

From Data to Discovery: Scientometric Analysis of Plaque Psoriasis and Preliminary In Vitro Efficacy Studies Using *Sigesbeckiae Herba*

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ABSTRACT

A recent scientometric analysis of plaque psoriasis research from 2000 to 2025 indicates a significant increase in scholarly activity, with 13,646 documents highlighting the field's growing importance. This growing research momentum aligns with global health priorities, particularly those outlined in SDG 3, which emphasizes improving health outcomes and reducing disease burdens. The United States was the leading contributor, followed by Italy, Canada, and China, while the British Journal of Dermatology and other publications were recognised as the most prolific. Research themes focus on comorbidities, interleukin-23, and drug survival, with interdisciplinary connections to conditions such as diabetes and depression also acknowledged. This overview highlights the need for enhanced collaboration and innovative strategies, including the integration of traditional herbal treatments, to effectively improve the understanding and management of plaque psoriasis. Psoriasis is a common chronic inflammatory skin disorder characterised by excessive proliferation of keratinocytes, with the underlying mechanisms not yet fully understood. This study investigated the effects of *Sigesbeckiae Herba* on cultured human keratinocytes (HaCaT cells) in vitro. The findings indicated that extracts from *Sigesbeckiae Herba* (including *Sigesbeckia orientalis* L., *S. pubescens* Makino, and *S. glabrescens* Makino) concentration-dependently enhanced cell viability and reduced the expression of inflammatory cytokines in stimulated HaCaT cells. Furthermore, treatment with the 50% ethanolic extracts of *Sigesbeckiae Herba* significantly decreased MDA levels while increasing SOD, CAT, and GSH levels in a concentration-dependent manner. Our findings suggest that *Sigesbeckiae Herba* warrants further investigation in vitro and in vivo, as it may prove to be a promising source for treating plaque psoriasis. It functions as an effective antioxidant with a terpenoid-rich profile, as evidenced by previous literature on *Sigesbeckiae Herba*, which appears optimistic for the treatment of plaque psoriasis. Being a natural source with a reduced number of side effects, this can be a sustainable choice to be considered for further research.

AIMS AND OBJECTIVES

The aim of this research is to examine the impact of *Sigesbeckiae Herba* on cultured human keratinocytes (HaCaT cells) in vitro, concentrating on several critical factors. The primary objective of the study is to assess the concentration-dependent effects of *Sigesbeckiae Herba* extracts on the viability of HaCaT cells. Second, it aims to evaluate the efficacy of these extracts in diminishing the expression of inflammatory cytokines in activated keratinocytes. The study will also look at how *Sigesbeckiae Herba* affects oxidative stress markers like malondialdehyde (MDA), superoxide dismutase (SOD), catalase (CAT), and glutathione (GSH) levels, all in a way that depends on the concentration. Ultimately, the study seeks to investigate the potential of *Sigesbeckiae Herba* as a natural therapeutic agent for the treatment of plaque psoriasis, highlighting its promising antioxidant properties and terpenoid-rich composition. This study seeks to offer fundamental insights that may facilitate subsequent in vitro and in vivo research of *Sigesbeckiae Herba* concerning psoriasis treatment.

