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REVIEW

Evaluating the Top Interdisciplinary Authors in Dermatology and Immunology Through Decadal Trend H-Index Analysis of 1980-2024

Megan Lau[1], Mindy D Szeto[2], Dev Patel[1], Lillian Mo[1], Kathryn Jayne Tan[1], Ester Del Duca[1], Robert P Dellavalle[3], Emma Guttman-Yassky[1]

[1]Department of Dermatology, Icahn School of Medicine at Mount Sinai, New York, NY, USA; [2]Feinberg School of Medicine, Northwestern University, Chicago, IL, USA; [3]Department of Dermatology, University of Minnesota School of Medicine, Minneapolis, MN, USA

Correspondence: Emma Guttman-Yassky, Department of Dermatology, Icahn School of Medicine at Mount Sinai, 5 E 98th Street, New York, NY, 10029, USA, Tel +1 212-241-9728/3288, Fax +1 212-876-8961, Email emma.guttman@mountsinai.org

Objective: Previous bibliometric analyses focus on primary specialty, potentially overlooking authors whose contributions span multiple disciplines. Given the increasing recognition of dysregulated immunological processes in dermatological conditions and the targeting of immune pathways in therapeutics, this study aims to evaluate the h-index of authors in both dermatology and immunology, capturing the multifaceted research landscape of dermatology and providing a comprehensive assessment of scholarly impact.

Methods: A search of the Web of Science (WOS) schema from 1980 to 2024 was conducted using the InCites dataset, limited to original articles, editorial materials, and meeting abstracts, and authors were ranked by InCites h-index.

Results: Over the past 5 years, the top 20 authors by InCites h-index in dermatology and immunology research were 65% males and 35% females, with USA (30%), Germany (20%), and France (15%) representing the highest proportions of authors. The trends across decades showed increased representation of female authors, presence of institutions outside the United States, and cross-disciplinary productivity in dermatology and immunology.

Conclusion: The cross-disciplinary associations in dermatology underscore the utility of the h-index in assessing scholarly impact across multiple fields. The observed growth in interdisciplinary productivity and global representation among leading authors reflects translational research exploring immune pathways and molecular profiles that have driven the advancement and translational revolution of immunology-based therapies in dermatology.

Keywords: h-index, scholarly influence, interdisciplinary citations, bibliometric analysis

Introduction

Proposed by Hirsch in 2005, the h-index measures a researcher's impact based on the number of publications and citations.[1] The metric varies across disciplines and may require standardization for direct comparisons across specialties.[1] Despite this variability, the interdisciplinary nature of research allows the h-index to reflect broader scholarly influence beyond a researcher's primary field. To date, this is the first study to evaluate the h-index of authors in dermatology and immunology.

Szeto et al examined the top dermatologic authors using the h-index from 1980 to 2020 and used Web of Science (WOS) category field WC = "dermatology" to filter publications.[2] However, bibliometric analyses based on primary specialty or departmental affiliation may overlook authors whose contributions span across interdisciplinary fields. In this study, our comprehensive search approach integrates dermatology and immunology to reflect the multifaceted research landscape of dermatology.

Interdisciplinary citation metrics are important for evaluating scientific impact, especially in translational medicine, as they capture the dissemination of ideas across different disciplines. Translational advances that improve patient outcomes often emerge from multidisciplinary efforts, and prior studies have shown that research with higher levels of

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interdisciplinary citation demonstrates more sustained long-term impact.[3] Prior studies mapping immune profiles in dermatologic conditions and immune-targeted therapies have improved patient outcomes, optimized response rates, and are used to guide treatment in both responders and non-responders, allowing a more personalized approach to dermatologic care.[4,5] The h-index metric can capture interdisciplinary influence by reflecting sustained cross-disciplinary citation and integrating productivity with citation impact across diverse fields; however, it may have limitations in distinguishing between highly specialized or field-specific contributions within interdisciplinary research.[6]

