Research Trends, Collaborations, and Impact of *Curcuma sp.* as a Colorectal Cancer Drug: A Bibliometric Review (2003-2023)

Indah Sulistyarini[1], *Agung Endro* Nugroho[2*], *Sisca* Ucche[2], *Firmansyah*[1], *Desy Ayu Irma* Permatasari[1], *Feti* Rahmawati[1], *Juliyanty* Akuba[1], *Ahmad* Marzuki[1], *Nur* Ismiyati[1], *Ana* Mardiyaningsih[1]

[1]Doctoral Program, Faculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta, Indonesia.
[2]Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta, Indonesia

Abstract. Colorectal cancer ranks as the third most prevalent cancer, was the second most common cause of cancer-related deaths globally. Nowadays, plenty of papers are published about Curcuma sp. as colorectal cancer; however, no bibliometric study about the topic exists. This study examines the existing papers about Curcuma sp. as colorectal cancer agent using bibliometric analysis focusing on countries, institutions, publishers, authors, documents, and keywords. Bibliographic information of relevant research articles were obtained from the Scopus database. This research presents a detailed bibliometric analysis of scientific publications from 2003 to 2023. In total, 121 documents from 95 journals, it was found that production has grown steadily, with an annual growth rate of 5.65%. The average number of citations per document is 65.02, indicating a significant impact on the scientific community. This analysis highlights the most productive authors, the most frequently cited papers, and the key geographic regions that drive scientific output. This study explains the role of Curcuma sp. in the fight against colorectal cancer. It includes descriptions of molecular mechanisms, pre-clinical testing, clinical trials, and the effectiveness of alternative therapies. The study highlights the ongoing significance of this topic over time, illustrating the transition from basic research to clinical applications.
Keyword: *Curcuma sp*., Colorectal Cancer, Trends, VOSviewer, Rstudio

1 Introduction

Colorectal cancer (CRC) ranks as the third most prevalent cancer and the second leading cause of cancer-related deaths globally, responsible for nearly 900,000 deaths annually [1]. While it was once infrequently diagnosed, CRC is now increasingly common due to lifestyle-related factors such as obesity, physical inactivity, and smoking—especially in high-income countries with elderly populations. The incidence is higher in men, although women experience about 25% lower rates of both incidence and mortality. Geographic variation remains significant, with developed countries reporting the highest rates. Global cases are projected to reach 2.5 million by 2035 [2].

Although turmeric (Curcuma longa; an Indian spice) has been described in Ayurveda, as a treatment for inflammatory diseases and is referred by different names in different cultures, the active principle called curcumin or diferuloylmethane, a yellow pigment present in turmeric (curry powder) has been shown to exhibit numerous activities. Extensive research over the last half century has revealed several important functions of curcumin. It binds to a variety of proteins and inhibits the activity of various kinases. By modulating the activation of various transcription factors, curcumin regulates the expression of inflammatory enzymes, cytokines, adhesion molecules, and cell survival proteins. Curcumin also downregulates cyclin D1, cyclin E and MDM2; and upregulates p21, p27, and p53. Various preclinical cell culture and animal studies suggest that curcumin has potential as an antiproliferative, anti-invasive, and antiangiogenic agent; as a mediator of chemoresistance and radioresistance; as a chemopreventive agent; and as a therapeutic agent in wound healing, diabetes, Alzheimer disease, Parkinson disease, cardiovascular disease, pulmonary disease, and arthritis. Pilot phase I clinical trials have shown curcumin to be safe even when consumed at a daily dose of 12 g for 3 months. Other clinical trials suggest a potential therapeutic role for curcumin in diseases such as familial adenomatous polyposis, inflammatory bowel disease, ulcerative colitis, colon cancer, pancreatic cancer, hypercholesteremia, atherosclerosis, pancreatitis, psoriasis, chronic anterior uveitis and arthritis. Thus, curcumin, a spice once relegated to the kitchen shelf, has moved into the clinic and may prove to be ‘‘Curecumin’’ based on the Goel (2008) research. Both hereditary and environmental factors contribute to the development of CRC, with 10–20% of patients having a family history and heritability estimated to be between 12% and 35% reported by Henrikson et al., 2015. Furthermore, gene polymorphisms are implicated in 5–7% of hereditary colorectal cancer cases reported by Syngal et al., 2015. These statistics underscore the growing global burden of colorectal cancer and highlight the urgent need for preventive strategies and early detection, particularly in populations at genetic or lifestyle-related risk.