RESULTS

METHODOLOGY

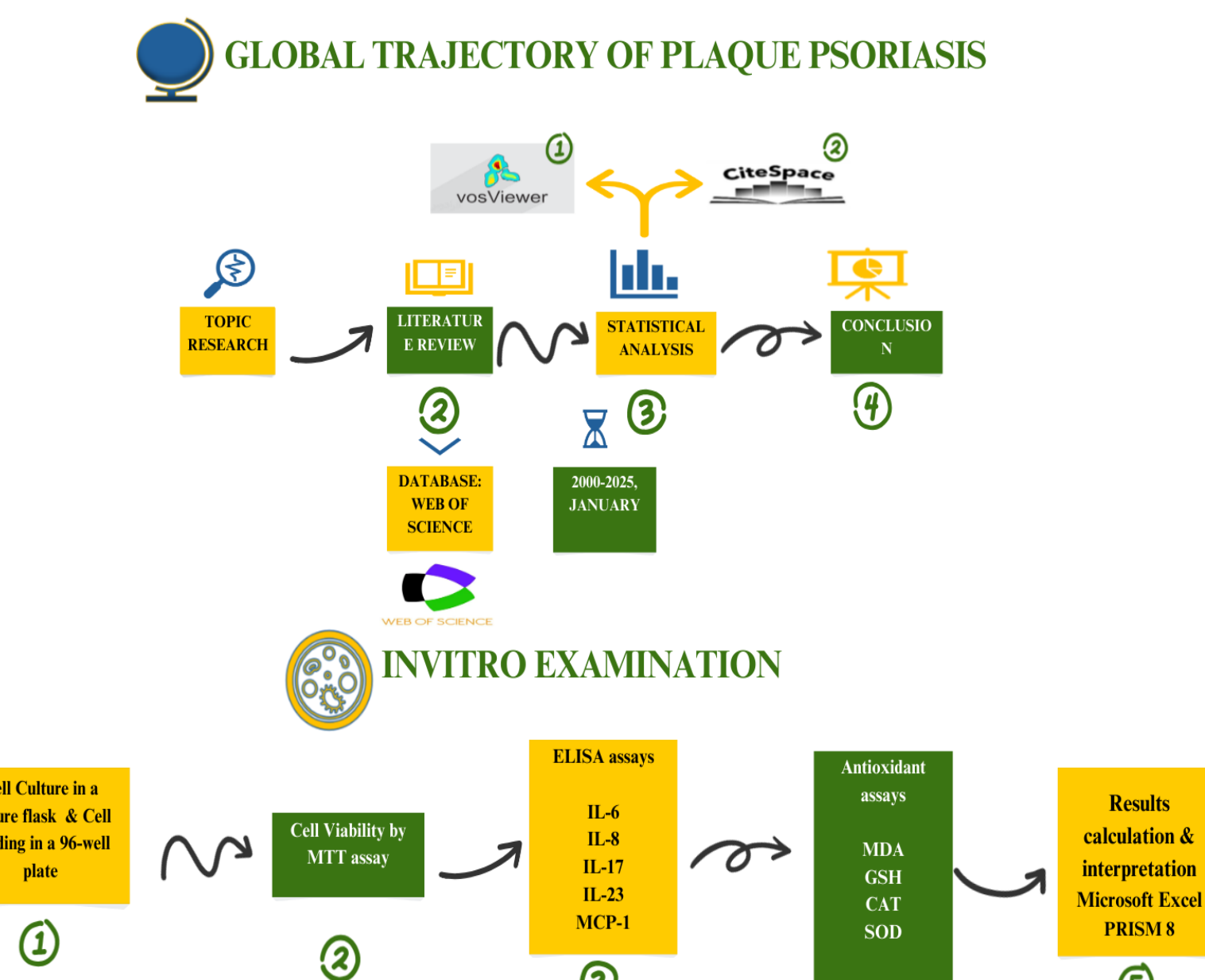


Figure 1 Methodology shows stepwise process of Scientometric review and In vitro studies

