The Scientometrics analysis on the research landscape of Epigenetics in Diabetes research

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Abstract:

In recent years, there has been a surge of interest in the field of epigenetics and its potential implications for understanding and treating diseases, including diabetes. Epigenetics is the study of how people's behaviours and environment can impact the way their genes function. It plays an important role in the development and progression of diabetes. This study aims to find the year-wise distribution of papers published on epigenetics in diabetes and to find the most productive authors, top funding agencies, countries, and journals contributing to the research relating to epigenetics in diabetes. The study found that a lot of research was published in the form of articles and that the number of papers being published on Epigenetics in Diabetes has been increasing year after year. The highest number of records published was in the year 2021 with 365 records. The study also found that the USA was a highly productive country and India stands at 10th position in terms of research publication outcome.

Keywords: *Epigenetics, Diabetes, Scientometrics, Bibliometrics, Medical science*

Introduction

In recent years, there has been a surge of interest in the field of epigenetics and its potential implications for understanding and treating diseases, including diabetes. Epigenetics refers to changes in gene expression that occur without altering the underlying DNA sequence. By studying these epigenetic modifications, researchers hope to gain insights into the molecular mechanisms that contribute to the

development and progression of diseases like diabetes. In this article, we will explore the research landscape of epigenetics in diabetes research and uncover the latest advancements in this fascinating field.A scientometric analysis of epigenetics in diabetes research has the ability to provide valuable insights into the intricate relationship between gene expression and disease pathogenesis. By mapping the scientific landscape and identifying hotspots and knowledge gaps, scientists can focus their efforts on groundbreaking research avenues. As epigenetics continues to unravel the complexities of diabetes, we stand poised to unlock new diagnostic tools, therapeutic strategies, and ultimately, the prevention and cure of this global health burden.

Objectives

The main objectives of this study are:

- To show the year-wise distribution of research growth between the years (1993 – 2023).
- To investigate the distribution of research findings in the chosen field by journals.
- To discover the most productive authors.
- To determine the distribution of publications by institutional grouping.
- To discover the top countries and funding agencies that contributed to the chosen topic.

Materials and Methods

The researcher has explored the premier indexing database Web of Science as a source for data accumulation of the research indexed on epigenetics, with special emphasis on diabetes. The researcher used the keyword “Epigenetic in diabetes” as a phrase search and the records found from the year 1993 have been retrieved and organized into Histcite. VOSVieweris the analytical tools used for mapping the research outcome. The study aimed at analysing the citation and impact of the research outcome, the funding pattern, the source publication, the growth pattern and collaborative pattern.

Analysis and Interpretation

Table1: Year wise Distribution

S.No	Publication Year	Recs	TLCS	TGCS	S.No	Publication Year	Recs	TLCS	TGCS
1	1993	1	2	264	16	2009	53	522	5805
2	1994	1	15	227	17	2010	77	938	12458
3	1996	1	0	242	18	2011	98	991	8894
4	1997	2	3	155	19	2012	136	1029	9661
5	1998	1	0	94	20	2013	177	951	20701
6	1999	4	0	242	21	2014	183	1077	11924
7	2000	2	1	14	22	2015	239	1221	17397
8	2001	4	18	129	23	2016	214	772	11407
9	2002	6	34	378	24	2017	287	724	16409
10	2003	2	9	194	25	2018	268	722	10047
11	2004	8	16	832	26	2019	322	559	12242

12	2005	22	113	3503	27	2020	319	240	9646
13	2006	24	83	2642	28	2021	365	128	5069
14	2007	45	302	3395	29	2022	347	53	1551
15	2008	50	737	6931	30	2023	225	0	188

The above table shows the year-wise distribution of papers published on Epigenetics in Diabetes from the year 1993 to 2023.The highest number of records published was in the year 2021 with 365 records which have 128 TLCS and 5069 TGCS, followed by the year 2022 with 347 records which have 52 TLCS and 1551 TGCS, the year 2019 with 322 records having 559 TLCS and 12242 TGCS, the year 2020 with 319 records published which have 240 TLCS and 9646 TGCS, and so on. The years 1993, 1994,1996, and 1998 had the least number of publications having 1 publication each respectively. From the table, it can be inferred that the number of papers being published on Epigenetics in Diabetes has been increasing year after year.

