



Bibliometric analysis of worldwide research trends on tumor burden and immunotherapy: a correspondence

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In our recent scholarly endeavor, we delved deeply into the insightful work by Zhang *et al.*^[1], titled ‘Worldwide research trends on tumor burden and immunotherapy: a bibliometric analysis’. This study was undertaken with the aim of conducting a rigorous analysis of the evolving landscape of research, collaborative efforts, and knowledge dissemination in the realms of tumor burden and immunotherapy over the past 35 years. The objective was to uncover significant insights in this field and to forecast future trends through bibliometric analysis. However, we feel compelled to offer some constructive critiques regarding the information retrieval methodologies employed in this research.

The precision in formulating search strategies is of utmost importance in bibliometric analysis. The authors noted that their primary data were sourced from the Web of Science Core Database (WoSCC), encompassing a diverse array of 10 sub-databases. These include the Science Citation Index Expanded (SCI-EXPANDED), the Social Sciences Citation Index, and the Emerging Sources Citation Index, among others. Prior studies have suggested that including all these sub-databases might not be optimal for sourcing relevant articles. For instance, employing the retrieval formula adhered to by the authors yielded no pertinent studies within the confines of the Arts & Humanities Citation Index (A&HCI), Current Chemical Reactions (CCR-EXPANDED), and Index Chemicus (IC)^[2]. In concurrence with this perspective, some erudite scholars argue that amalgamating a

diverse range of databases in a single bibliometric analysis may not be prudent. The SCI-EXPANDED, in particular, is often regarded as the most appropriate for such studies. Therefore, it is crucial for researchers to clearly specify the databases used to enhance the transparency and replicability of their data retrieval process.

Another crucial aspect that merits emphasis is the applicability of Topic Search (TS) in bibliometric evaluations. ‘TS,’ by design, identifies a study as relevant if the search term appears in the ‘Title (TI),’ ‘Abstract (AB),’ ‘Author Keywords (AK),’ or ‘Keywords Plus (KP).’ It is essential to note that ‘KP’ is derived from WoSCC’s automated algorithms, not directly from the authors. This can lead to the unintentional inclusion of a multitude of unrelated publications in the search results^[3]. Based on our empirical observations, a more judicious approach involves the utilization of ‘TI,’ ‘AB,’ and ‘AK’ as selection criteria, ensuring a dataset that is both more accurate and relevant for bibliometric analysis^[4].

Additionally, an integral element in bibliometrics is the development of effective search terms and strategies. The success of a search formula largely depends on its comprehensiveness. A narrow approach might overlook significant studies. For instance, in Zhang *et al.*’s research, the used search strategy: (TS=(tumor burden OR tumour burden OR tumor load OR tumour load) AND (TS=immunotherapy OR immunotherapies OR immunotherapeutic OR immunotherapeutics)) to identify tumor burden and immunotherapy-related literature. We contend that this is insufficient for locating all tumor burden and immunotherapy-related literature. For example, in this study, the author used (TS=(tumor burden OR tumour burden OR tumor load OR tumour load)) was deemed insufficient for encompassing the entirety of literature related to tumor burden and immunotherapy. The previous study offers a detailed example of searching for cancer-related studies using the following terms: “cancer* OR tumor* OR tumour* OR oncology OR neoplasm* OR carcinoma*^[5]. In addition, the authors could improve the search terms by incorporating wildcard characters such as “*”, which allow for variations in keyword endings. For example, “immunotherap*” would return “immunotherapy”, “immunotherapies”, “immunotherapeutic”, and “immunotherapeutics”, etc. Our proposed search methodology is detailed in Supplementary Table S1 (Supplemental Digital Content 1, <http://links.lww.com/JS9/B888>), featuring a flowchart outlining the search and selection process.