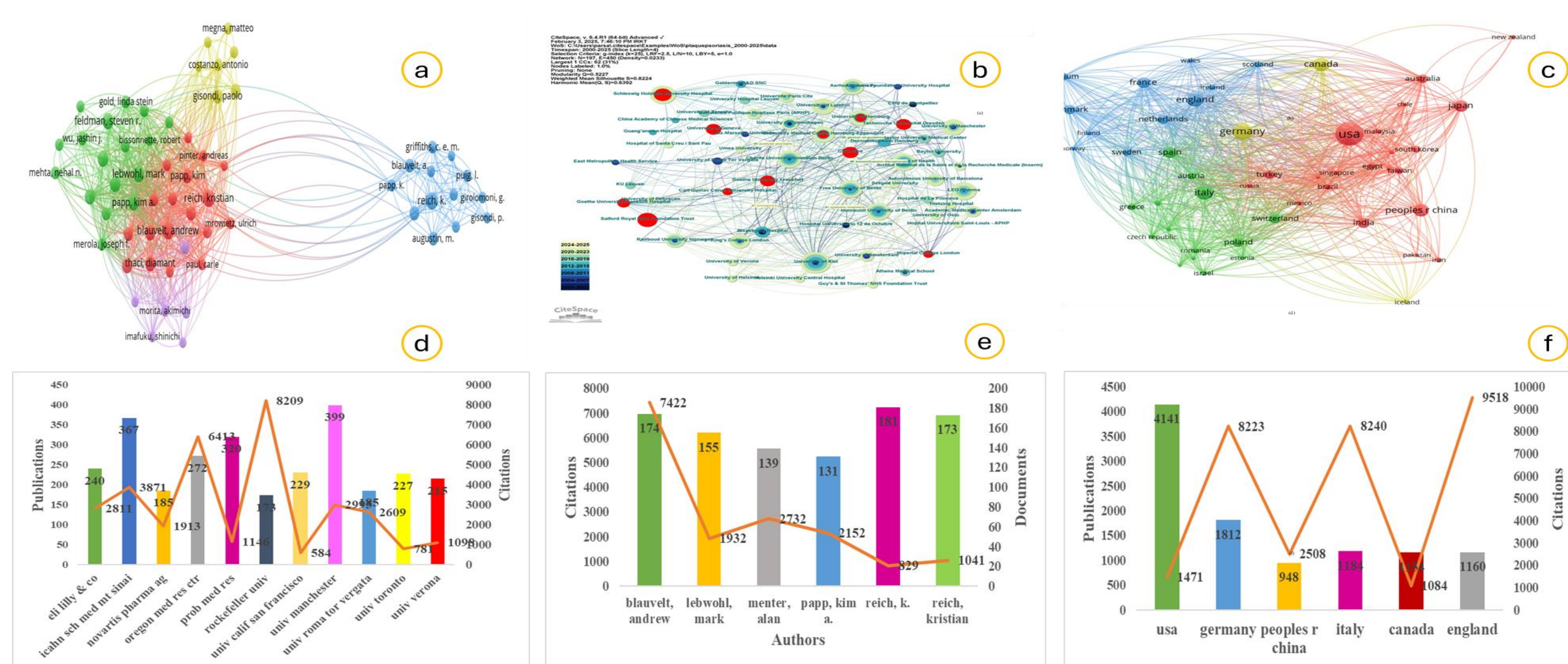


Figure 3 (a) Network of co-authorship-author analysis. (b) Top 6 authors with citations (<1000). (c) Network of Co-authorship-organisation analysis of 115 universities (d) Top 11 countries with more than 150 publications and high citations. (e) network of co-authorship-countries analysis of 49 countries (f) Combo plot shows Co-authorship-countries analysis with the most publications and citations.