Investigations of immunopathological mechanisms have led to targeted therapies that revolutionized dermatologic treatment, with immune pathways playing a central role in the pathogenesis of common skin conditions such as psoriasis (IL23/Th17-driven), atopic dermatitis (Th2-driven), lichen planus (Th1-driven), and lupus erythematosus (type-II-IFN-involvement).[5,7] Transcriptomic, proteomic, and cytokine analysis of skin and blood have identified key biomarkers, shown the immune molecular profiles of skin conditions, driven the expansion of systemic therapeutics, and established the groundwork for personalized medicine in dermatology.[8] Given the cumulative integration of immunology within dermatologic research and the broader shift toward immune-targeted therapies, this study is the first to assess the h-index of authors publishing in both disciplines to comprehensively characterize scholarly impact.[9] This analysis provides a quantitative framework to identify fundamental contributors establishing the foundation of translational research in dermatology and benchmark institutional and investigator impact, thus offering insights to guide global collaborations and understand long-term scholarly impact that has shaped the field.

Methods

A search from 1980 to 2024 of the WOS schema was conducted on December 30, 2024, using the InCites dataset and WOS researcher profiles. The query criteria were set to research areas "dermatology" and "immunology" and limited to original articles, letters, editorial materials, and meeting abstracts. Research profiles focused exclusively on immunology or dermatology, with no publications in the respective field, were excluded from the analysis. Authors were ranked by InCites h-index, and gender, Google Scholar H-index, and Scopus H-index were presented based on Google searches of full names and the authors' last-known institutional affiliation.

The dataset included bibliometric and demographic variables for leading contributors in immunology and dermatology, organized by decade. Data extracted from WOS included decade, country, affiliation, times cited, percentage of documents cited, number of immunology articles, number of dermatology articles, Category Normalized Citation Impact (CNCI), and number of documents cited. The data were used to evaluate trends in author gender representation, geographic distribution, research productivity, and citation impact across decades.

Results

Gender and Geographic Representation Among Leading Authors

From 1980 to 1989, all contributors of dermatology and immunology were male (100%) (Table 1). During 1990–1999, female authorship emerged at 5%, and continued to increase to 15% in 2000–2009, and reached 35% in 2020–2024 (Table 1 and Table 2). In 1980-1989, most contributors originated from the United States (85%), with smaller representation from Brazil (5%) and France (5%) (Table 1). Over the recent 5 years, the top-ranked authors by InCites h-index were more dispersed with representation in the USA (30%), followed by Germany (20%) and France (15%) (Table 2).

Growth in Scholarly Impact of Dermatology and Immunology Integration

Across four decades (1980s–2010s), authors in dermatology and immunology demonstrated a continual increase in bibliometric influence (Table 1 and Table 2). The mean WOS h-index increased from 40.6 in the 1980s to 54.2 in the 2010s, with the maximum individual h-index reaching 76 in the most recent decade (Table 1). The mean CNCI of authors in both disciplines increased from 2.75 ± 1.24 in 1980–1989 to 4.13 ± 1.44 in 2010–2019 (Table 1). Overall, 50% of the top-ranked authors in 2020–2024 have a CNCI above 4, demonstrating research impact 4 times above the global average in their interdisciplinary fields (Table 2).

