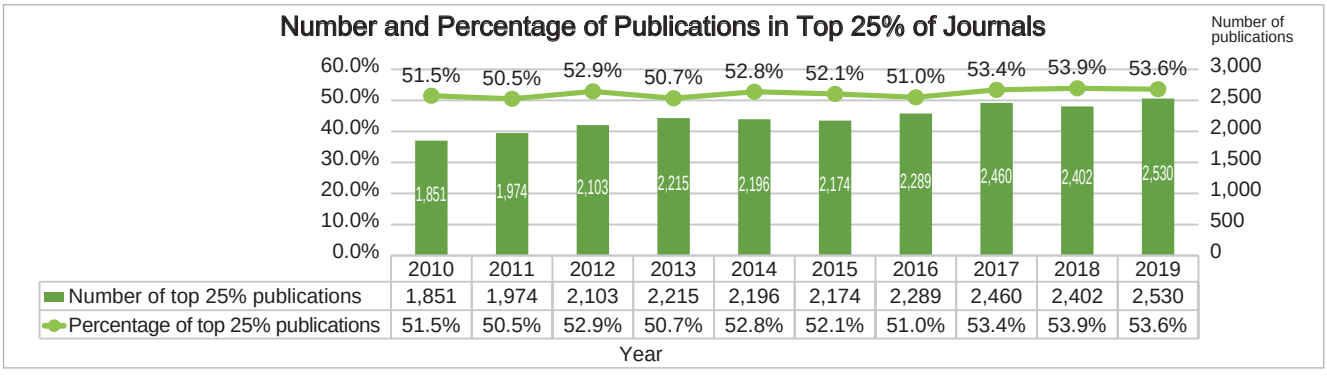
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of top 5% publications	508	584	601	643	682	652	674	714	671	693
Percentage of top 5% publications	14.1%	14.9%	15.1%	14.7%	16.4%	15.6%	15.0%	15.5%	15.1%	14.7%

Year



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of top 10% publications	961	1,009	1,124	1,192	1,261	1,307	1,470	1,462	1,312	1,348
Percentage of top 10% publications	26.7%	25.8%	28.2%	27.3%	30.3%	31.3%	32.8%	31.7%	29.4%	28.6%

Year



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Number of top 25% publications	1,851	1,974	2,103	2,215	2,196	2,174	2,289	2,460	2,402	2,530
Percentage of top 25% publications	51.5%	50.5%	52.9%	50.7%	52.8%	52.1%	51.0%	53.4%	53.9%	53.6%

Year

・What do we mean by the number and percentage of publications carried in journals in top percentiles?
The number and percentage of publications carried in journals in top percentiles, based on citation counts. It indicates the number of publications in the top 1%, 5%, 10%, and 25% of journals based on the number and percentage of citations in Scopus each year.

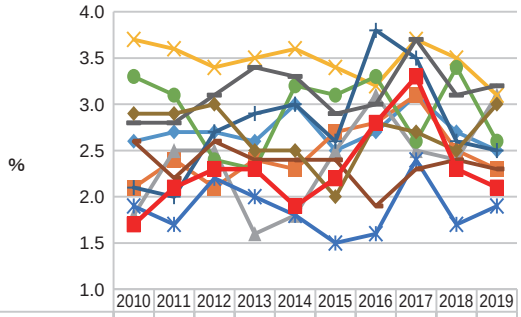
*Source: Elsevier's "SciVal" (as of September 2020)

9-2. Comparisons of Publication Quantity and Quality (Continued)

For each university in the the RU11 (*1), we compared the number of papers published in prominent journals. Kyushu University's publication rate, especially in the top 10% of journals, was rising until 2016, but it has been trending downard since then.

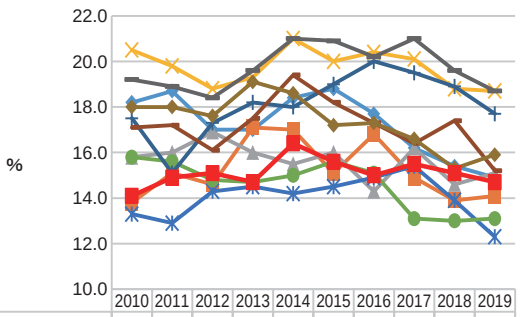
◆Comparison of the RU11◆

Percentage of Publications in Top 1% of Journals



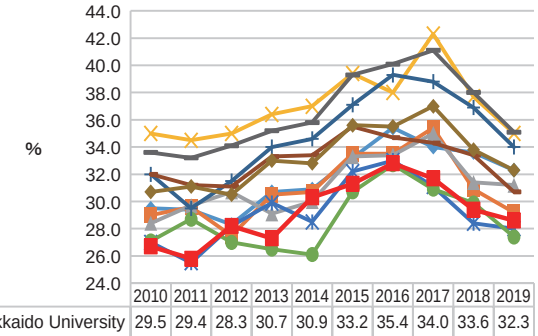
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hokkaido University	2.6	2.7	2.7	2.6	3.0	2.5	2.7	3.1	2.7	2.5
Tohoku University	2.1	2.4	2.1	2.4	2.3	2.7	2.8	3.1	2.5	2.3
University of Tsukuba	1.8	2.5	2.5	1.6	1.8	2.5	3.1	2.5	2.4	3.1
The Universityof Tokyo	3.7	3.6	3.4	3.5	3.6	3.4	3.2	3.7	3.5	3.1
Waseda University	1.9	1.7	2.2	2.0	1.8	1.5	1.6	2.4	1.7	1.9
Keio University	3.3	3.1	2.4	2.3	3.2	3.1	3.3	2.6	3.4	2.6
Tokyo Institute of Technology	2.1	2.0	2.7	2.9	3.0	2.6	3.8	3.5	2.6	2.5
Nagoya University	2.6	2.2	2.6	2.4	2.4	2.4	1.9	2.3	2.4	2.3
Kyoto University	2.8	2.8	3.1	3.4	3.3	2.9	3.0	3.7	3.1	3.2
Osaka University	2.9	2.9	3.0	2.5	2.5	2.0	2.8	2.7	2.5	3.0
Kyushu University	1.7	2.1	2.3	2.3	1.9	2.2	2.8	3.3	2.3	2.1