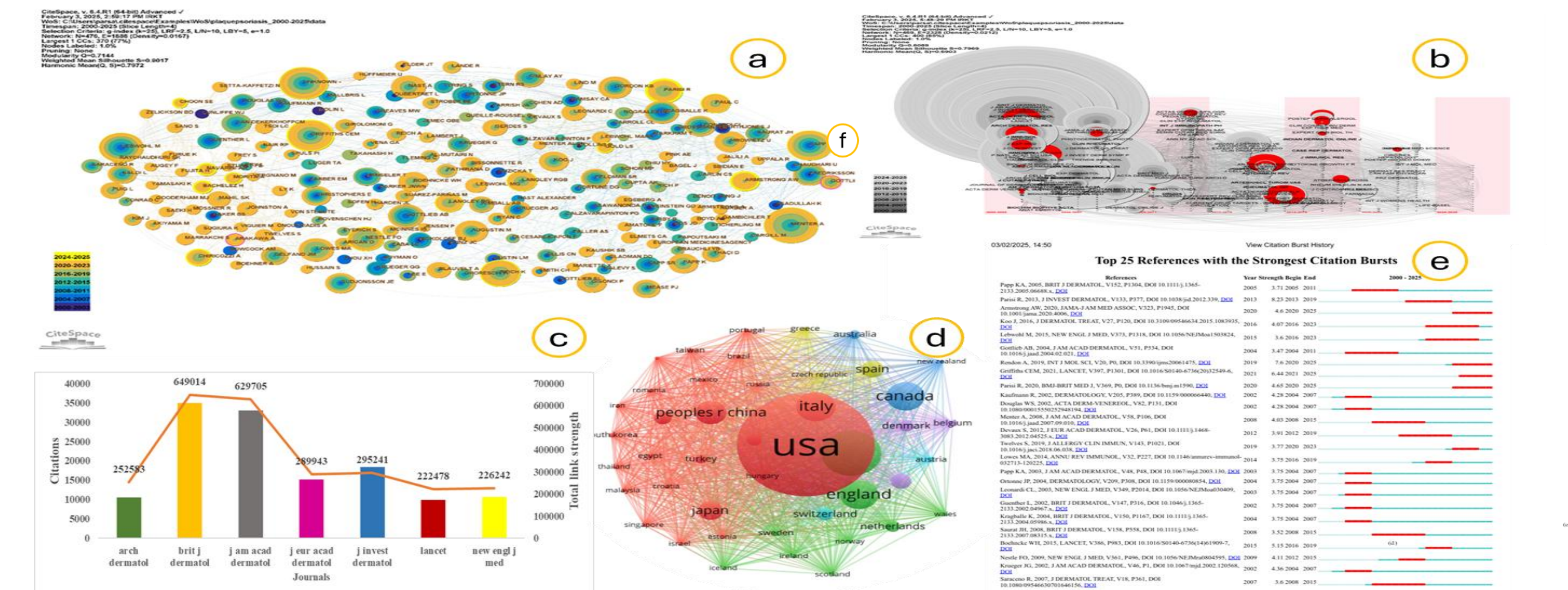


Figure 4 (a) Network map of author-co-citation analysis. (b) Timeline chart for journals with burst co-citations in red colour circles. (c) Combo graph showing Journal with high number of citations and link strength. (d) Bibliometric coupling of 44 countries. (e) References with strongest burst citation.

