

Online Data Supplement

A Bibliometric Analysis of coronary microcirculation over a 30-Year Period

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Funding Information

This study was financially supported by grants from the Beijing Municipal Natural Science Foundation (No. 7212068) and the National Natural Science Foundation of China (No. 81900747).

Conflicts of Interest: The authors declare no conflict of interest.

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Supplementary Table 1. Top 10 countries/regions with the largest number of articles or the largest cooperation intensity. The top 10 countries/regions with the largest number of articles were the USA, Italy, Germany, England, Japan, China, Netherlands, Australia, Canada, and France. The number of articles, the citations, the sum of times cited, and the H-index value were retrieved from the WoSCC database. The H-index is used to evaluate the academic impact of a country/region or an author who published H papers, each of which was cited at least H times. The rank of co-authorship country/region and the total link strength were identified by VOSviewer 1.6.18 (www.vosviewer.com) software. Total link strength indicates the total strength of the co-authorship links of a country/region with other countries/regions. WoSCC = Web of Science Core Collection. H-index = Hirsch index.

Supplementary Table 2. Top 10 institutions with the largest number of articles or the largest cooperation intensity. The number of articles and citations per article with the top 10 institutions were retrieved from the WoSCC database. The rank of the co-authorship institution and the total link strength were identified by VOSviewer software. Total link strength indicates the total strength of the co-authorship links of an institution with other institutions. The top 10 co-authorship institutions were located in the USA, Australia, Singapore, and England. WoSCC = Web of Science Core Collection.

Supplementary Table 3. Top 10 productive journals and co-cited journals. The number of articles, the sum of times cited, and the H-index value with the top 10 productive journals were retrieved

from the WoSCC database. The IF was extracted from JCR 2020. H-index = Hirsch index. WoSCC = Web of Science Core Collection. IF = impact factor. JCR = Journal Citation Reports.

Supplementary Table 4. Top 10 authors and co-cited authors. The number of articles with the top 10 authors was retrieved from the WoSCC database. The rank of co-authorship author and the total link strength were identified by VOSviewer software. Total link strength indicates the total strength of the co-authorship links of an author with other authors. WoSCC = Web of Science Core Collection.

Supplementary Figure 1. The alluvial flow map of co-cited references. Alluvial flow map was generated based on the data from CiteSpace as Pathfinder networks (batch export to Pajek.net files) of co-cited references from 2017 to 2021. Each colored and continuous line flow referred to an article that had been consistently cited in the past 5 years.

Supplementary Figure 2. Flow diagram of search and selective strategy. The references ($n = 14540$) were retrieved from the WoSCC database from January 1, 1990, to January 1, 2022. A total of 11,718 publications met the retrieval standard and the excluded studies included non-English, meeting abstracts, editorial materials, letters, early accesses, corrections, proceeding papers, book chapters, retracted publications, data papers, and retractions. The data was sent to the Vosviewer and CiteSpace software to visualize and analyze.

Supplementary File 1. The total number and classification of publications. Sheet 1 was the total number and proportion of publications from January 1, 1990, to January 1, 2022 ($n = 11718$) in the field of coronary microcirculation. Sheet 2 to 4 was the total number and proportion of publications in different countries/regions, institutions, and authors respectively.

Supplementary File 2. The key 19 clusters of co-cited references. Sheet 1 was the total number of key 19 clusters of co-cited references including 2,508 articles through clustering analysis by CiteSpace software. The items include co-cited frequency, burst strength, degree, author, year, source, volume, page, citation half-life, doi, and cluster ID. Sheet 2 was the main information of 19 clusters through the LLR algorithm. Every cluster contained the size, silhouette score, year, and label content. The silhouette score was employed to define the separation distance and homogeneity between the clusters from the lowest -1 to the highest 1. ID = identity. LLR = Log-likelihood ratio.

Supplementary File 3. The co-citation countries, institutions, and authors. The dataset was downloaded from VOSviewer software. Sheet 1 was the co-citation countries and the total link strength of a country with other countries. Sheet 2 to 3 was the number of articles, co-citations, and total link strength in different institutions and authors respectively.