Percentage of Publications in Top 5% of Journals



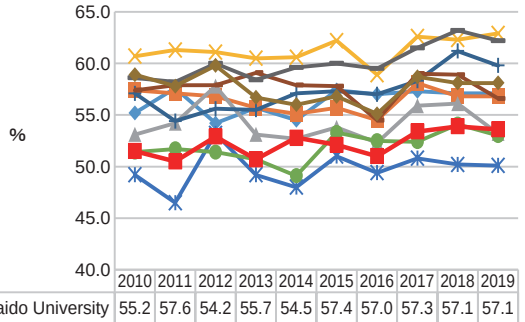
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hokkaido University	18.2	18.7	17.0	17.0	18.4	18.8	17.7	16.2	15.4	14.9
Tohoku University	13.8	15.1	14.6	17.1	17.0	15.1	16.8	14.9	13.9	14.1
University of Tsukuba	15.8	16.0	16.9	16.0	15.5	16.0	14.3	16.2	14.6	15.1
The Universityof Tokyo	20.5	19.8	18.8	19.3	21.0	20.0	20.4	20.1	18.8	18.7
Waseda University	13.3	12.9	14.3	14.5	14.2	14.5	14.9	15.4	13.9	12.3
Keio University	15.8	15.6	14.8	14.7	15.0	15.6	15.1	13.1	13.0	13.1
Tokyo Institute of Technology	17.5	15.1	17.3	18.2	18.0	19.0	20.0	19.5	18.9	17.7
Nagoya University	17.1	17.2	16.1	17.5	19.4	18.2	17.3	16.4	17.4	15.2
Kyoto University	19.2	18.9	18.4	19.6	21.0	20.9	20.2	21.0	19.6	18.7
Osaka University	18.0	18.0	17.6	19.1	18.6	17.2	17.3	16.6	15.3	15.9
Kyushu University	14.1	14.9	15.1	14.7	16.4	15.6	15.0	15.5	15.1	14.7

Percentage of Publications in Top 10% of Journals



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hokkaido University	29.5	29.4	28.3	30.7	30.9	33.2	35.4	34.0	33.6	32.3
Tohoku University	29.0	29.6	27.5	30.5	30.7	33.5	33.5	35.4	30.9	29.2
University of Tsukuba	28.4	29.7	30.7	29.1	30.0	33.3	33.4	35.0	31.4	31.2
The Universityof Tokyo	35.0	34.5	35.0	36.4	37.0	39.4	38.0	42.3	37.7	35.0
Waseda University	27.0	25.5	28.2	29.9	28.5	32.2	33.0	31.1	28.4	28.0
Keio University	27.1	28.7	27.0	26.5	26.1	30.7	32.7	30.9	29.9	27.4
Tokyo Institute of Technology	32.0	29.5	31.5	34.0	34.6	37.1	39.3	38.8	36.9	34.0
Nagoya University	32.0	31.2	31.1	33.3	33.4	35.5	34.7	34.3	33.4	30.7
Kyoto University	33.6	33.2	34.1	35.2	35.8	39.3	40.1	41.1	38.0	35.1
Osaka University	30.7	31.1	30.5	33.0	32.8	35.6	35.5	37.0	33.8	32.3
Kyushu University	26.7	25.8	28.2	27.3	30.3	31.3	32.8	31.7	29.4	28.6

Percentage of Publications in Top 25% of Journals



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hokkaido University	55.2	57.6	54.2	55.7	54.5	57.4	57.0	57.3	57.1	57.1
Tohoku University	57.4	57.1	56.8	55.7	55.1	55.7	54.5	58.1	56.8	56.8
University of Tsukuba	53.1	54.2	57.8	53.1	52.7	53.8	52.3	55.9	56.1	53.2
The Universityof Tokyo	60.7	61.3	61.1	60.5	60.6	62.2	58.9	62.6	62.3	62.9
Waseda University	49.2	46.5	53.2	49.2	48.0	51.0	49.4	50.8	50.2	50.1
Keio University	51.4	51.7	51.4	50.7	49.1	53.3	52.5	52.4	54.1	53.0
Tokyo Institute of Technology	57.1	54.4	55.6	55.5	57.1	57.3	57.0	58.3	61.2	59.8
Nagoya University	57.4	57.9	57.9	59.1	57.9	57.8	54.5	59.0	58.9	56.6
Kyoto University	58.6	58.2	60.0	58.4	59.6	60.0	59.5	61.5	63.2	62.2
Osaka University	58.9	57.8	59.8	56.7	56.0	56.8	55.1	58.7	58.1	58.1
Kyushu University	51.5	50.5	52.9	50.7	52.8	52.1	51.0	53.4	53.9	53.6

(*1) RU11 (Research University 11) is a consortium that aims to develop academia via eleven universities: Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University, and Kyushu University. RU11 is composed of both national and private universities.

*Source: Elsevier's "SciVal" (as of September 2020)

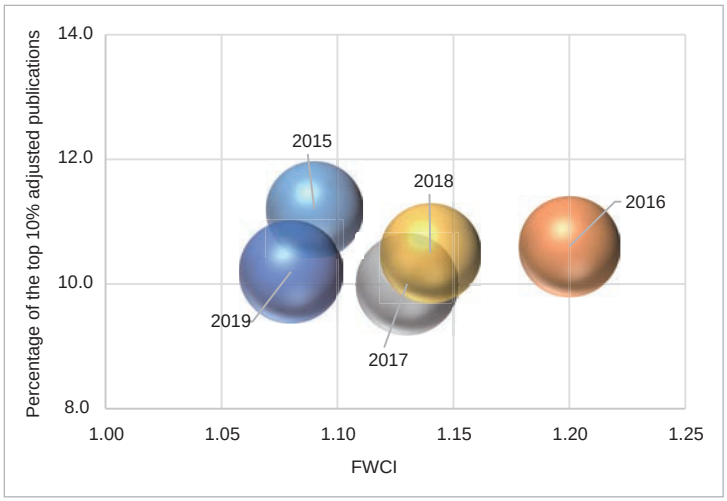
■ Overall Comparisons of Publication Quantity and Quality

In the scatter diagram below, the higher and further to the right a bubble is, the higher the quality of publications. By publishing around 5,000 papers per year, Kyushu University is trending into the top 10% of adjusted publications (*1). Furthermore, when compared among the RU11 (*2) universities, we are ranked 8th among the top 10% of adjusted papers. However, by ranking 5th for number of papers and a 6th in FWCI (*3), Kyushu University publications rank in the middle of RU11 universities, both in terms of quality and quantitiy.