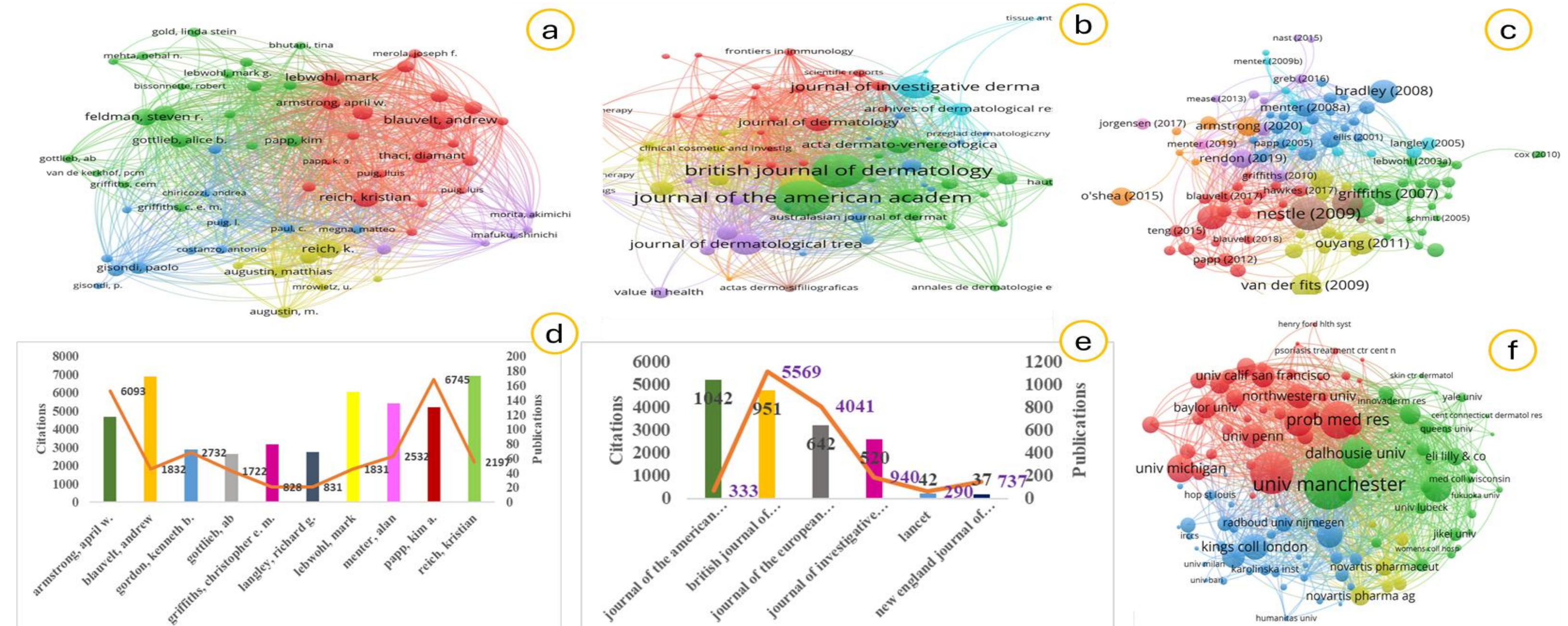


Figure 5 (a) Network of authors with a high number of citations. (b) Top 10 authors with a high number of citations. (c) Network of 74 journals with the higher number of citations. (d) Journals with publications on psoriasis vulgaris with higher no. of citations. (e) Network of 114 articles cited <300times. (f) Network of 115 organizations with a minimum of 50 articles and more than 100 citations.