* Corresponding author: nugroho_ae@ugm.ac.id

© The Authors, published by EDP Sciences. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).

Certain plant-derived compounds, such as taxol from Taxus brevifolia and camptothecin from Camptotheca acuminata, have demonstrated potent anticancer properties and have served as the basis for clinically approved chemotherapeutic agents. Similarly, curcumin (1,7-bis(4-hydroxy-3-methoxyphenyl)-1,6-heptadien-3,5-dione), the major bioactive compound in turmeric (Curcuma longa L.), exhibits diverse biological activities, including antioxidant, anti-inflammatory, anticancer, antiviral, hypolipidemic, and anti-infective effects, both in vitro and in vivo. Like taxol and camptothecin, curcumin represents another promising phytochemical with anticancer potential, supporting its exploration as a complementary or alternative therapeutic agent in oncology.

Numerous studies indicate that curcumin effectively promotes apoptosis in various cancer cell lines, such as HL-60 (acute promyelocytic leukaemia), MCF-7 (estrogen receptor-positive breast cancer), HeLa (cervical cancer), and HT-29 (colorectal adenocarcinoma) [3]. It also shows antioxidant capabilities by inhibiting Jun N-terminal kinases (JNK) activation and the release of mitochondrial cytochrome c in several cancer cell line, a research by Duvoix et al., 2005. Furthermore, research has shown that curcumin reduces N-acetyltransferase activity and gene expression in human colon cancer cells, specifically COLO 205, a research by Su Chin Chen (2006). This suggests that curcumin may influence carcinogen metabolism and gene regulation pathways involved in colorectal cancer progression, highlighting its potential as a chemopreventive agent.

Scientific research drives advancements in technology and medicine, with publication volume serving as an indicator of innovation in a given field. Over the past two decades, there has been a notable increase in scientific output, particularly in drug discovery and development, which often involves in vitro and in vivo pharmacological studies. Research on natural medicines has focused on their extracts, fractions, and isolates [4]. Analyzing trends, collaborations, and the impact of these publications through bibliometric analysis can provide insights into the direction of scientific progress and help identify promising areas for further research in *Curcuma sp.* on colorectal cancer treatment. To the best of our knowledge, there has been no published bibliometric analysis paper on the *Curcuma sp.* effect for treatment of colorectal cancer.

This study conducts a bibliometric analysis of 121 scientific articles published from 2003 to 2023. It examines growth rates of publications, collaboration between authors, citation metrics, and thematic trends, particularly focusing on international collaboration and the geographic spread of scientific output. The research aims to elucidate the key factors influencing scientific production in this timeline and to underscore the most significant research topics and leading authors.

2 Methodology

2.1 Data source

Data on *Curcuma sp*. as an anti-colorectal cancer agent was sourced from the Scopus database due to its extensive coverage of scientific literature [6]. We searched the Scopus database for articles containing the keywords: “Curcuma” AND “Colorectal cancer” OR “colon cancer”. The scientific literature reviewed must include these keywords or similar terms in the title, abstract, or keywords section. Full texts that meet our established inclusion and exclusion criteria will undergo further analysis [5]. The inclusion criteria consist of literature sourced from the Scopus database, encompassing original articles published in English, with a timeframe from 2003 to 2023. Exclusions from scientific literature involve irrelevant terms related to cancers other than colorectal cancer and references to herbal plants excluding *Curcuma sp.*, along with biased information, non-full-text articles, and duplicate publications.