Table 1 Top 20 Dermatology and Immunology h-Index Authors by Decade, 1980–2020

Decade	Name	Rank Based on H-index	Gender	Country or Region	Affiliation	WOS InCites H-Index	Times Cited	% Docs Cited	Number of Immunology Articles	Number of Dermatology Articles	Category Normalized Citation Impact	Documents Cited	Google Scholar H-Index	Scopus H-Index
1980-1989	Austen, K. Frank	1	M	USA	Brigham & Women's Hospital	57	11,905	83.67	144	8	2.51	123		128
	Oppenheim, Julius J.	2	M	USA	Massachusetts Institute of Technology (MIT)	53	12,898	72.22	126	8	3.15	91		16
	Steinman, Ralph	3	M	USA	Rockefeller University	49	10,970	92.86	76	6	4.45	65		165
	Frank, MM	4	M	USA	International Business Machines (IBM)	45	6185	94.06	99	7	1.69	95		
	Katz, S. I.	4	M	USA	NIH National Institute of Arthritis & Musculoskeletal & Skin Diseases (NIAMS)	45	6463	73.72	28	114	2.53	101		
	Gleich, Gerald J.	4	M	USA	University of Utah	45	8794	77.27	120	17	3.02	102		118
	Winkelmann, RK	7	M	USA	Mayo Clinic	44	5869	82.63	2	231	1.50	176		75
	Haynes, Barton F.	8	M	USA	Duke University	40	5753	87.69	63	9	2.40	57		134
	Voorhees, JJ	8	M	USA	University of Michigan	40	5098	78.71	159	5	3.16	122		112
	Engleman, Edgar G.	10	M	USA	Stanford University	39	5179	87.34	77	8	1.99	69		91
	Streilein, J. Wayne	11	M	USA	University of Texas Southwestern Medical School	38	5473	85.83	86	48	1.92	109		89
	Geha, Raif S.	11	M	USA	Boston Children's Hospital	38	4660	84.52	92	3	1.98	71		116
	Morimoto, C	13	M	Japan	Ehime University	37	6281	93.75	68	1	2.64	60	100	79
	Butcher, Eugene C.	13	M	USA	Stanford University	37	10,493	92	51	5	5.31	46	169	147
	Bergstresser, Paul R.	15	M	USA	University of Texas Southwestern Medical Center Dallas	36	4521	73.63	16	78	2.73	67		62
	Santos, Gledson Weslley Pereira	16	M	Brazil	Universidade Federal do Maranhao	35	5524	92.31	72	9	2.42	72		
	Thivolet, J.	17	M	France	Unité Inserm U1077	34	4312	59.38	36	413	0.89	250		49
	Nussenzweig, Michel C.	17	M	USA	New York University	34	7569	84.85	70	3	3.40	56		
	Askenase, Philip	19	M	USA	Yale University	33	3488	92.06	61	5	1.53	58		62
	Bhan, Atul K	20	M	USA	Massachusetts General Hospital	32	8042	97.73	29	17	5.80	43		95

(*Continued*)

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Table 1 (Continued).

Decade	Name	Rank Based on H-index	Gender	Country or Region	Affiliation	WOS InCites H-Index	Times Cited	% Docs Cited	Number of Immunology Articles	Number of Dermatology Articles	Category Normalized Citation Impact	Documents Cited	Google Scholar H-Index	Scopus H-Index
1990-1999	Mak, Tak W.	1	M	Canada	University Health Network Toronto	67	21,307	93.33	154	9	3.31	126		190
	Banchereau, J.	2	M	USA	Jackson Laboratory	65	20,731	86.36	181	13	3.00	133		149
	Linsley, P. S.	3	M	USA	Benaroya Research Institute	63	22,236	88.1	127	11	4.20	111		109
	Kraft, Dietrich	4	M	Austria	Medizinische Universitat Wien	56	8855	89.23	163	13	1.89	116		86
	Ledbetter, Jeffrey	4	M	USA	Bristol-Myers Squibb	56	17,846	92.98	118	8	3.55	106		106
	Steinman, Ralph	4	M	USA	Rockefeller University	56	20,995	90.91	87	6	6.34	70		165
	Feldmann, M.	7	M	England	University of Oxford	50	8316	92.13	95	7	2.03	82		121
	Modlin, Robert L	8	M	USA	University of California Los Angeles	49	13,344	72.64	93	29	2.96	77	140	116
	Ohashi, Pamela S.	9	F	Canada	Princess Margaret Cancer Centre	46	9815	97.4	83	3	2.73	75	111	102
	Voorhees, JJ	9	M	USA	University of Michigan	46	7472	61.36	4	240	2.05	135		112
	Cooper, Kevin	11	M	USA	Washington State University	45	5777	73.01	23	151	1.97	119	96	77
	Griffiths, Christopher E.M.	11	M	England	University of Manchester	45	6789	79.85	4	144	2.55	107	154	121
	Orfanos, Constantin E.	13	M	Germany	Dermatologic Center Berlin	44	6155	76.26	12	289	1.32	196	89	73
	Tschopp, J.	13	M	Switzerland	University of Lausanne	44	12,343	84.72	63	15	3.85	61		160
	Streilein, J. Wayne	15	M	USA	Harvard Medical School	43	5921	71.86	114	82	1.42	120		89
	Baggiolini, Marco	16	M	Switzerland	Swiss Natl Supercomp Ctr	42	11,710	90.74	60	6	5.75	49		108
	Paus, Ralf	17	M	England	University of Manchester	41	4206	51.19	12	169	1.81	86		119
	Kapp, Alexander	17	M	Germany	Hannover Medical School	41	4503	86.54	63	56	1.51	90	98	85
	Nickoloff, Brian J.	19	M	USA	Eli Lilly	40	6194	69.53	24	118	2.76	89		100
	Ellis, Charles	20	M	USA	University of Michigan	39	4668	92.21	1	87	2.86	71	86	70