The various document types in which the research related to Epigenetics in Diabetes. A lot of research is published in the form of 1863 articles followed by 1392 reviews, 70 meeting abstracts, 61 proceeding papers, 36 editorial materials, and so on.

Table 2: Prolific Journal wise Distribution

S.No	Journal	Recs	TLCS	TGCS
1	International Journal Of Molecular Sciences	103	22	2924
2	Frontiers In Endocrinology	84	0	1519
3	Clinical Epigenetics	78	0	2520
4	Diabetes	76	1448	5589
5	Diabetologia	61	802	3545
6	PLOS One	57	0	2186
7	Nutrients	45	45	2346
8	Scientific Reports	45	0	1232

9	Epigenetics	39	355	1720
10	Epigenomics	39	Social factors of suicides in Sri Lanka	796

The above table shows the top 10 prolific journal-wise distribution of articles. The International Journal of Molecular Sciences has the highest number of publications with 103 articles published, followed by Frontiers in Endocrinology with 84 articles, Clinical Epigenetics with 78 articles, Diabetes with 76 articles, and so on.

Table 3: Prolific Author wise Distribution

S.No	Author	Recs	TLCS	TGCS	S.No	Author	Recs	TLCS	TGCS
1	Ling C	61	1283	5943	11	Beguinot F	20	52	324
2	Nataraja n R	41	962	3152	12	Saffery R	20	54	823
3	Kowlur u RA	35	496	2057	13	Chakrabar ti S	19	103	938
4	El-Osta A	27	459	2466	14	Hivert MF	19	280	971
5	Vaag A	27	480	1964	15	Perfilyev A	19	300	1071
6	Ronn T	26	715	3291	16	Volkov P	19	337	2265
7	Groop L	24	552	2624	17	Paneni F	18	136	1193
8	Ozanne SE	24	155	1917	18	Simmons RA	18	374	1428
9	Nilsson E	21	472	2517	19	Cosentino F	17	128	1286
10	Zhang Y	21	75	487	20	Costantin o S	17	116	498

The table shows the top 20 list of prolific authors who have contributed articles on Epigenetics in Diabetes. Author Ling C is on the top of the list with 61 articles with a total of 1283 TLCS and 5943 TGCS followed by Natrajan R with 41 articles with a total of 962 TLCS and 3152 TGCS,

Kowluru RA with 35 articles with a total of 496 TLCS and 2057 TGCS, El-Osta A with 27 articles with a total of 459 TLCS and 2466 TGCS, Vaag A with 27 articles with a total of 480 TLCS and 1964 TGCS and so on.

Table 4: Country wise Distribution

S.No	Country	Recs	TLCS	TGCS
1	USA	1138	5411	68592
2	Peoples R China	527	980	14532
3	UK	339	1486	35290
4	Italy	279	940	15021
5	Germany	208	493	16942
6	Australia	203	1035	16421
7	Sweden	184	1791	12083
8	Canada	172	946	9793
9	Spain	160	349	17722
10	India	153	245	5026

The above table shows the list of the top 10 countries that contributed to Epigenetics in Diabetes. USA is on top of the list with 1138 articles published with a total of 5411 TLCS and 68592 TGCS. The USA is followed by the People's Republic of China in the 2nd place with 527 articles with a total of 980 TLCS and 14532 TGCS followed by the UK, Italy, and Germany in the 3rd, 4th, and 5th positions respectively. India is in 10th position on the list with 153 articles published with a total of 245 TLCS and 5026 TGCS.