◆Kyushu University◆ (2015-2019)

Percentage of the Top 10% Adjusted Publications (Vertical Axis) × FWCI (Horizontal Axis) × Total Number of Publications (Bubble Size)

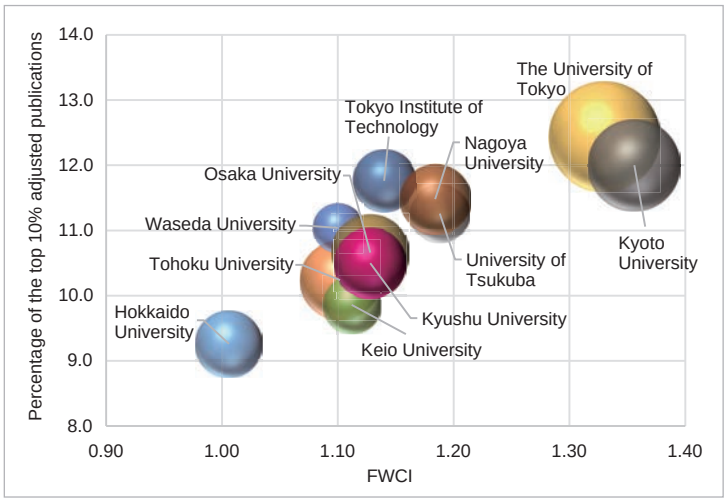
Year	Percentage of the top 10% adjusted publications	FWCI	Number of publications
2015	11.2	1.09	4,848
2016	10.6	1.20	5,081
2017	10.0	1.13	5,138
2018	10.5	1.14	5,029
2019	10.2	1.08	5,187
Average	10.5	1.13	5,057



◆Comparison of RU11◆ (2015-2019 Average)

Percentage of the Top 10% Adjusted Publications (Vertical Axis) × FWCI (Horizontal Axis) × Total Number of Publications (Bubble Size)

University	Percentage of the top 10% adjusted publications	FWCI	Number of publications
Hokkaido University	9.3	1.01	4,397
Tohoku University	10.2	1.10	6,293
University of Tsukuba	11.3	1.19	3,451
The University of Tokyo	12.4	1.33	12,212
Waseda University	11.0	1.10	2,488
Keio University	9.9	1.11	3,344
Tokyo Institute of Technology	11.8	1.14	3,883
Nagoya University	11.5	1.18	4,953
Kyoto University	12.0	1.36	8,325
Osaka University	10.7	1.13	5,930
Kyushu University	**10.5**	**1.13**	**5,057**



(*1) The Top 10% of Adjusted Publications
This refers to the number of (field-adjusted) papers cited in the world's top journals. This figure indicates the proportion of papers, including the top 10%, based on the annual number of Scopus citations.

(*2) RU11 (Research University 11) is a consortium that aims to develop academia via eleven universities: Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University, and Kyushu University. RU11 is composed of both national and private universities.

(*3) FWCI (Field-Weighted Citation Impact) is the number of citations received by the publication, divided by the world average for the same type of publications in the same field and same publication year. An FWCI of 1 or higher means that the average impact is higher than the world average.

*Source: Elsevier's "SciVal" (as of September 2020)

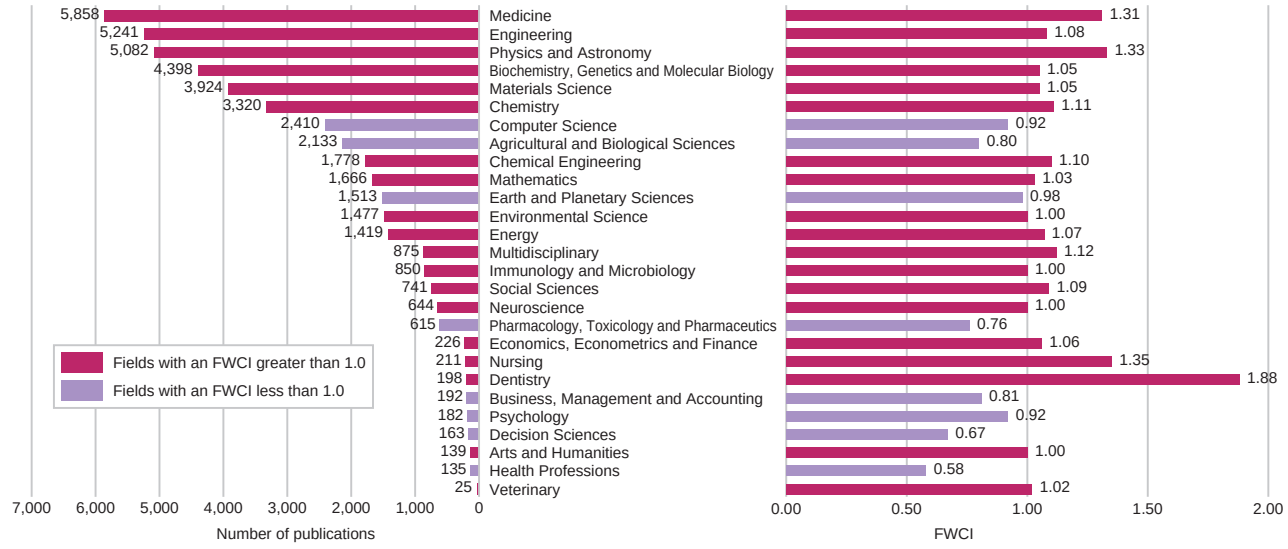
9-2. Comparisons of Publication Quantity and Quality (Continued)

■ Comparison between Kyushu University and the National Average by ASJC* 27 Subject Areas: FWCI

At Kyushu University, 19 out of 27 fields have received a FWCI (*1) ranking over the global average of 1. Compared to national FWCI values, the 5 fields that stand out among those 19 are Dentistry; Economics, Econometrics and Finance; Medicine; Physics and Astronomy; and Engineering. A larger number of publications and higher FWCI indicates greater depth of research capability (i.e. that it is one of the university's strengths). A smaller number of publications and high FWCI often indicates that there is a specific faculty member with advanced research ability. In addition, when a specific faculty member belongs to a huge community of researchers, both the number of publications and FWCI are often higher.

