SCIENTOMETRIC SKETCH AND ACADEMIC VISIBILITY OF NOBEL LAUREATE SVANTE PÄÄBO

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Abstract

The swedish scientist Svante Pääbo received his noble prize in Physiology or Medicine in the year 2022, due to his work for the modern human evolution and the neandertal genome. The study attempted to ascertain and assess the academic visibility of nobel laureate Prof. Svante Pääbo from 1974 to 2023. The data was retrieved from the Google Scholar database. The study makes use of a number of scientometric parameters to identify Prof. Svante Pääbo's most prolific sources, most referenced works, authorship patterns, and top publications. Afterwards, the gathered data was processed and examined using a variety of programmes, including Microsoft Excel, VosViewer, and Publish or Perish. The study found that during 1974-2023, Prof Pääbo had the most citations (12304) in the year of 2015. He contributed the most publications (49) in Nature. The research shows that he collaborated closely with Krause J, Green Re, Kelso J, Prufer, K . His article named "A global reference for human genetic variation" received the most citations. The collaboration rate was 0. 86. It was also observed that the most number of publications belongs to the group of seven authorship (26. 48%).

Keywords: Scientometric, academic visibility, citation metrics

1. Introduction

Svante Pääbo, a Swedish geneticist born in 1955 at Stockholm. He was the first to decode the Neanderthal DNA and identify the hominid Denisova. He received the Nobel Prize in Physiology or Medicine in 2022 for his revolutionary work on hominin DNA and human evolution. Pääbo pursed his phd from Uppsala university and postdoc from University of Zürich and University of California. His most significant discoveries occurred after he used DNA extraction and sequencing to investigate the connection between modern and ancient people. He used mitochondrial DNA (mtDNA) to sequence a piece of the Neanderthal genome, indicating that humans and Neanderthals are separate species that swerved by one another 500,000 years ago. Pääbo went on to sequence the full Neanderthal genome, finding up to 4% overlap with the genomes of persons of European and Asian descent. Additionally, Pääbo analysed the mitochondrial DNA from a 40,000-year-old finger bone found in the Denisova Cave in Russia, proving the existence of the Denisovans, a previously unidentified hominid species that coexisted with humans and Neanderthals. All three species interbred, and as a result, up to 6% of the DNA of contemporary Southeast Asian and Melanesian peoples can be attributed to the Denisovans. (The Nobel prize in physiology or medicine 2022). In today's digital and social media age, online visibility is crucial. By Using academic websites like LinkedIn, ResearchGate, Academia. edu and Google Scholar, it is possible to establish connections with audiences far outside of the traditional academic borders. An essential step on the road to academic visibility is collaboration.

They offer a diverse approach and additional knowledge.

Notable collaborators can also help us become more visible in our respective field (Mauvais-Jarvis, 2016). A quick and easy tool to conduct a thorough search for academic literature is Google Scholar. We can Search across a variety of subjects and sources from a single platform, including academic publishers, professional associations, online repositories, institutions, and other websites. This includes articles, theses, books and abstracts. Google Scholar assists us in locating pertinent research throughout the intellectual community (About google scholar).

2. Objectives

- To figure out the top metrics for publications according to GS rank
- To find out the total number of publications with citations
- To recognise the authorship patterns
- To know the author collaboration networks
- To identify the most widely cited sources
- To point out the most often used keywords by prof Pääbo

3. Research Problem

No study was found to showcase the academic visibility of nobel laureate Prof. Svante Pääbo.

4. Review of related literature

(Sinha, 2017) has examined the Amartya Sen's scientometric profile. According to the study, he published 43 books between 1960 to 2015,. The most notable contributor of Dr. Sen was Jean Dreze. The study also revealed that he is well known for his work on social issues, politics, government, and financial economics in addition to his contributions to the field of education.

(Bhattacharyya & Bhattacharyya Sahu, 2020) describes the informetric potrait of Elinor Ostrom, who became the first female laureate to win the Nobel Prize in Economics, The study identified that she wrote 197 publications between 1965 to 2018. The study is based on scopus data. Her work, which appeared in 116 journals was on the management of natural resources. Her bibliometric study sheds light on both the significance of her significant work and its potential future significance.