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2000-2009	Steinman, Ralph	1	M	USA	Rockefeller University	64	22,463	89.09	113	14	4.28	98		165
	Griffiths, Christopher E.M.	2	M	England	University of Manchester	58	10,501	88.96	13	178	3.76	145	154	121
	Elias, Peter M.	2	M	USA	University of California San Francisco	58	8379	58.24	6	177	3.00	99	9	132
	Wahn, U.	4	M	Germany	Charite Universitatsmedizin Berlin	57	12,063	77.54	201	8	2.10	145	132	110
	Von Mutius, Erika	4	F	Germany	University of Munich	57	13,388	86.61	115	5	2.72	97		111
	Ortonne, Jean-Paul	6	M	France	CHU Nice	54	8834	75.23	7	224	2.18	167		95
	Cyster, Jason G.	7	M	USA	University of California San Francisco	49	18,187	96.3	68	1	6.15	52		113
	Lanzavecchia, Antonio	7	M	Italy	Humabs Biomed	49	18,727	89.39	78	3	6.00	59	167	143
	Gallo, Richard	9	M	USA	University of California San Diego	48	11,922	54.9	49	119	3.72	84	150	124
	Canonica, Giorgio Walter	9	M	Italy	Humanitas University;	48	8729	70.87	261	4	1.52	146	143	115
	Werfel, Thomas	11	M	Germany	Hannover Medical School	47	6451	65.43	78	100	1.40	106	19	90
	Von Andrian, Ulrich H	12	M	USA	Harvard Medical School	46	14,378	76.62	92	6	3.62	59	137	118
	Paus, Ralf	13	M	England	University of Manchester	44	5519	47.92	11	245	1.80	115		119
	Volk, Hans-dieter	13	M	Germany	Charite Universitatsmedizin Berlin	44	8121	65	187	36	0.96	130	133	114
	Johansen, Jeanne	13	F	Denmark	Herlev & Gentofte Hosp	44	5591	99.1	4	117	1.87	110		76
	Girolomoni, Giampiero	16	M	Italy	University of Verona	43	6895	68.79	40	122	1.40	97	113	93
	Kapp, Alexander	16	M	Germany	Hannover Medical School	43	5947	80.71	75	81	1.33	113	98	85
	Broecker, Eva-Bettina	16	F	Germany	University of Wurzburg	43	5799	73.66	47	178	1.01	151		8
	Ruzicka, Thomas	16	M	Switzerland	University of Zurich	43	7434	90	23	107	1.97	108		99
	Andersen, Klaus Ejner	16	M	Denmark	University of Southern Denmark;	43	4833	95.16	12	115	1.45	118	83	68

(*Continued*)

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Table 1 (Continued).