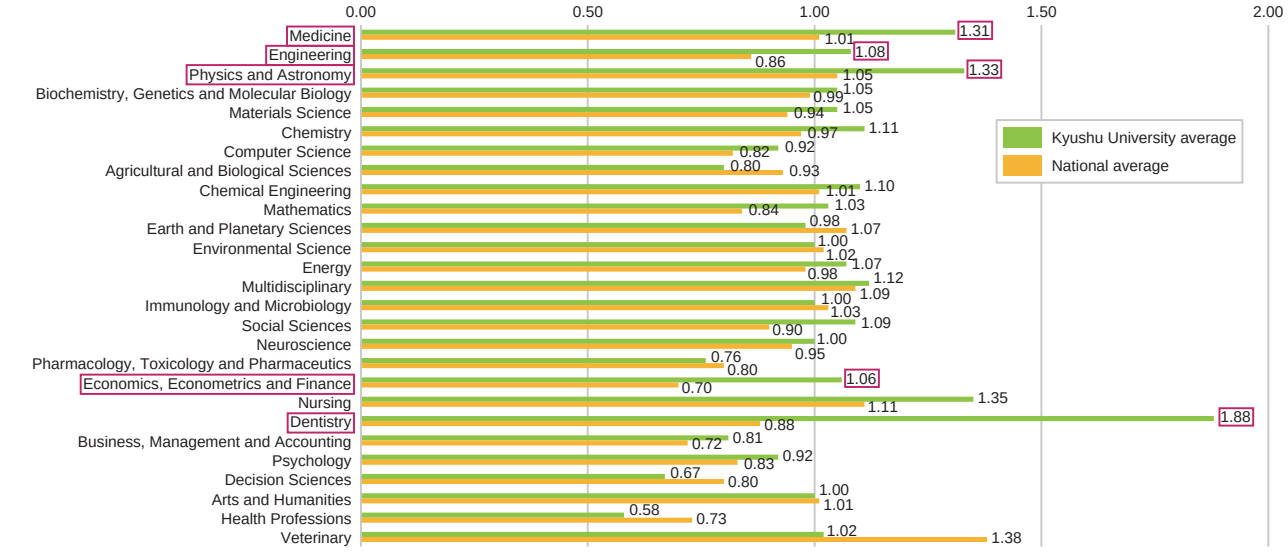
◆Kyushu University◆

Comparison of Number of Publications and FWCI by ASJC 27 Subject Areas (*2) : 2015-2019



◆Comparison between Kyushu University and the National Averages ◆

Comparison of FWCI by ASJC 27 Subject Areas: 2015-2019



(*1) FWCI (Field-Weighted Citation Impact) is the number of citations received by the publication, divided by the world average for the same type of publications in the same field and same publication year. An FWCI of 1 or higher means that the average impact is higher than the world average.

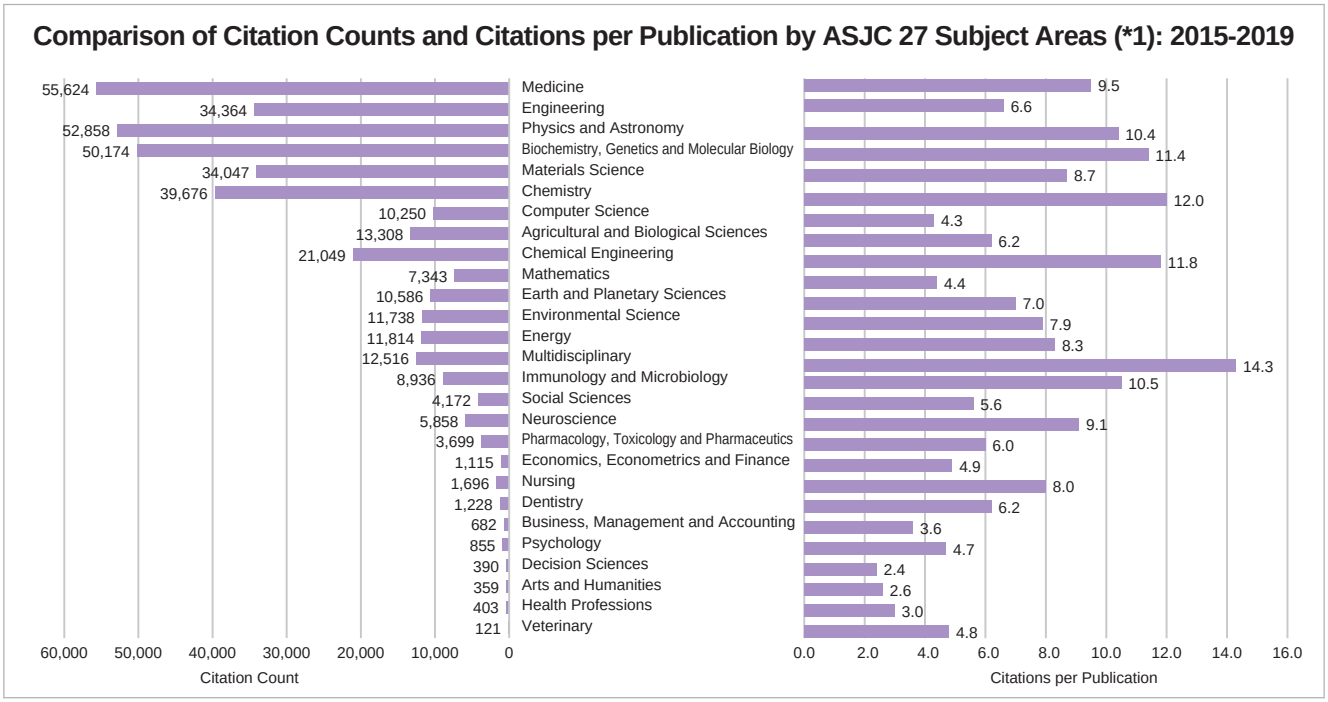
(*2) The above journal categories are based on the ASJC 27 (ASJC: All Scopus Science Journal Classification) in Scopus.