(Bhui & Bhattacharyya Sahu, 2017) studied the scientometric portrait of S. R. Ranganathan. The study is based on the publications as well as his citations as shown in the Google Scholar database. The study found that during 1952-2014 he received 3017 citations.

(Akakandclwa, 2008) attempts to study a biographical picture of professor Seter Siziya, who made a significant impact in the field of medicine. During 1988 to 2008, professor Seter Siziya contributed 152 papers. According to the study, Siziya has worked with 241 researchers from different institutions. A. S. Muula, E. Rudatsikira, T. Marufu, and M. Tshimanga were the top collaborators.

(Aichouchi & Gorry, 2018) describes the Hagenmüller's work. The study reveal that he published 796 papers and has more than 16,000 citations. The authors used different scientometric parameters to examined the impact of his work, collaborations and his main research topics.

(Bansal, 2018) has studied the publication output of Nobel Prize winner Arieh Warshel, who received his nobel prize in chemistry in the year 2013. Throughout 1968 to 2016, he contributed 393 publications, including 25 book chapters.

His writings are evaluated based on the year, authoring trends, and communication styls.

For the purposes of this research, the data has been retrieved from the Warshel Centre for Multiscale Simulations website.

5. Methodology

The publication data of professor Svante Pääbo have been collected from google scholar database using Publish or Perish software, which is a software program that retrieves and assesses academic citations. For further research, the papers were downloaded in a number of file formats. It was subsequently processed and analyzed using programmes like VosViewer to further analyze and visualize the downloaded data.

Professor Svante Pääbo has written 555 papers and received 125729 citations from 1974-2023. The h-index and g-index of his google scholar profile are 168 and 354 respectively.

Papers	Citations	Years	Cites_Year	Cites_Paper	Cites_Author	Papers_Author	Authors_Paper	h_index	g_index
555	125729	49	2565. 9	226. 54	38624. 03	175. 37	4. 97	168	354

6. Data Analysis

6.1 Most prolific sources

Sources	Count
Nature	49
Proceedings of the National Academy of Sciences	41
Science	27
Molecular biology and evolution	14
Genetics	9
PLoS biology	9
Nature genetics	8
Cell	7
Nucleic acids research	7
PloS one	7
The American Journal of Human Genetics	7
Genome research	6
American Journal of Human Genetics	5
Journal of Molecular Evolution	5
Science	5
Trends in Genetics	5
Current biology	4
Genome biology	4
Molecular Biology and Evolution	4
Molecular Ecology	4

Table 1- Most prolific sources

Table 1 shows the most prolific sources preferred by Svante Pääbo. We can discover from the table that Svante Pääbo published 49 publications in Nature, which is one of the leading multidisciplinary science journal. He contributed 41 publications in Proceedings of the National Academy of Sciences followed by 27 publications in Science. He also contributed 14 publications in Molecular biology and evolution.

6.2 Top publication metrics based on GS algorithm

Cites	Year	GSRank	ECC	CitesPerYear	CitesPerAuthor	AuthorCount	Age
12304	2015	1	12304	1538	12304	1	8
6042	1989	2	6042	177. 71	863	7	34
4408	2010	3	4408	339. 08	630	7	13
2450	2007	4	2450	153. 13	350	7	16
2200	2002	5	2200	104. 76	314	7	21
2195	2005	6	2195	121. 94	2195	1	18
2103	2014	7	2103	233. 67	300	7	9
2065	2010	8	2065	158. 85	258	8	13
2006	1997	9	2006	77. 15	334	6	26
1950	2012	10	1950	177. 27	279	7	11
1946	2000	11	1946	84. 61	487	4	23
1550	2004	12	1550	81. 58	221	7	19
1378	1989	13	1378	40. 53	1378	1	34
1361	2014	14	1361	151. 22	194	7	9
1236	2013	15	1236	123. 6	177	7	10
1218	2001	16	1218	55. 36	244	5	22
1186	2016	17	1186	169. 43	148	8	7
1167	2011	18	1167	97. 25	167	7	12
1112	2011	19	1112	92. 67	139	8	12
1093	2002	20	1093	52. 05	156	7	21

Table 2 Top publication metrics based on GS algorithm

Table 2 illustrates the top publications of Svante Pääbo based on Google Scholar. From this table we can observe that, 12304 citations received in the year of 2015 which acquired first GS rank (1538 cites per year), which had one authorships followed by 2nd, 3rd and 4th GS rank received in the year 1989,2010 and 2007 where he received 6042 citations (177. 71 cites per year), 4408 citations (339. 08 cites per year) and 2450 citations (153. 13 cites per year) respectively.