Decade	Name	Rank Based on H-index	Gender	Country or Region	Affiliation	WOS InCites H-Index	Times Cited	% Docs Cited	Number of Immunology Articles	Number of Dermatology Articles	Category Normalized Citation Impact	Documents Cited	Google Scholar H-Index	Scopus H-Index
2010-2019	Krueger, James G.	1	M	USA	Rockefeller University	76	18,572	90.53	94	116	5.52	172	151	134
	Maurer, Marcus	2	M	Germany	Charite Universitatsmedizin Berlin	66	17,527	54.7	366	295	2.31	332	143	112
	Guttman-Yassky, Emma	3	F	USA	Icahn School of Medicine at Mount Sinai	64	15,976	61.78	108	175	6.17	160	112	97
	Reich, Kristian	3	M	Germany	University Medical Center Hamburg-Eppendorf	64	17,059	51.47	9	528	3.93	263		97
	Papp, Kim	5	F	Canada	Probity Medical Research Inc	63	17,796	63.64	6	350	5.72	217	109	96
	Silverberg, Jonathan	6	M	USA	George Washington University;	58	13,705	63.31	88	330	3.34	245		88
	Ginhoux, Florent	7	M	Singapore	Agency for Science Technology & Research (A*STAR)	56	20,757	70.63	136	13	5.46	89	129	117
	Simpson, Eric	8	M	USA	Oregon Health & Science University	53	16,049	68.72	41	184	6.85	145	98	82
	Mckenzie, Andrew	8	M	England	MRC Laboratory Molecular Biology	53	14,818	74.26	110	7	4.17	75	18	107
	Malissen, Bernard	10	M	France	Aix-Marseille Universite	52	13,466	79.65	115	10	3.47	90		101
	Canonica, giorgio walter	10	M	Italy	Humanitas University	52	12,595	70.39	274	10	2.40	145	143	115
	Tang, Mimi	12	F	Australia	Murdoch Children's Research Institute	49	9776	76	185	4	5.27	133	97	83
	Worm, Margitta	12	F	Germany	Free University of Berlin	49	11,234	62.2	170	104	2.59	158		92
	Gallo, Richard	14	M	USA	University of California San Diego	48	7409	52.75	59	175	3.44	115	150	124
	Margolis, Daniel J. A.	14	M	USA	Weill Cornell Medicine	48	10,676	74.21	24	145	4.09	118	56	46
	Paller, Amy S.	14	F	USA	Northwestern University	48	11,709	59.64	40	261	3.82	167	90	96
	Dinarello, Charles	17	M	Netherlands	Radboud University Nijmegen	47	8596	81.74	121	17	5.57	94		204
	Szepietowski, Jacek C.	17	M	Poland	Wroclaw University of Science & Technology	47	10,616	62.79	9	319	3.20	189	90	71
	Sicherer, Scott	19	M	USA	Icahn School of Medicine at Mount Sinai	46	11,499	65.92	194	5	3.67	118		97
	Sparwasser, Tim D	20	M	Germany	Johannes Gutenberg University of Mainz	45	7612	70.2	147	12	1.56	106	89	76

Notes: * Google Scholar is only available for authors with a Google Scholar profile. WOS InCites data (h-index, Times Cited, CNCI) were obtained from Clarivate Web of Science. Google Scholar h-index values were obtained from available Google Scholar profiles. Scopus h-index values were obtained from Elsevier Scopus. All metrics were extracted in [December 2024].
Abbreviations: F, Female; M, Male; USA, United States of America.