A point of ambiguity arises from Zhang’s article concerning the discrepancy between the total number of articles retrieved (7831) (Supplementary Table S2, Supplemental Digital Content 1, <http://links.lww.com/JS9/B888>) and the number mentioned in the article (1030). It remains unclear whether the authors

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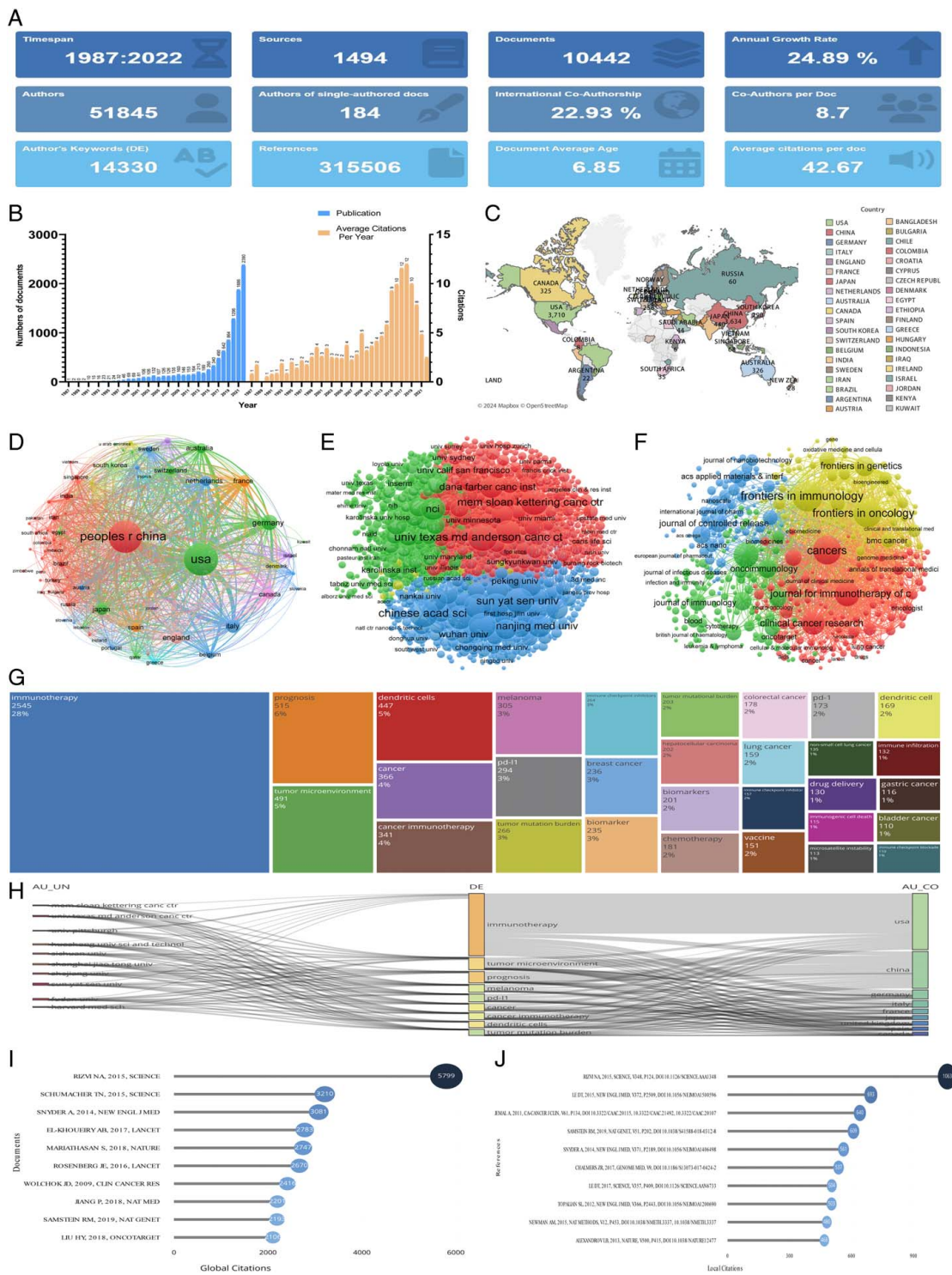