6.3 Most cited articles

Cites	Title	Source	ECC	Citesperyear
12304	A global reference for human genetic variation	Nature	12304	12304
6042	Dynamics of mitochondrial DNA evolution in animals: amplification and sequencing with conserved primers.	Proceedings of the National Academy of Sciences	6042	863
4408	A draft sequence of the Neandertal genome	Science	4408	630
2450	Distribution, silencing potential and evolutionary impact of promoter DNA methylation in the human genome	Nature genetics	2450	350
2200	Molecular evolution of FOXP2, a gene involved in speech and language	Nature	2200	314

2195	Initial sequence of the chimpanzee genome and comparison with the human genome	Nature	2195	2195
2103	The complete genome sequence of a Neanderthal from the Altai Mountains	Nature	2103	300
2065	Genetic history of an archaic hominin group from Denisova Cave in Siberia	Nature	2065	258
2006	Neandertal DNA sequences and the origin of modern humans	Cell	2006	334
1950	A high-coverage genome sequence from an archaic Denisovan individual	Science	1950	279
1946	Mitochondrial genome variation and the origin of modern humans	Nature	1946	487
1550	Genetic analyses from ancient DNA	Annu. Rev. Genet.	1550	221
1378	Ancient DNA: extraction, characterization, molecular cloning, and enzymatic amplification.	Proceedings of the National Academy of Sciences	1378	1378
1361	Ancient human genomes suggest three ancestral populations for present-day Europeans	Nature	1361	194
1236	Complete mitochondrial genome sequence of a Middle Pleistocene cave bear reconstructed from ultrashort DNA fragments	Proceedings of the National Academy of Sciences	1236	177
1218	Ancient DNA	Nature Reviews Genetics	1218	244
1186	The Simons genome diversity project: 300 genomes from 142 diverse populations	Nature	1186	148
1167	The evolution of gene expression levels in mammalian organs	Nature	1167	167
1112	Deep proteome and transcriptome mapping of a human cancer cell line	Molecular systems biology	1112	139
1093	Intra-and interspecific variation in primate gene expression patterns	Science	1093	156

Table 3-Most cited articles

Table 3 demonstrates the most cited articles written by the by the noble lauterate Svante Pääbo. It can be discovered from the table that "A global reference for human genetic variation" article published by Nature received both the highest number of citations (12304) and cites per author followed by "Dynamics of mitochondrial DNA evolution in animals: amplification and sequencing with conserved primers" (6042 citations) and "A draft sequence of the Neandertal genome" (4408 citations) respectively.

6.4 Total number of cited publications

Year	New	Total
1991	342	3498
1992	366	3864

1993	450	4314
1994	647	4961
1995	589	5550
1996	881	6431
1997	894	7325
1998	1004	8329
1999	1319	9648
2000	1330	10978
2001	1691	12669
2002	1745	14414
2003	2053	16467
2004	2303	18770
2005	2611	21381
2006	3297	24678
2007	3347	28025
2008	3380	31405
2009	3131	34536
2010	3701	38237
2011	4067	42304
2012	4755	47059
2013	4952	52011
2014	5850	57861
2015	5857	63718
2016	6850	70568
2017	7874	78442
2018	8276	86718
2019	9076	95794
2020	8625	104419
2021	9773	114192
2022	8914	123106
2023	2623	125729

Table 4- Total number of publications with citations

Table 4 describes the year wise citations received by the Svante Pääbo during 1991-2023. It can be find from the above table that he received total 125729 citations. Out of which in the year of 2021 he received the highest citations (9773) followed by the year of 2019 (9076) and 2022 (8914) respectively.