*Source: Elsevier's "SciVal" (as of September 2020)

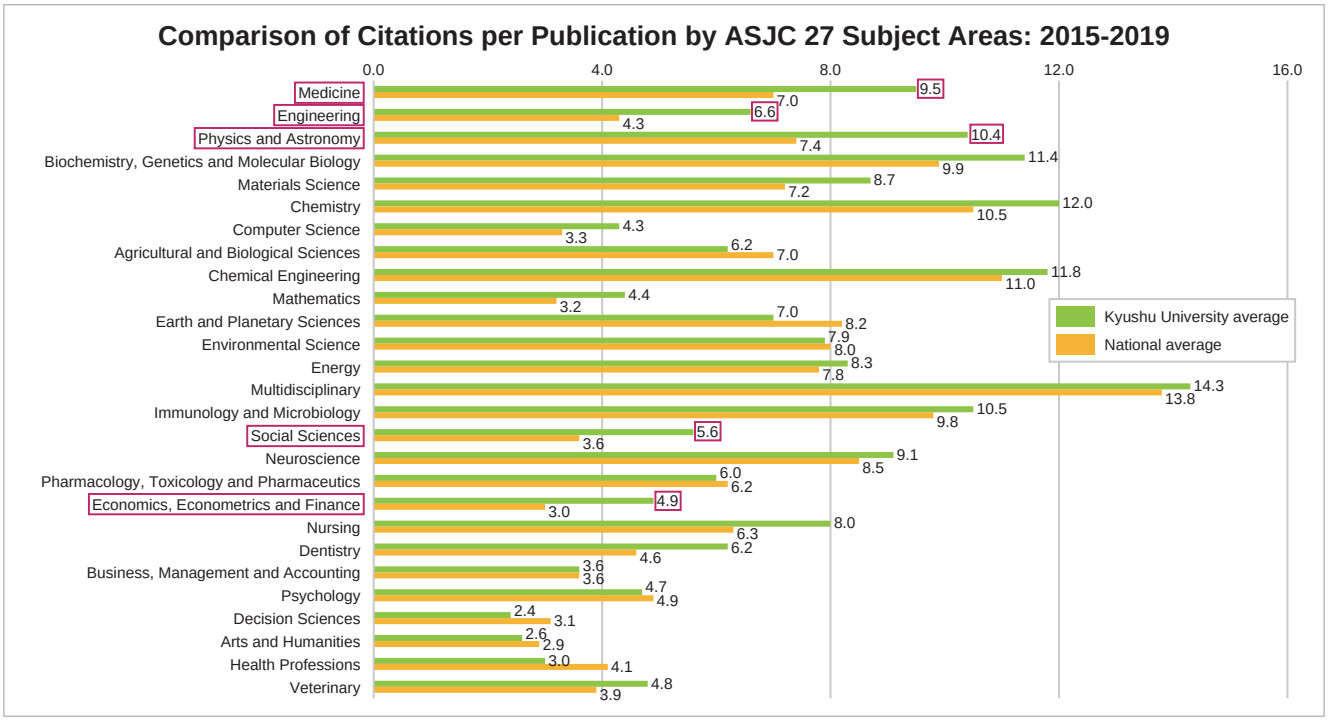
■ Comparison between Kyushu University and the National Average by ASJC 27 Subject Areas: Citations per Publication

In 18 out of 27 fields, Kyushu University's citations per publication are higher than the national average. Among these, the 5 fields with the most citations are: Physics and Astronomy, Medicine, Social Sciences, Engineering, and Economics, Econometrics and Finance.

◆ Kyushu University◆



◆Comparison between Kyushu University and the National Averages ◆



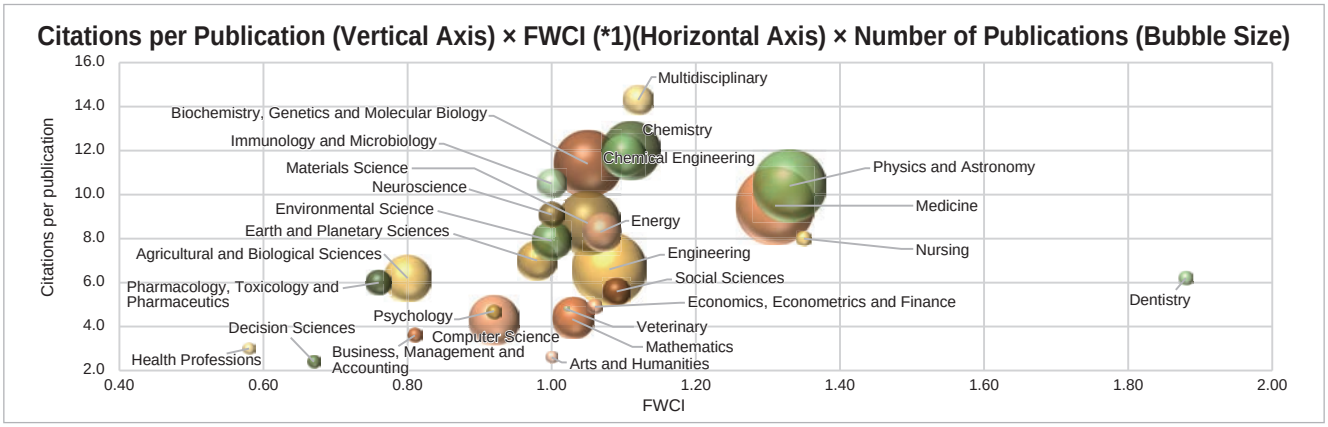
(*1) The above journal categories are based on the ASJC 27 (ASJC: All Scopus Science Journal Classification) in Scopus.