2.2 Data extraction and analysis

Data extraction and analysis, including the inclusion and exclusion criteria used in this study, are outlined in Table 1. Literature from the database that meets the requirements is collected and saved as a "CSV" file, then visualized using Vosviewer v.1.6.20 and and R-Studio v.2024.12.0+467 for the analysis process. The visualization results are analyzed further for bibliometric studies [7]. The following parameters were evaluated to determine the outcomes of this bibliometric study: publication trends, contributing countries and institutions, analysis of contributing publishers/journals, the most prolific authors and their bibliographic

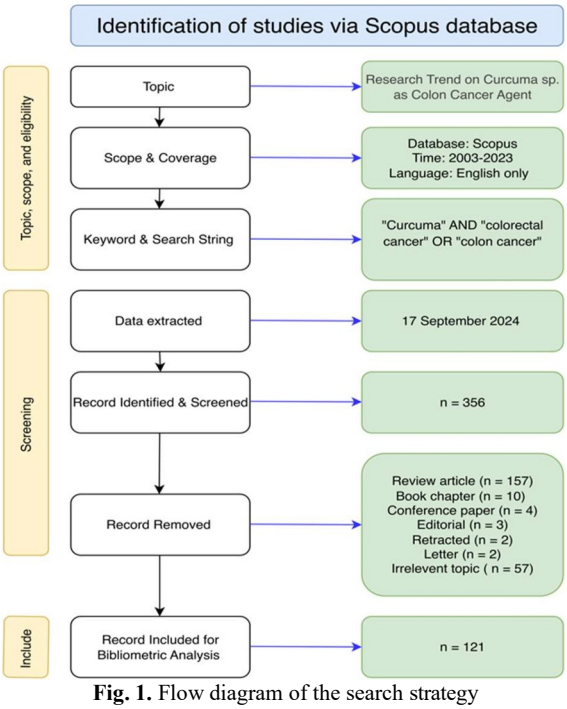

Fig. 1. Flow diagram of the search strategy

coupling networks, analysis of the most influential papers, and the impact of the articles.

2.3 Term mapping on VOSviewer

VOSviewer software extracts and analyzes words found in the titles, abstracts, and keywords of relevant articles. The analysis results are displayed as a node map, illustrating individual terms or phrases as described by Yeung et al, 2018. A manual review was conducted to remove any irrelevant terms. The size of each node reflects the frequency of words in the literature. Node color represents the citation count of each publication containing the term, while the proximity of two nodes indicates how often the terms co-occur.

3 Results and Discussion

Data collection and filtering based on the flow diagram provide an overview of research publication trends related to *Curcuma sp.* as a colorectal cancer therapeutic agent. The search process using the Scopus database with the specific keywords *"Curcuma sp.*" "colorectal cancer, " and "colon cancer" resulted in 356 articles, indicating significant attention to this topic within the scientific community. However, a thorough screening process led to the exclusion of many articles that did not meet specific criteria. Of these, 178 articles were discarded because their publication dates fell outside the 2003–2023 range or because they were not original papers (e.g., reviews or editorials). Thus, we removed 2 articles for not published in English. Additional filtering eliminated 57 articles that did not specifically address the connection between *Curcuma sp.* and colorectal cancer. Ultimately, only 121 articles remained relevant and suitable for further analysis. In this article, we only used from Scopus database. In contrast, Google Scholar was not utilized, as it lacks the detailed information necessary for network analysis, particularly in bibliometric studies [6].

This analysis reveals that approximately 30% of articles meet the research criteria for relevance and quality. This filtering indicates that many studies in the literature are either general or not directly aligned with the research's main focus. The publication timeframe (2003–2023) suggests a growing interest in this topic over the past two decades, likely due to advancements in the bioactive potential of *Curcuma sp.* for cancer treatment. The research primarily involved original studies, highlighting that advancements in this field depend on the findings of direct experimental research rather than existing literature or secondary reviews.

The publication trend suggests significant potential for further investigation of *Curcuma sp.* in colorectal cancer treatment. In contrast, the strict selection process emphasizes the necessity of ensuring quality and relevance in research within this domain, highlighting the importance of concentrating on studies that directly contribute to therapeutic applications' development.