6.5 Authorship patterns

One authored	73	13. 15
Two authored	58	10. 45
Three authored	44	7. 92

Four authored	52	9. 36
Five authored	54	9. 72
Six authored	66	11. 89
Seven authored	147	26. 48
Eight authored	53	9. 54
Nine authored	7	1. 26
Ten authored	4	0. 72
Eleven authored	1	0. 18

Table 5- Authorship patterns

Collaboration Rate= 486/559 = 0. 86

Table 5 discuss a total of 73 (13. 15%) documents are one authored, 58 (10. 45%) documents are two authored, 44 (7. 92%) documents are three authored. Out of the remaining, she wrote 52 documents in four authorship, 54 documents in five authorship, 66 documents in six authorship, 147 documents in seven authorship and 53 (9. 54%), 7 (1. 26%), 4 (0. 72%), 1 (0. 18%) document in eight, nine, tenth and eleventh authorship respectively. The most number of publications belongs to the group of seventh authorships with 26. 48% of the total. The collaboration rate found 0. 86 which indicates that most of the work of Prof Carolyn Ruth Bertozzi was written in collaborative ways.
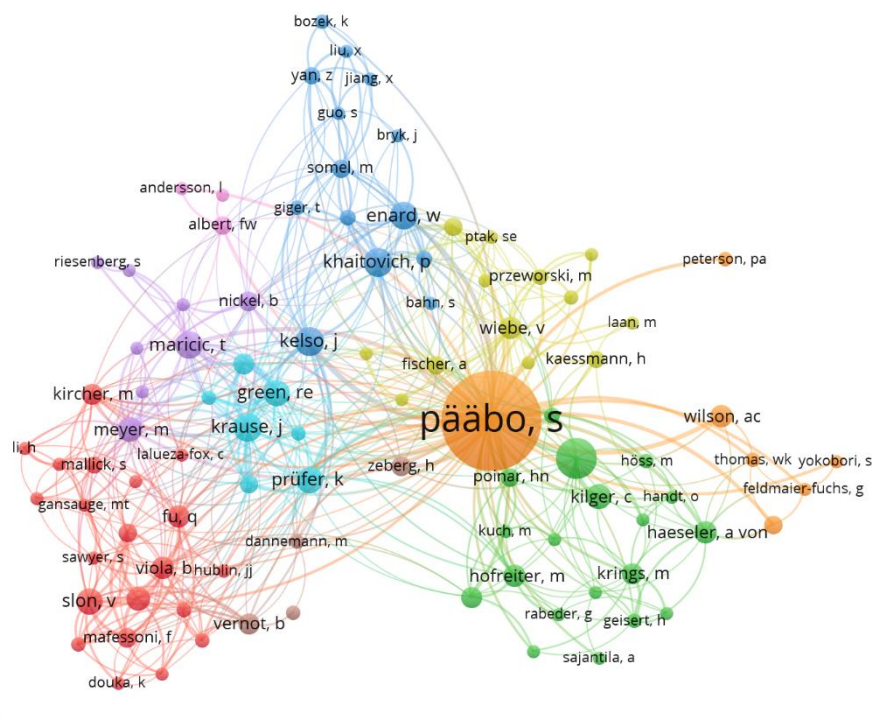