*Source: Elsevier's "SciVal" (as of September 2020)

9-2. Comparisons of Publication Quantity and Quality (Continued)

■ Comparison of Research Fields of Kyushu University Publications by ASJC 27 Subject Areas: 2015-2019

The further right the field is positioned, the higher the FWCI (*1) and the higher it is positioned, the greater the number of citations per publication. Both are indicators of quality publications, especially in the following fields: Dentistry, Nursing, Physics and Astronomy, Medicine, and Multidisciplinary. (Multidisciplinary field is one in which publications are carried in general scientific magazines such as Nature and Science.)



■ Comparison of Research Fields of Kyushu University Publications by ASJC 334 Fields: 2015-2019

In 133 of the 334 fields that are measured by FWCI, Kyushu University ranks above the global average of 1.0. Among these, the top 10 fields with Kyushu University's highest FWCI rankings are listed below. It is possible that fields with a high FWCI and fewer publications have faculty with excellent research skills. In fields with a high FWCI and many publications, advanced research capabilities (one of the strengths of a university) are indicated.

Rank	ASJC 27 Subject Areas（*2）	ASJC 334 Fields（*2）	FWCI	Number of Publications
1	Nursing	Psychiatric Mental Health	15.36	5
2	Medicine	General Medicine	4.76	318
3	Engineering	Engineering (miscellaneous) (*3)	3.63	229
4	Physics and Astronomy	Physics and Astronomy (miscellaneous) (*4)	3.17	422
5	Business, Management and Accounting	Business and International Management	2.83	20
6	Dentistry	General Dentistry	2.51	118
7	Veterinary	Equine	2.46	1
7	Veterinary	Small Animals	2.46	1
9	Nursing	Advanced and Specialized Nursing	2.31	19
10	Health Professions	Occupational Therapy	2.29	1

(*1) FWCI (Field-Weighted Citation Impact) is the number of citations received by the publication, divided by the world average for the same type of publications in the same field and same publication year. An FWCI of 1 or higher means that the average impact is higher than the world average.

(*2) The 27 major and 334 minor fields is based on the Scopus ASJC categorization (ASJC: All Scopus Science Journal Classification).
Translation assistance: NIAD-QE, the National Institution for Academic Degrees and Quality Enhancement of Higher Education (the major field categories are Elsevier translations)

(*3) Engineering (miscellaneous) refers to topics besides the following: Aerospace Engineering; Automotive Engineering; Biomedical Engineering; Civil and Structural Engineering; Computational Mechanics; Control and Systems Engineering; Electrical and Electronic Engineering; Industrial and Manufacturing Engineering; Mechanical Engineering; Mechanics of Materials; Ocean Engineering; Safety, Risk, Reliability, and Quality; Media Technology; Building and Construction; Architecture.

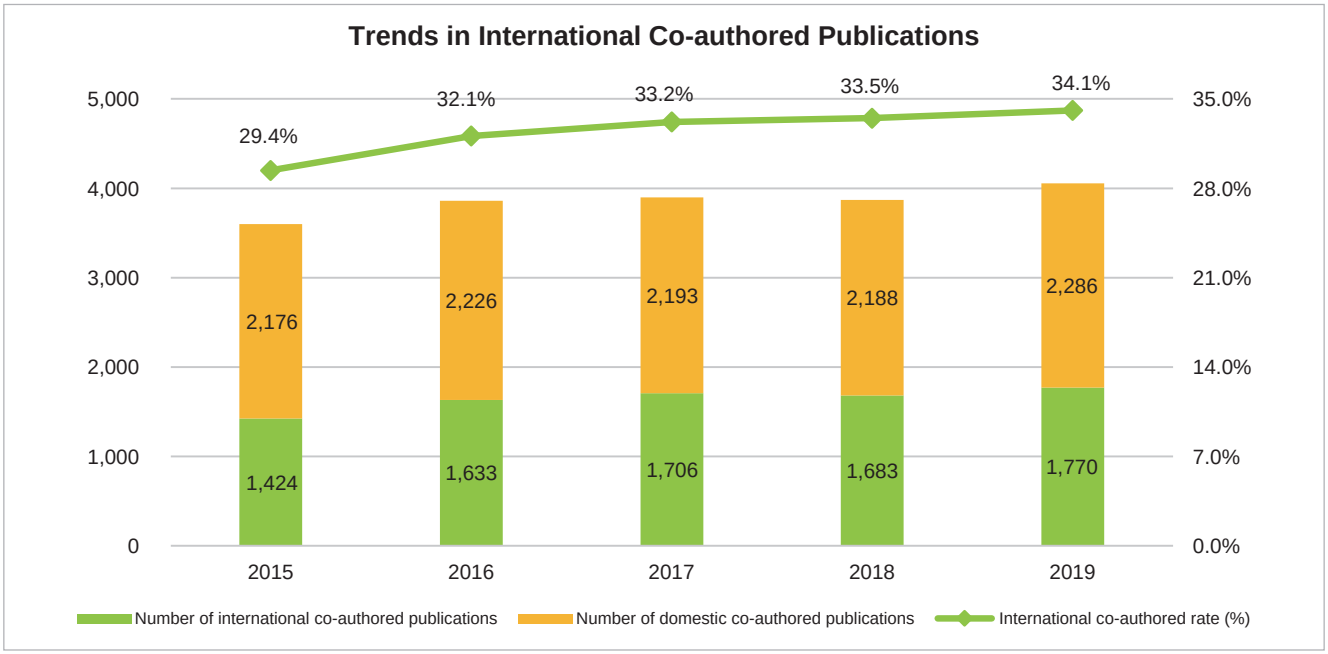
(*4) Physics and Astronomy (miscellaneous) refers to topics besides the following: Acoustics and Ultrasonics; Astronomy and Astrophysics; Condensed Matter Physics; Instrumentation; Nuclear and High Energy Physics; Atomic and Molecular Physics or Optics; Radiation; Statistical and Nonlinear Physics; Surfaces and Interfaces.