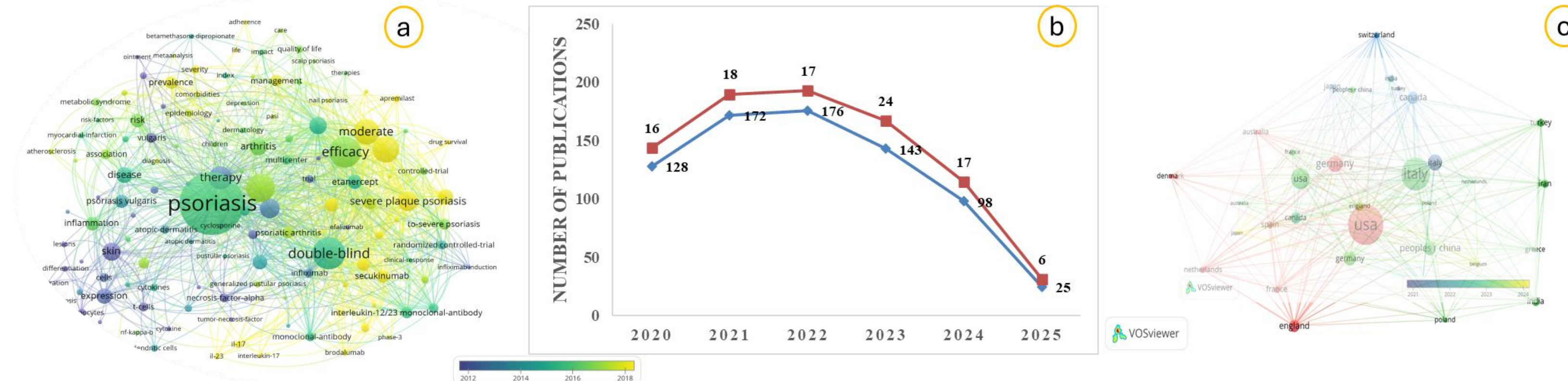


Figure 6 (a) timeline network of keywords (b) shows a surge in publication on psoriasis in Covid_19 (c) Overlay of Citation analysis of countries on publishing papers on psoriasis and particularly on plaque psoriasis during covid_19.

PRELIMINARY IN VITRO EXPERIMENT RESULTS OF TRI-SPEICES

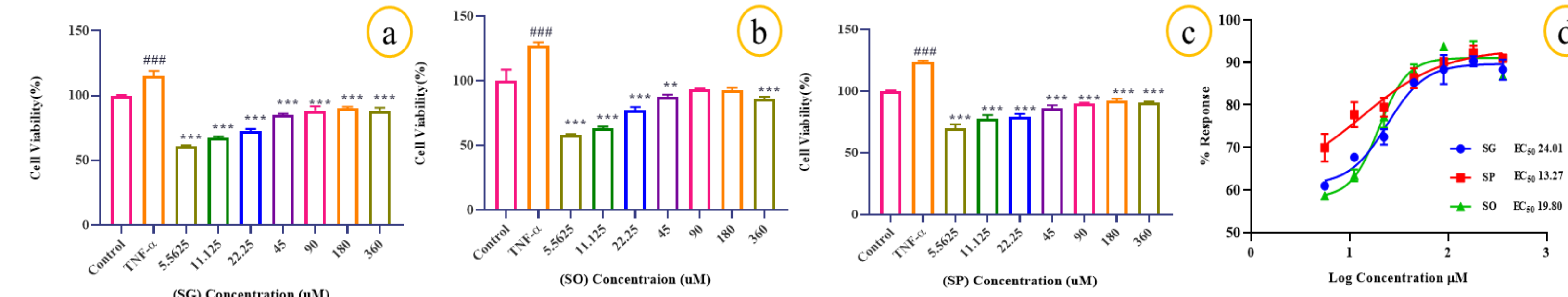


Figure 7 SH extracts rescued cytotoxicity in TNF- α treated HaCaT cells. Cells were incubated with each extract solution (5.5625-360 μ g/mL) and TNF- α (10 ng/mL) for 6 h. At the end of treatment, the cell viability was measured by MTT assay. The average cell viability of 3 extracts of *Sigesbeckia glabrescens* (SG), *Sigesbeckia orientalis* (SO) and *Sigesbeckia Pubescens* (SP) (A) 50% hydro-ethanolic extract of SO (B) 50% hydro-ethanolic SG extract (C) 50% hydro-ethanolic extract of SP was calculated. The 30% effective concentration (EC₅₀) of increased cell viability (D) was calculated using GraphPad Prism 8 software. Data are presented as the mean $\pm$ S.D. (n=3). ###P<0.001 vs Ctrl. Group. **P<0.01, ***P<0.001vs TNF- α group.