Over the past two decades (2003–2023), research into the application of *Curcuma sp.* as a therapy for colorectal cancer has surged, evident in both the increased publication volume and the range of research topics. Initially, around 2003, investigations primarily aimed to explore the bioactive potential of curcumin, the key component of *Curcuma sp.*, focusing on its antioxidant, anti-inflammatory, and anticancer properties. Early studies employed in vitro models to examine molecular mechanisms, including the inhibition of the NF-κB and COX-2 pathways and the induction of apoptosis through the mitochondrial pathway [8].

In pharmacological aspects, *Curcuma sp* has several mechanisms to exhibit colorectal cancer. Curcumin as a major compound in *Curcuma sp* induces apoptosis in colon cancer Colo 205 cells primarily through a mitochondrial-dependent pathway involving several interconnected mechanisms as generation of Reactive Oxygen Species (ROS), elevation of intracellular Ca^{2+} levels which is crucial for apoptosis, disruption of Mitochondrial Membrane Potential (MMP). Curcumin upregulates pro-apoptotic proteins like Bax and Chk2, and downregulates anti-apoptotic Bcl-2 and p53, shifting the balance toward cell death. Collectively, these pathways underscore that curcumin triggers apoptosis via mitochondrial dysfunction driven by increased ROS and Ca^{2+}, leading to caspase activation and programmed cell death in colorectal cancer as described by Su Chin Cheng (2006). Additionally, curcumin inhibits the growth of HT29 cells (colorectal cancer) by modulating the epigenetics of the DLEC1 gene, a tumor suppressor gene by reducing CpG methylation in the DLEC1 promoter and increasing DLEC1 mRNA expression as result by Guo (2015) research [9].

In the 2010s (from 2013 onwards), research was increasingly emphasizing translational methods and clinical applications. The priority is shifting from laboratory testing alone to preclinical evaluations and clinical trials. Researchers have focused on validating the effects of curcumin in patients with colorectal cancer. Additionally, efforts are being made to enhance curcumin's bioavailability, as its low absorption often limits its effectiveness in clinical therapy. New strategies, including nanoparticle formulations, liposomes [10], and phospholipid complexes [11], have been developed to address this issue.

In addition, research over the past two decades has expanded its scope to interdisciplinary areas, including studies on how curcumin modulates gut microbiota to reduce chronic intestinal inflammation [12], a risk factor for colorectal cancer. The study also examined the epigenetic effects of curcumin, such as the restoration of tumor suppressor genes through histone modification or the inhibition of DNA methylation as stated in research by Guo (2015).

Table 1. Development of *Curcuma sp*. research publications for Colorectal Cancer over a 3-year period

No	Year range	Documents	Citations	h-index	Average publication/year	Average citation/year
1	2023-2021	32	349	170	10.6	56.6
2	2020-2018	20	759	12	6.6	40.3
3	2017-2015	19	823	134	6.3	44.6
4	2014-2012	17	661	100	5.6	33.3
5	2011-2009	13	883	78	4.3	26.0
6	2008-2006	15	3,795	86	5.0	28.6
7	2005-2003	5	597	22	1.6	7.30

Table 2. Global Citation Count on Various Research of *Curcuma sp.*

Paper	DOI	Total Citations	TC per Year
Goel A., 2008, Biochemical Pharmacology	10.1016/j.bcp.2007.08.016	1921	113.00
Kurien B.T., 2007, Assay and Drug Development Technologies	10.1089/adt.2007.064	296	16.44
Chen A., 2006, Oncogene	10.1038/sj.onc.1209019	276	14.53
Jeong W.S., 2004, Pharmaceutical Research	10.1023/B:PHAM.0000022413.43212.cf	251	11.95
Milacic V., 2008, Cancer Research	10.1158/0008-5472.CAN-07-6246	238	14.00
Kunnumakkara A.B., 2008, Clinical Cancer Research	10.1158/1078-0432.CCR-07-4722	206	12.12
Su Chin Cheng, 2006, Anticancer Research	N/A	186	9.79
Mcfadden, Rita M.T., 2015, Inflammatory Bowel Disease	10.1097/MIB.0000000000000522	175	17.50
Basile V, 2009, Biochem Pharmacol	10.1016/j.bcp.2009.06.105	172	10.75
Johnson S.M., 2009, Anticancer Research	N/A	155	9.69