*Source: Elsevier's "SciVal" (as of September 2020)

9-3. International Co-authored Publications

Looking at Kyushu University's international co-authorship, both the number of papers and co-authorship rate are increasing. From 2010 to 2019, the number of internationally co-authored papers more than doubled, and the international co-authorship rate rose from 21.0% to 34.1% in the same period. This is the greatest rate of growth among RU11 (*1) universities.

◆ Kyushu University ◆



◆ By Faculty ◆ (2015-2019)

Rank	Faculty	Number of International Co-authored Publications (Total)	International Co-authorship Average Rate (%)
1	Faculty of Engineering	1,311	29.1
2	Faculty of Science	1,241	55.7
3	Faculty of Agriculture	728	39.7
4	Faculty of Information Science and Electrical Engineering	696	30.4
5	Faculty of Medical Sciences	615	12.8
6	Faculty of Engineering Sciences	430	37.2
7	Faculty of Pharmaceutical Sciences	157	24.5
8	Faculty of Dental Science	149	20.9
9	Faculty of Social and Cultural Studies	86	43.9
10	Faculty of Design	76	19.5
11	Faculty of Human- Environment Studies	56	32.4
12	Faculty of Economics	55	37.4
13	Faculty of Mathematics	36	19.4
14	Faculty of Law	21	53.9
15	Faculty of Languages and Cultures	3	7.5
16	Faculty of Humanities	0	0.0

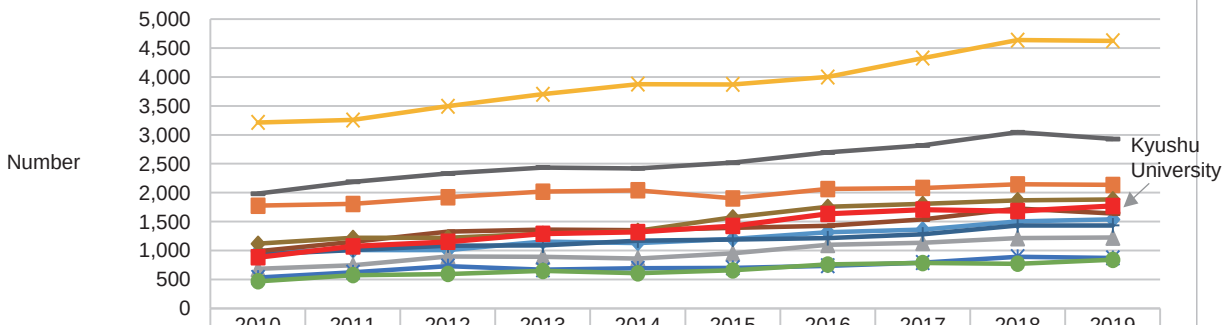
(*1) RU11 (Research University 11) is a consortium that aims to develop academia via eleven universities: Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University, and Kyushu University. RU11 is composed of both national and private universities.

*Source: Elsevier's "SciVal" (as of September 2020)

9-3. International Co-authored Publications (Continued)

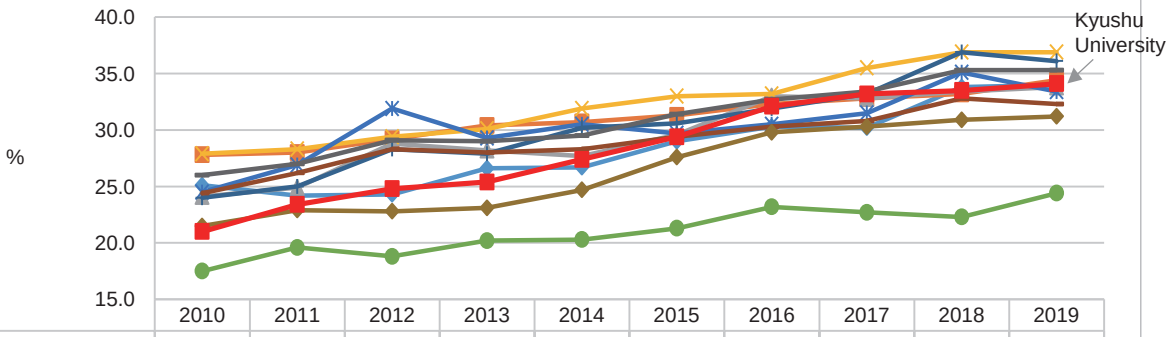
◆Comparison of the RU11◆ (2010-2019)

Number of International Co-authored Publications



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hokkaido University	981	1,006	1,008	1,156	1,131	1,202	1,319	1,364	1,505	1,539
Tohoku University	1,776	1,806	1,923	2,017	2,042	1,903	2,064	2,082	2,145	2,135
University of Tsukuba	683	745	898	892	863	952	1,097	1,133	1,214	1,225
The University of Tokyo	3,214	3,257	3,495	3,702	3,876	3,870	3,999	4,326	4,636	4,625
Waseda University	534	626	731	669	694	700	736	792	892	874
Keio University	468	575	595	648	607	657	759	784	773	841
Tokyo Institute of Technology	931	1,010	1,085	1,088	1,171	1,190	1,215	1,280	1,434	1,434
Nagoya University	988	1,148	1,326	1,362	1,350	1,390	1,428	1,537	1,724	1,639
Kyoto University	1,983	2,188	2,332	2,434	2,419	2,519	2,696	2,818	3,044	2,929
Osaka University	1,119	1,219	1,223	1,290	1,341	1,572	1,754	1,805	1,870	1,885
Kyushu University	884	1,073	1,151	1,291	1,321	1,424	1,633	1,706	1,683	1,770