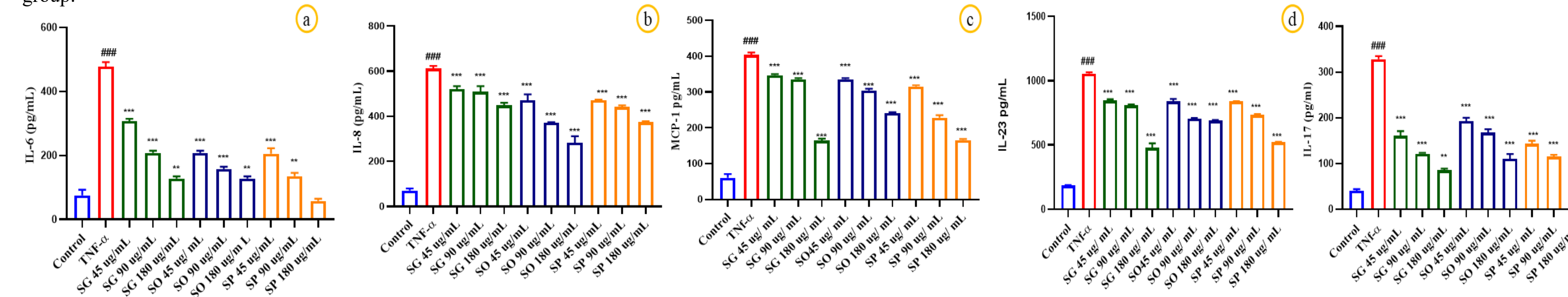


Figure 8 SH extracts reduced the secretion of cytokines induced by TNF- α in HaCaT cells. Cells were incubated with each extract at the concentration of 45, 90, 180 μ g/mL and TNF- α (10 ng/mL) for 6 h. Detection of IL-6, IL-8, IL-17, IL-23 and MCP-1 in culture supernatants with ELISA kits. Average values of (a), IL-6 (b) IL-8, (c) MCP-1, (d) IL-23 and (e) IL-17. SP proved to be effectively reduced inflammation induced by TNF- α in all three species. ###P<0.001 vs. the Ctrl group. *P<0.05, **P<0.01, *P<0.001 vs. the TNF- α group.

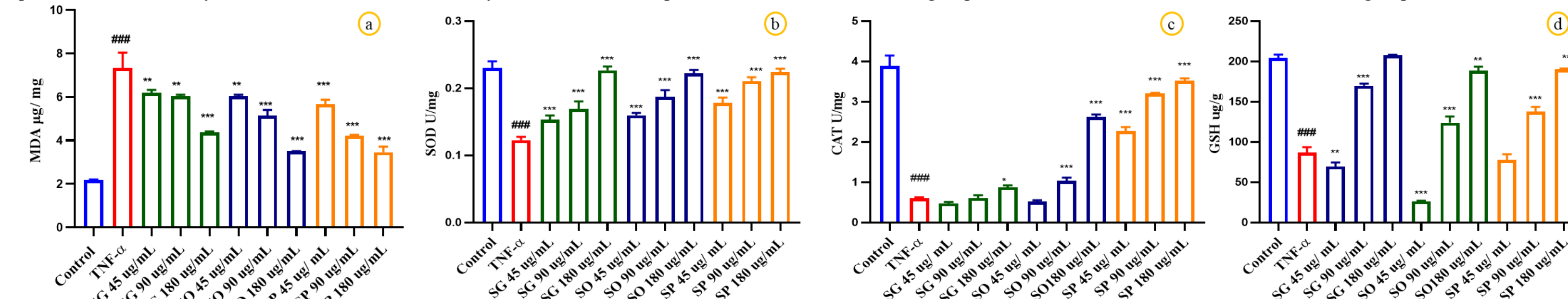


Figure 9 *Sigesbeckiae Herba* 50 % ethanolic extract inhibited the oxidative stress in TNF- α -stimulated HaCaT cells. Kirenel decreased the level of (a) MDA but increased the levels of (b) SOD, (c) CAT, and (d) GSH in a dose-dependent manner. ###P<0.001 vs. control. *P<0.05 vs. TNF- α alone, **P<0.01 vs. TNF- α alone, and ***P<0.001 vs. TNF- α . TNF- α : tumor necrosis factor- α ; MDA: malondialdehyde; SOD: superoxide dismutase; CAT: catalase; GSH: glutathione.

CONCLUSION

By promoting the use of safe, plant-based therapies like *Sigesbeckiae Herba*, this research contributes to SDG 3 by supporting accessible, integrative, and sustainable healthcare solutions for chronic inflammatory diseases.