Overall, research over the last two decades (2003–2023), shows a shift from basic exploration to the clinical application and integration of modern pharmaceutical technologies. However, despite an increase in research efforts, challenges persist regarding bioavailability, effective dosages, and long-term clinical implementation. Several studies has been discussed about significant therapeutic promise of *Curcuma sp.* especially in oncology; yet, its clinical utilization is impeded by low bioavailability, fast disintegration, and inadequate solubility. Studies have shown that curcumin serum levels only reach about 60 nM after oral administration, far below the concentration needed to exert significant therapeutic effects .

Various strategies have been attempted to overcome this issue, one of which is the development of curcumin analogs, such as bis-DemethoxyCurcumin (bDMC) and diAcetylCurcumin (DAC), which are more stable than curcumin in physiological media. These analogs not only improve stability but also enhance pharmacological activity by targeting molecular pathways involved in cancer cell growth and apoptosis [13]. Although these modifications enhance curcumin's stability, it continues to decrease substantially over time, restricting its long-term application in clinical environments. Consequently, future research trends are likely to focus more on extensive clinical trials, innovative formulation strategies, and combination therapy with other anticancer agents.

3.1 Periodic growth of literature on *Curcuma sp.* A 7-year periodic growth of *Curcuma sp.* publications retrieved from the Scopus database 2003-2023 (n = 121)

The research development regarding *Curcuma sp.* as a colorectal cancer treatment over seven time periods (2003–2023) illustrates a dynamic and advancing trend, it can be seen in table 1. During the initial phase (2003–2005), the publication count was low, with just 5 articles, yet the average citations per article were notably high (597 total citations, averaging 7.3 annually). This indicates the considerable impact of early research despite the limited volume of papers. The period from 2006–2008 marked a crucial turning point with a significant increase in citations (3,795) and a rise in articles to 15, highlighting the emergence of foundational studies that became key references for later research. However, in the 2009–2011 period, while the number of articles slightly declined to 13, the influence remained strong, reflected by a total of 883 citations and an annual average of 26, showcasing the sustained quality of the research despite the drop in publications numbers.

Based on table 1, between 2012 and 2014, the number of published articles arising to 17, achieving a total of 661 citations and an annual average of 33.3 (This data was imported from biblioshiny on R Studio v.2024.12.0+467). This indicates a steady level of research productivity, though the citation impact was not as robust as in the previous period. The following years, from 2015 to 2017, further reflected this positive trend, with 19 articles and total citations reaching 823, elevating the annual average to 44.6. Research during this time emphasized innovative curcumin formulations and specific therapeutic strategies, leading to notable impacts. In the final period from 2018 to 2020, the article count increased to 20, accumulating 759 citations, and an annual average of 40.3, signaling a new focus on translational research and practical applications.

From 2021 to 2023, there was a peak in publications, totaling 32 articles, which shows an increasing interest in this area of research. While the citation count is comparatively lower at 349 total citations (averaging 56.6 citations per year), this is understandable as these articles are still relatively new and require time to attract more academic attention. Overall, these trends illustrate

a substantial shift from preliminary exploratory research to clinical applications and innovative formulations, highlighting the growing interest in *Curcuma sp.* as a potential therapeutic agent for colorectal cancer over the past 20 years.

Table 2 illustrates the global citation counts for various research papers on *Curcuma sp*. in colorectal cancer treatment, arranged by citation frequency. The study by Goel A. (2008), published in Biochemical Pharmacology, ranks first with an impressive 1,921 citations, highlighting its significant influence and establishing it as a key reference in this area. This research presumably serves as a foundational study, linking clinical and biochemical aspects of curcumin.