Supplementary Table 1. Top 10 countries/regions with the largest number of articles or the largest cooperation intensity

Rank	Country/region	Articles (N)	H- index	Citations per article	Sum of times cited	Rank	Co-authorship country/region	Total link strength
1	USA	4,141	196	50.6	209528	1	USA	2355
2	Italy	1,190	106	39.7	47241	2	England	1254
3	Germany	1,110	110	44.29	49161	3	Germany	1056
4	England	1,064	106	62.58	66588	4	Italy	1040
5	Japan	927	79	35.09	32531	5	Netherlands	988
6	China	766	46	14.91	11418	6	Australia	734
7	Netherlands	695	84	44.38	30845	7	France	603
8	Australia	522	78	59.17	30887	8	Canada	577
9	Canada	475	65	40.9	19426	9	Spain	543
10	France	396	65	43.3	17148	10	Japan	410

Supplementary Table 2. Top 10 institutions with the largest number of articles or the largest cooperation intensity

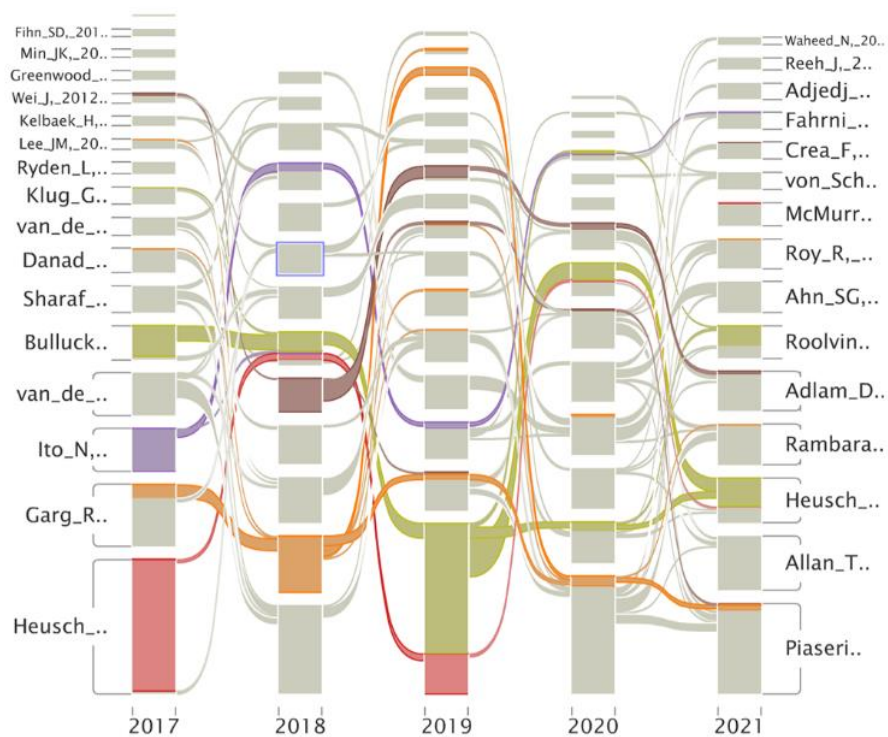
Rank	Institution	Articles (N)	Citations per article	Rank	Co-authorship institution	Total link strength	Location
1	Harvard University	485	67.03	1	Harvard University	459	USA
2	University of California System	324	51.02	2	University of Melbourne	449	Australia
3	University of London	301	80.54	3	National University Singapore	446	Singapore
4	Mayo Clinic	273	47.56	4	Emory University	444	USA
5	Imperial College London	272	86.25	5	University of Florida	423	USA
6	US Department of Veterans Affairs	223	61.1	6	Cedars-Sinai Medical Center	397	USA
7	Veterans Health Administration VHA	221	61.42	7	Mayo Clinic	390	USA
8	University of Amsterdam	208	38.5	8	Brigham Women S Hospital	379	USA
9	National Institutes Health NIH USA	201	88.76	9	University of Glasgow	344	England
10	Brigham Women S Hospital	201	68.23	10	University of Pittsburgh	327	USA