Table 5: Institution wise Distribution

S.No	Institution	Recs	TLCS	TGCS
1	Lund University	86	1202	6629
2	University of Copenhagen	67	493	4504
3	University of Penn	65	730	5130
4	University of Melbourne	61	297	2387
5	Karolinska Institute	54	398	3572
6	Harvard Med School	53	112	3007
7	University of Cambridge	52	427	5561
8	Monash University	49	246	1745
9	University Michigan	47	120	2251
10	University Southampton	45	397	5647

The above table shows the top 10 list of institutions that contributed to Epigenetics in Diabetes. Among the top 10 institutions, Lund University is at the top of the list with 86 articles with a total of 1202 TLCS and 6629 TGCS followed by the University of Copenhagen with 67 articles with a total of 493 TLCS and 4504 TGCS, the University of Pennsylvania with 65 articles with a total of 730 TLCS and 5130 TGCS, University of Melbourne with 61 articles with a total of 297 TLCS and 2387 TGCS and so on.

Table 6: Keyword analysis

S.No	Word	Recs	TLCS	TGCS	S.No	Word	Recs	TLCS	TGCS
1	Diabetes	978	4283	42317	11	Obesity	234	794	12748
2	Epigenetic	823	4353	33675	12	Human	229	1177	14459
3	Type	499	2879	25721	13	Mellitus	222	728	9882
4	Methylation	434	2706	18478	14	Associated	219	1122	8496

5	Dna	368	2187	15038	15	Regulation	208	773	8631
6	Diabetic	366	2222	18466	16	Maternal	199	780	8594
7	Disease	341	710	20014	17	Expression	193	1146	9501
8	Metabolic	292	1427	16028	18	Gene	193	1228	9665
9	Role	251	736	9892	19	Cell	185	454	6191
10	Cells	235	557	6268	20	Epigenetics	182	981	9722

The above tablelists the top 20 words that have been frequently used. The word diabetes has been used 978 times followed by the word epigenetic 823 times, the word type 499 times, Methylation 434 times, DNA 368 times, and so on.

Table 7: Funding Agencies (3797)

S.no	Funding Agencies	Record Count	%
1	United States Department of Health Human Services	672	19.43
2	National Institutes of Health NIH USA	670	19.37
3	National Natural Science Foundation of China NSFC	321	9.28
4	European Union EU	132	3.82
5	NIH National Institute of Diabetes Digestive Kidney Diseases Niddk	131	3.79
6	Uk Research Innovation UKRI	128	3.70
7	Medical Research Council UK MRC	115	3.33
8	Novo Nordisk Foundation	107	3.09
9	Juvenile Diabetes Research Foundation	100	2.89
10	Spanish Government	93	2.69

The above table shows the top 10 list of funding agencies that funded the research on Epigenetics in Diabetes. Out of the top 10 funding agencies, the United States Department of Health and Human Services

funded a total of 672 articles placing it in 1st place followed by the National Institutes Of Health, USA funded 670 articles, the National Natural Science Foundation Of China Nsfc funded 321 articles, European Union Eu 132 articles, Nih National Institute Of Diabetes Digestive Kidney Diseases Niddk with 131 articles and so on.

Results and Discussion

A lot of research is published in the form of an article with 1863 articles followed by 1392 reviews, 70 meeting abstracts, 61 proceeding papers, 36 editorial materials, and so on. It can be inferred that the number of papers being published on Epigenetics in Diabetes has been increasing year after year.The highest number of records published was in the year 2021 with 365 records which have 128 TLCS and 5069 TGCS, followed by the year 2022 with 347 records which have 52 TLCS and 1551 TGCS. Itwas found that the present research outcome on epigenetics does not adhere to Bradford's law of proliferation of research in journals as the top 20 journals could contribute less research outcome during the study period. The USA is a highly productive country and India stands at 10th position in terms of research publication outcome.

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