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Table 2 Top 20 Dermatology and Immunology Authors by h-Index, 2020–2024

Name	Rank Based on WOS H-Index	Gender	Country	Affiliation	WOS Incites H-Index	Times Cited	# of Immunology Articles	# of Dermatology Articles	CNCI	Google Scholar H-Index*	Scopus H-Index
Guttman-Yassky, Emma	1	F	USA	Icahn School of Medicine at Mount Sinai	37	5786	101	276	4.26	112	97
Reich, Kristian	2	M	Germany	University Medical Center Hamburg-Eppendorf	36	4299	7	241	5.07		97
Casanova, Jean-Laurent	2	M	France	Institut National de la Sante et de la Recherche Medicale (Inserm)	36	8498	199	6	3.83	184	155
Simpson, Eric	4	M	USA	Oregon Health & Science University	35	5832	37	422	4.82	98	82
Fabbrocini, Gabriella	5	F	Italy	University of Naples Federico II	34	4507	11	466	2.66		58
Silverberg, Jonathan	6	M	USA	George Washington University	32	5369	39	411	3.10		88
Papp, Kim	7	M	Canada	Probity Medical Research Inc	31	3411	7	170	5.02	109	96
Maurer, Marcus	7	M	Germany	Charite Universitatsmedizin Berlin	31	3906	112	305	4.99	143	112
Ginhoux, Florent	7	M	Singapore	Agency for Science Technology & Research (A*STAR)	31	3259	4	91	5.73	129	117
Paller, Amy S.	10	F	USA	Northwestern University	29	4013	39	297	3.12	90	96
Megna, Matteo	11	M	Italy	University of Naples Federico II	28	1796	4	206	3.54		39
Puel, Anne	11	F	France	Hopital Universitaire Necker-Enfants Malades - APHP	28	6513	3	89	6.37	96	87
Thyssen, Jacob	13	M	Denmark	University of Copenhagen	25	3523	29	322	2.77		77
Krueger, James G.	13	M	USA	Rockefeller University	25	2461	36	70	4.94	151	134
Szepietowski, Jacek C.	13	M	Poland	Wroclaw University of Science & Technology	25	2662	13	326	3.08	90	71
Paul, Carle	16	M	France	Universite Federale Toulouse Midi-Pyrenees (ComUE)	24	2357	10	101	4.65	99	79
De Bruin-Weller, Marjolein S.	16	F	Netherlands	Utrecht University Medical Center	24	2515	29	138	3.78		46
Pavel, Ana B.	16	F	USA	Icahn School of Medicine at Mount Sinai	24	1615	30	32	2.91	42	40
Worm, Margitta	16	F	Germany	Free University of Berlin	24	2782	94	104	8.01		92
Pfaar, Oliver	16	M	Germany	Philipps University Marburg	24	2016	107	1	2.35		71

Notes: *Google Scholar is only available for authors with a Google Scholar profile. WOS InCites data (h-index, Times Cited, CNCI) were obtained from Clarivate Web of Science. Google Scholar h-index values were obtained from available Google Scholar profiles. Scopus h-index values were obtained from Elsevier Scopus. All metrics were extracted in [December 2024].

Abbreviations: F, Female; M, Male; USA, United States of America; #, number; CNCI, Category Normalized Citation Impact.

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Expansion of Cross-Disciplinary Productivity

From 1980 to 1989, top-ranked authors aggregately produced 1475 immunology and 995 dermatology publications (Table 1). In 2010–2019, output increased to 2296 immunology and 3060 dermatology publications (Table 1). As immunology directed the bibliometric footprint of top-ranked authors in earlier decades, the dataset reveals a progressive shift as dermatology publications grew at a faster rate than immunology output, narrowing the disciplinary gap. The scope of dermatology research expanded substantially over the study period per author. In 1980–1989, highly ranked authors produced an average of approximately 50 dermatology publications, increasing to over 150 in 2010–2019 with nearly a threefold rise (Table 1). Immunology-related publications also increased, from an average 74 in earlier decades to 115 in the 2010s, reflecting growing cross-disciplinary activity (Table 1).