Supplementary Table 3. Top 10 productive journals and co-cited journals

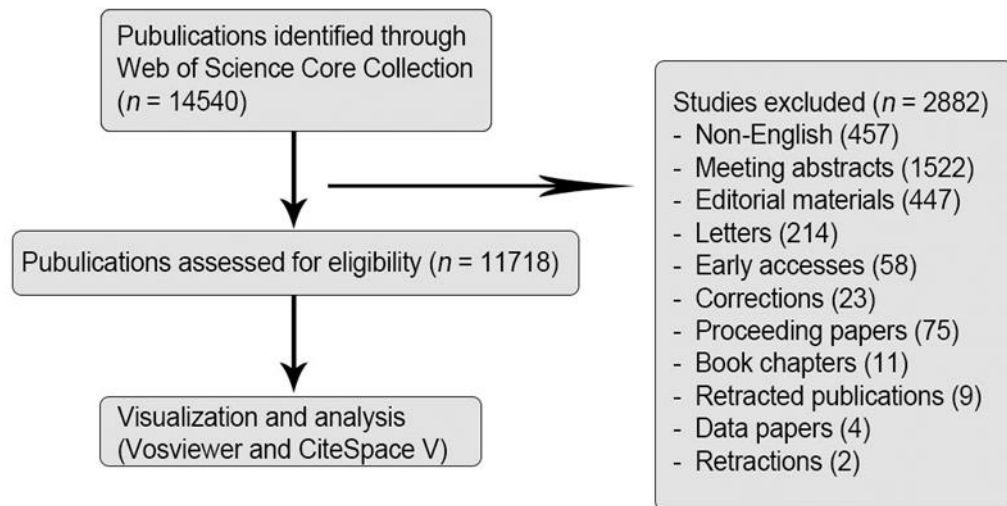
Rank	Journal	Articles (N)	IF (2020)	H- index	JCR	Rank	Co-cited Journal	Sum of times cited	IF (2020)	H- index	JCR
1	Circulation	381	29.69	129	Q1	1	Circulation	55427	29.69	129	Q1
2	American Journal of Physiology Heart and Circulatory Physiology	322	4.733	64	Q2	2	Journal of the American College of Cardiology	32745	24.093	106	Q1
3	Journal of the American College of Cardiology	296	24.093	106	Q1	3	New England Journal of Medicine	16939	91.253	20	Q1
4	American Journal of Cardiology	255	2.778	44	Q3	4	American Journal of Cardiology	14333	2.778	44	Q3
5	International Journal of Cardiology	242	4.164	34	Q2	5	European Heart Journal	13363	29.983	69	Q1
6	European Heart Journal	197	29.983	69	Q1	6	Circulation Research	13323	17.367	60	Q1
7	Cardiovascular Research	137	10.787	44	Q1	7	Lancet	9111	79.323	16	Q1
8	American Heart Journal	129	4.749	41	Q2	8	Diabetes Care	8778	19.112	44	Q1
9	Catheterization and Cardiovascular Interventions	121	2.692	25	Q3	9	American Journal of Physiology Heart and Circulatory Physiology	8584	4.733	64	Q2
10	PLoS ONE	118	3.24	26	Q2	10	American Journal of Physiology	7401	3.077	28	Q1

Supplementary Table 4. Top 10 authors and co-cited authors

Rank	Author	Articles (N)	Rank	Co-authorship author	Total link strength
1	Crea F	146	1	Crea F	589
2	Lerman A	120	2	Berry C	575
3	Wong TY	117	3	Merz CNB	560
4	Sellke FW	116	4	Oldroyd KG	455
5	Merz CNB	108	5	Piek JJ	448
6	Camici PG	88	6	Pepine CJ	447
7	Pepine CJ	85	7	Escaned J	431
8	Piek JJ	84	8	Mcentegart M	407
9	Lerman LO	77	9	Thiele H	404
10	Kaski JC	74	10	Eitel I	393



Supplementary Figure 1. The alluvial flow map of co-cited references. Alluvial flow map was generated based on the data from CiteSpace as Pathfinder networks (batch export to Pajek.net files) of co-cited references from 2017 to 2021. Each colored and continuous line flow referred to an article that had been consistently cited in the past 5 years.



Supplementary Figure 2. Flow diagram of study search and selection. The references were retrieved (n = 14540) from the WoSCC database from January 1, 1990, to January 1, 2022. A total of 11,718 publications met the retrieval standard and the excluded studies included non-English, meeting abstracts, editorial materials, letters, early accesses, corrections, proceeding papers, book chapters, retracted publications, data papers, and retractions. The data was sent to the Vosviewer and CiteSpace software to visualize and analyze.