Figure 1- Author collaboration network

Figure 1 illustrates the author collaboration network generated by the VOSviewer. Out of a total of 990 authors 96 authors meet the requirement. The author of this study is assumed to have written at least 5 documents. As observed from figure 1, Prof Pääbo had very strong collaboration with Krause J, Green Re, Kelso J, Prufer, K etc.
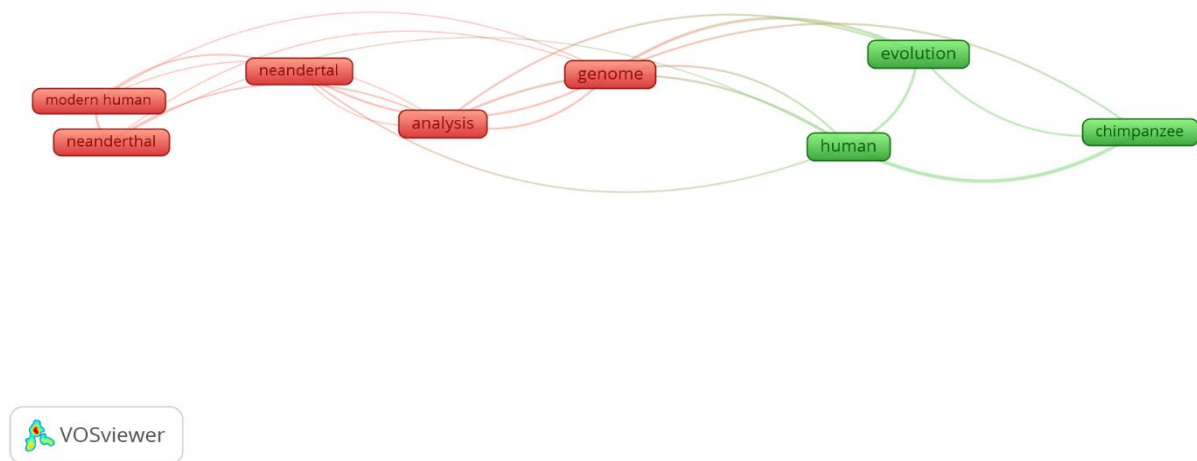

Figure 2-Visualization of Co-occurrence networks

Figure 2 shows the two clusters which are pointed out in the analysis. This analysis follows full counting method. The most occurring key terms are "analysis", "genome", "neandertal", "modern human" belonging to the red cluster, while other most visible terms are "chimpanzee", "evolution" and "human" from the green clusters.

7. Discussion and conclusion

We can conclude with the fact that the purpose of the study is to draw the scientometric sketch and to identify the academic visibility of scientist Svante Pääbo during 1974-2023. The study found that, in the year 2015, Prof. Pääbo had the most citations (12304), earning the top GS rank (1538 citations annually) with one authorship. The Nature article "A global reference for human genetic variation" received the most citations. According to the analysis, Prof. Pääbo had the most citations (12304) in 2015. According to the data, the group of seven authorships has the greatest number of publications (147, 26. 48%). Collaboration rate of 0. 86 suggests that Prof. Pääbo wrote collaboratively on the majority of his works. According to the study, Prof. Pääbo collaborated closely with Krause J, Green Re, Kelso J, Prufer, K, and other individuals. Professor Pääbo contributed the most publications (49) in Nature. The research also shows that "analysis," "genome," "neandertal," and "modern human" are the most often appearing key terms.

References

- Aichouchi, A., & Gorry, P. (2018). Paul Hagenmuller's contribution to solid state chemistry: A scientometric analysis. Journal of Solid State Chemistry, 262, 156-163.
- Akakandclwa, A. (2008). A Glimpse at a Scientist: a Scientometric Portrait of Professors Seter Siziya. Zambia Library Associatioll Journal, 23(1–2), 34–46.
- Bansal, S. (2018). Scientometric Portrait of Nobel Laureate Arieh Warshel. Journal of Advancements in Library Sciences, 5(2), 63–67.

- Bhattacharyya, P. K., & Bhattacharyya Sahu, N. (2020). Informetric Portrait of Elinor Ostrom, the Nobel Laureate in the Field of Economic Sciences. Journal of Scientometric Research, 9(2), 204–213. https://doi.org/10.5530/jscires.9.2.25
- Bhui, T., & Bhattacharyya Sahu, N. (2017). Scientometric Portrait of Dr. S. R. Ranganathan: A Study. International Journal of Library Science, 15(1).
- Google. (n.d.). About google scholar. Google. https://scholar.google.co.in/intl/en/scholar/about.html
- Mauvais-Jarvis, F. (2016). Developing academic visibility in the Medical Sciences. Ochsner journal. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5024799/
- Sinha, A. K. (2017). Scientometric study of books authored by Nobel laureate Amartya Sen. Annals of Library and Information Studies,64(1), 9-15
- The nobel prize in physiology or medicine 2022. NobelPrize.org. (n.d.). https://www.nobelprize.org/prizes/medicine/2022/press-release/