ACKNOWLEDGMENT

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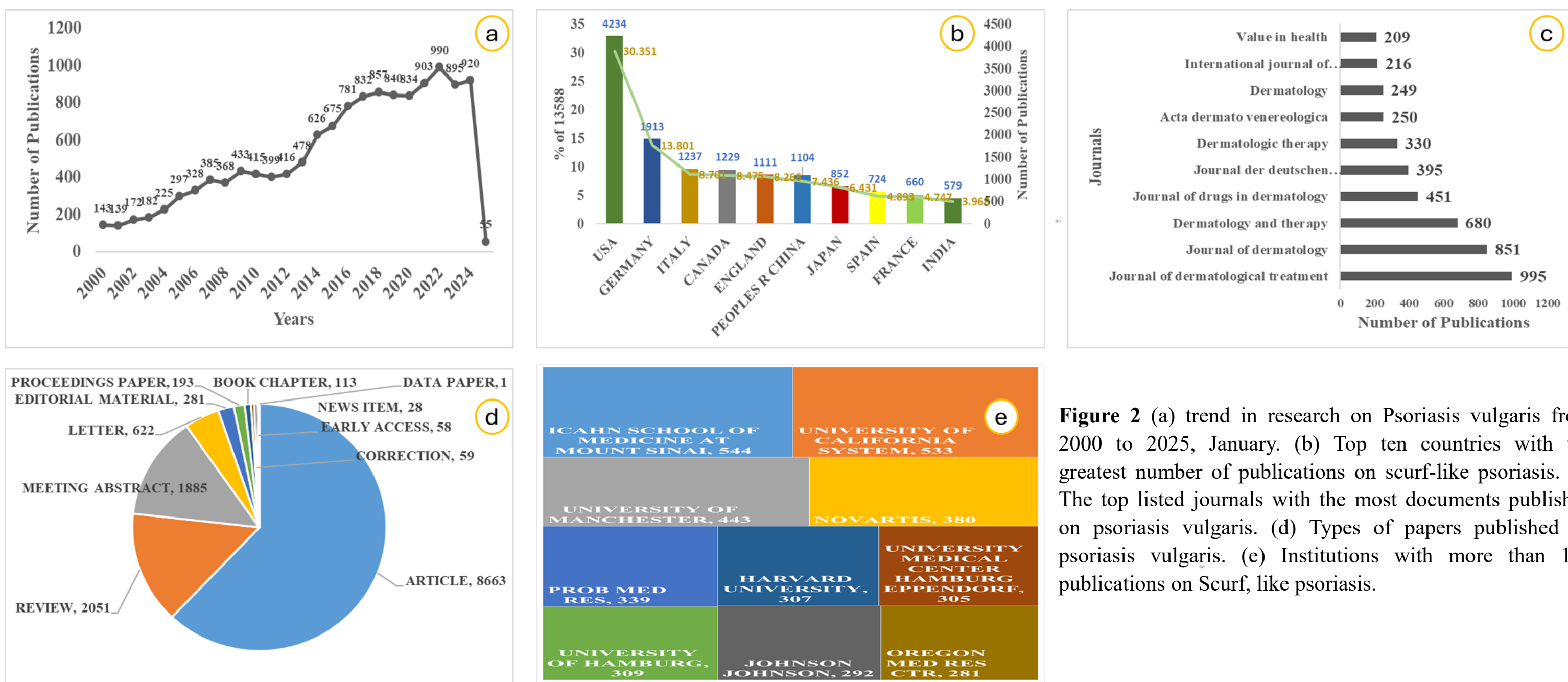


Figure 2 (a) trend in research on Psoriasis vulgaris from 2000 to 2025, January. (b) Top ten countries with the greatest number of publications on scurf-like psoriasis. (c) The top listed journals with the most documents published on psoriasis vulgaris. (d) Types of papers published on psoriasis vulgaris. (e) Institutions with more than 100 publications on Scurf, like psoriasis.