International Co-authorship Rate



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Hokkaido University	25.1	24.2	24.3	26.6	26.7	29.0	30.3	30.2	33.8	34.0
Tohoku University	27.8	28.0	29.2	30.4	30.7	31.3	32.3	32.8	33.2	34.4
University of Tsukuba	24.1	24.9	28.8	28.2	27.7	29.6	33.0	32.8	33.4	33.8
The University of Tokyo	27.9	28.3	29.4	30.1	31.9	33.0	33.2	35.5	36.9	36.9
Waseda University	24.5	26.9	31.9	29.3	30.5	29.7	30.5	31.5	35.1	33.4
Keio University	17.5	19.6	18.8	20.2	20.3	21.3	23.2	22.7	22.3	24.4
Tokyo Institute of Technology	24.0	25.0	28.3	27.9	30.2	30.6	31.9	33.2	36.9	36.1
Nagoya University	24.4	26.2	28.3	28.0	28.3	29.4	30.3	30.8	32.8	32.3
Kyoto University	26.0	27.0	29.1	29.0	29.5	31.4	32.7	33.4	35.3	35.3
Osaka University	21.5	22.9	22.8	23.1	24.7	27.6	29.8	30.3	30.9	31.2
Kyushu University	21.0	23.4	24.8	25.4	27.4	29.4	32.1	33.2	33.5	34.1

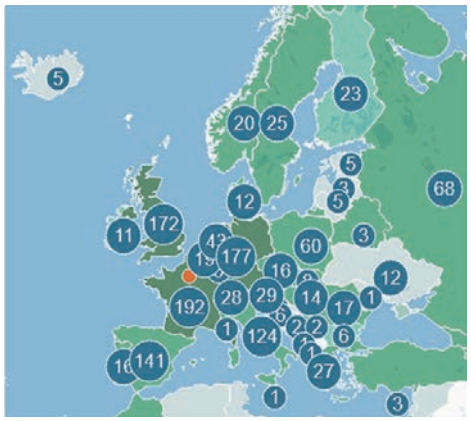
・RU11 (Research University 11) is a consortium that aims to develop academia via eleven universities: Hokkaido University, Tohoku University, University of Tsukuba, The University of Tokyo, Waseda University, Keio University, Tokyo Institute of Technology, Nagoya University, Kyoto University, Osaka University, and Kyushu University. RU11 is composed of both national and private universities.

*Source: Elsevier's "SciVal" (as of September 2020)

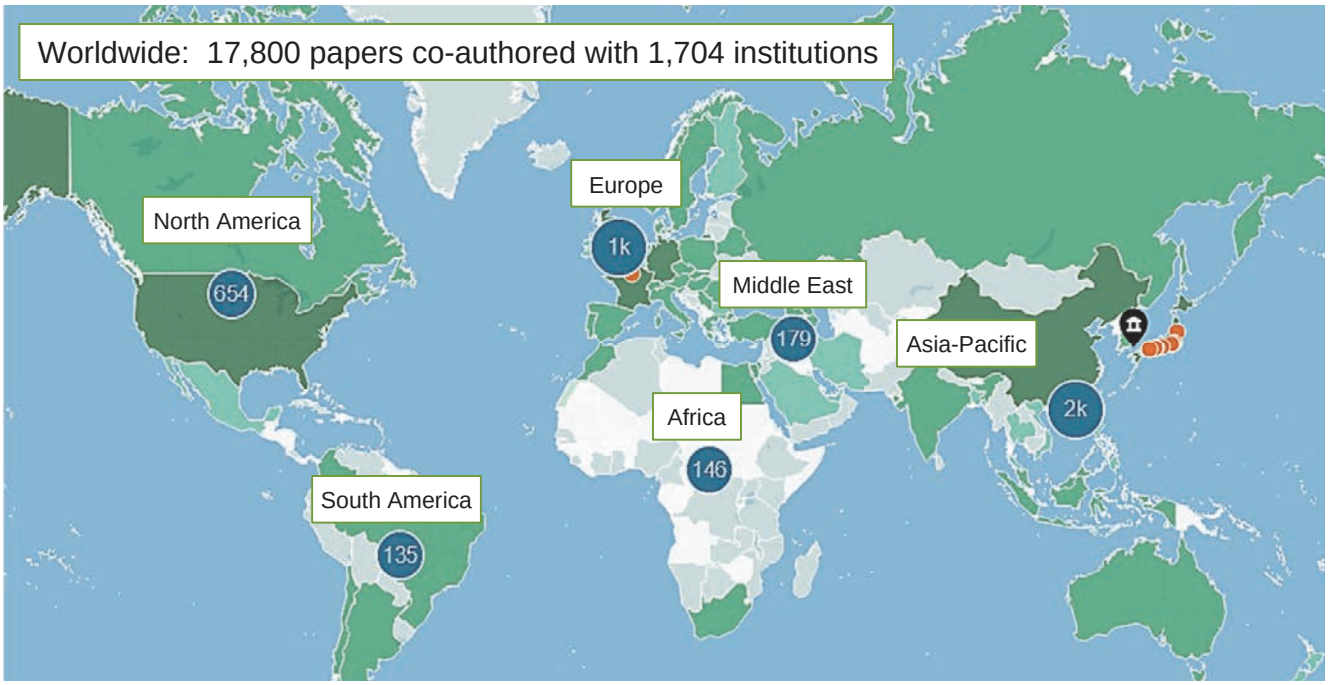
International Co-authorship with Institutions Worldwide: 2015-2019

North America
2,832 papers co-authored with 654 institutions

Europe
2,832 papers co-authored with 1,311 institutions



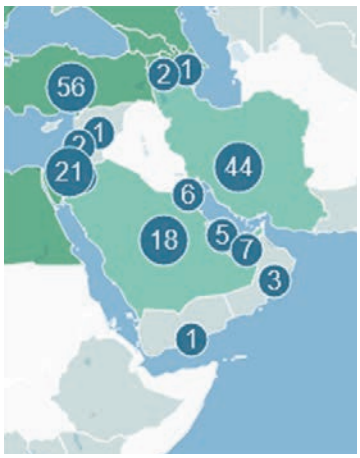
Asia-Pacific
2,810 papers co-authored with 654 institutions



South America
695 papers co-authored with 135 institutions

Africa
1,148 papers co-authored with 146 institutions

Middle East
872 papers co-authored with 179 institutions



・Figures on the maps represent the number of institutions.
・Details at https://www3.ir.kyushu-u.ac.jp/en/global-engagements

*Source: Elsevier's "SciVal" (as of September 2020)