Figure 1. A comprehensive bibliometric analysis of tumor burden and immunotherapy. (A) This segment presents an overview of the topic within the Web of Science Core Database (WOSCC) and Science Citation Index Expanded (SCI-EXPANDED), utilizing the 'Bibliometrix' package. (B) The trajectory of annual publications and citations over the past 35 years. (C) A Global Map illustrating the scientific productivity of various countries in this specific field. (D-F) A VOSviewer visualization diagram of the networks of cooperation between different countries, institutions, and journals. Each node (circle) in these networks corresponds to either a country, institution, or journal, with the size of the circle reflecting the number of articles published. Larger circles indicate a higher volume of publications. The interconnecting lines represent collaborative relationships, and the different colors of these networks signify distinct collaborative clusters. (G) A treemap is used to represent the frequency of authors' keywords within the scope of tumor burden and immunotherapy. (H) The three-field plot provides a comprehensive view of the keywords plus analysis (left field: institutions; middle field: keywords; right field: countries). (I) Top 10 Most Global Cited Documents and (J) Most Local Cited References in the field of tumor burden and immunotherapy.

conducted a more thorough manual search to filter out irrelevant literature or if there were other reasons for this inconsistency. In our refined search, conducted from 1 January 1987 to 31 December 2022, and completed on 6 January 2024, we identified a total of 10 949 records. After a careful exclusion of unrelated literature, we finalized a selection of 10 442 English articles for analysis, consisting of 8255 research articles and 2187 review articles. This selection showed an annual growth rate of 24.89%. A comprehensive overview of these publications is presented in Figure 1A. The literature on ‘tumor burden and immunotherapy’ demonstrates a significant upward trend over the past 35 years, with a notable increase post-2018, reaching a peak in 2022 with 2390 articles (Fig. 1B), leading in contributions with 3710 articles, followed by China (3634 articles) and Germany (789 articles), among others (Fig. 1C, D). The University of Texas MD Anderson Cancer Center in the USA ranks first with 242 articles in the field, followed by the Chinese Academy of Sciences with 231 articles (Fig. 1E). ‘Frontiers in Immunology’ emerged as the leading publisher in this research area with 346 articles (Fig. 1F). A treemap representation highlights ‘immunotherapy’ as the most frequent keyword (Fig. 1G). Figure 1H further illustrates the distribution of core topics across institutions and countries in this field. Figure 1I, J showcases the top 10 most globally cited documents and most locally cited references, offering insights into the seminal literature in this domain.

Comparative to Zhang *et al.*’s findings, our research has revealed a significantly larger body of literature on tumor burden and immunotherapy, encompassing 10 442 articles versus the 1030 or 7831 identified in their study. It is vital to underscore that substantial variations in publication numbers can markedly affect a range of quantitative metrics. These include publication counts, citation numbers, leading countries, institutions, authors, journals, keywords, and references. Such fluctuations underscore the critical importance of meticulously crafting an appropriate retrieval formula, which forms the bedrock of any objective bibliometric analysis. In summation, while acknowledging the contributions of Zhang *et al.*, we posit that our refined methodology offers enhanced precision and accuracy in analyzing research trends related to tumor burden and immunotherapy over the previous three-and-a-half decades. Our findings not only expand upon their work but also underscore the significance of a methodologically rigorous approach in bibliometric studies.

Ethical approval

Not available.

Consent

Not available.

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Author contribution

J.-W.G.: formal analysis, methodology, software, and writing – original draft; Q.L.: data curation, formal analysis, methodology, and software; W.-X.Q.: formal analysis and methodology; X.-Y.L.: data curation; Y.-D.M.: conceptualization, formal analysis, funding acquisition, methodology, software, and writing – review and editing. All authors reviewed the manuscript.

Conflicts of interest disclosure

The authors declare no conflicts of interest.

Guarantor

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Data availability statement

The datasets used during the present study are available from the corresponding authors upon reasonable request.

Provenance and peer review

This paper wasn’t an invited paper.

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