Discussion

Our analysis indicates sustained growth in the bibliometric influence of dermatology and immunology authors over four decades through quantification of impact across interdisciplinary fields and identifies key drivers of translational research, benchmarks investigator impact, and informs funding decisions, academic advancement, and cross-disciplinary collaboration. Previous bibliometric studies have largely examined dermatology exclusively or over shorter time intervals. The trends of both disciplines are similar to Szeto et al; in which the ranking of top h-index authors in exclusively dermatology by decade demonstrated an increasing proportion of female authors across decades and an expanded presence of institutions outside the United States and the United Kingdom.[2] However, the increasing presence of authors from other countries signals the growing globalization of research, driven by increased international collaboration between institutions.[10]

The findings from the analysis expand the literature on cross-disciplinary productivity. While immunology initially dominated the bibliometric footprint in the 1980s, dermatology output grew at a faster rate, reflecting both the expansion of dermatology as a research field and the increasing integration with immunology. These findings support the paradigm shift in translational dermatology in which advances in inflammatory skin disease research and understanding immunopathomechanisms have revolutionized the therapeutic repertoire.[11]

The trajectory of dermatology integration with immunology parallels therapeutic innovation. Many of the transformative therapeutics in dermatology, including biologics targeting TNF-α, IL-17, and IL-23, and small-molecule inhibitors, originated from fundamental immunological research and further application to skin disease.[12] Immunology has supported major therapeutic advances in dermatology including dupilumab, an IL-4 receptor alpha antagonist, in which the mechanism comes from foundational immunologic research.[12] Dupilumab now carries multiple indications for dermatologic skin disease including atopic dermatitis, chronic spontaneous urticaria, and bullous pemphigoid.[13]

When available, Google Scholar and Scopus h-indices were consistently higher than InCites h-index as the InCites h-index is calculated within a specified time frame, whereas Google Scholar and Scopus account for all published articles.[2,14] Other metrics including g-index have stronger emphasis on highly cited papers, the i10-index includes publications with at least 10 citations, and Altmetric scores reflect real-time online attention with how many times the articles and authors are mentioned.[15,16] The h-index incorporates productivity and citations and the cross-disciplinary associations in dermatology highlight the potential utility of the h-index in capturing an author's broader scholarly impact that extends across multiple adjacent fields. However, the h-index has several limitations, including its bias toward career length, inability to account for author rank, variation depending on the citation database, and tendency to favor established disciplines, potentially underestimating researchers in emerging disciplines where citations accumulate more slowly.[1] Future research can supplement h-index with complementary metrics by including author contribution, seniority, and h-index across different databases to ensure a more extensive evaluation of scientific contributions and influence.

Disclosure

Emma Guttman-Yassky is an employee of Mount Sinai and has received research grants from and/or is a consultant for Abbvie, Arcutis, Almirall, Amgen, AnaptysBio, Apogee Therapeutics, Apollo Therapeutics Limited, Artax Biopharma

Inc., Aslan, Astria, Bristol Myers Squibb, Boerhinger-Ingelhiem, Calliditas, Cara Therapeutics, Celldex, Centrexion Therapeutics Corporation, Concert, Connect Biopharm, Coty, DBV Technologies, Eli Lilly, Enveda Biosciences, Escient Pharmaceuticals, Inc., Fairmount Funds Management LLC, FL2022-001, Inc., Galderma, Gate Bio, Google Ventures (GV), GSK Immunology, Incyte, Inmagene, Janssen Biotech, Jasper Therapeutics, Kymera Therapeutics, Kyowa Kirin, Leo Pharma, Matchpoint Therapeutics, Merck, Nektar Therapeutics, Novartis Pharmaceuticals, NUMAB Therapeutics AG, Nuvig, OrbiMed Advisors LLC, OTSUKA, Pfizer, Pharmaxis Ltd, Pioneering Medicine VII, Inc., Proteologix US Inc, Q32Bio, RAPT, RayThera, Inc, Regeneron Pharmaceuticals, RibonTherapeutics, Inc., Rocatinlimab, SAGIMET Bioscieces, Sanofi, SATO, Schrödinger, Inc., Sitryx, Sun Pharma Advanced Research Company (SPARC), Takeda, Teva Branded Pharmaceutical Products R&D, Inc, TRex, UCB, Ventyx Biosyences. The rest of the authors declare that they have no relevant conflicts of interest.

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