In second place, research conducted by Kurien B.T. published in Assay and Drug Development Technologies received 296 citations, highlighting significant interest in methods to enhance the pharmacological efficacy of curcumin through heat treatment. Additionally, Chen A.'s research (2006), which garnered 276 citations in Oncogene, made a notable contribution to understanding the molecular mechanisms of curcumin, particularly its role in inhibiting growth factors in colon cancer cells. Moreover, studies by Jeong W.S., (2004) in Pharmaceutical Research and Milacic V., (2008) in Cancer Research, which received 251 and 238 citations respectively, demonstrated significant advancements in the development of curcumin-based chemopreventive agents.

Recent findings demonstrate that curcumin modulates gut microbiota and associated metabolites, which play a pivotal role in regulating growth factors and the proliferation of colorectal cancer cells. This study further reveals that curcumin exerts antitumorigenic effects through metabolic and immunological pathways, highlighting its potential as a multi-targeted therapeutic agent in colorectal cancer management [14]. Furthermore, the research focusing on how curcumin exhibits chemopreventive effects by modulating multiple molecular targets involved in cancer initiation, promotion, and progression [15].

Other studies, such as Kunnumakkara A.B., (2008) work published in Clinical Cancer Research (206 citations), focused on how curcumin enhances cancer therapy when combined with radiation. In addition, research by Su et al., (2006) and McFadden et al., Rita M.T., (2015) showcased the role of curcumin in cancer cell apoptosis and the effects of gut microbiota. While Basile V., (2009) and Johnson S.M. (2009) had fewer citations (172 and 155, respectively), their work significantly advanced the understanding of curcumin derivatives and their effects on molecular pathways in cancer.

In summary, Table 2 indicates that most highly cited studies introduce new insights into curcumin's mechanisms of action and pharmacological methods, significantly contributing to the advancement of therapies based on *Curcuma sp.* The higher the citation count, the more influential the research is within the academic community, fostering further developments in the field.

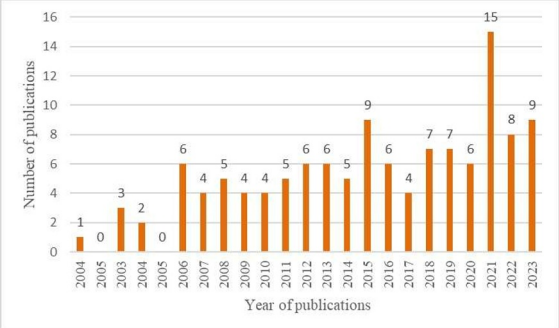

Fig 1. Annual Scientific Production

The bibliometric chart from Fig. 1 illustrates the publication trend from 2004 to 2023, showing a clear fluctuation in research activity over the years. In the early years (2004-2009), there was relatively low publication activity, with some years, like 2004 and 2007, showing no publications at all. This suggests that the research area may have been in its nascent stages or faced limitations in funding or resources. Starting from 2010, there was a moderate increase in the number of publications, fluctuating between 4 and 9 publications per year. However, the most notable surge occurred in 2020, with a significant peak in 2021(15 publications), noting the highest point in the graph. Interestingly, the number of publications remained high through 2023, indicating sustained research activity in this area.

From 2003 to 2023, a total of 121 scientific articles were published, showing an overall annual growth rate of 5.65%. Notably, the number of publications rose sharply in the latter half of this timeframe, peaking in 2021 with 15 articles, followed by 8 articles in 2022 and 9 articles in 2023. Moreover, there was a significant increase of total citation in 2008, with a total of 2,564 citations contributed by the article authored by Goel A. in 2008, titled *Curcumin as "Curecumin": From Kitchen to Clinic*. This indicates that articles with captivating titles and engaging discussions can significantly boost citation counts. This particular article explores the chemical compounds found in curcumin, which may have biological effects in medical treatments. This trend illustrates a significant increase in scientific activity in recent years, likely fueled by advancements in research technology, more funding, and a heightened focus on interdisciplinary collaboration. This consistent growth reflects a growing interest in the subjects covered by these publications, as evidenced by the citation data.

3.2 Analysis of publication sources

The most productive journal sources was *Nutrition And Cancer* (the total number of publications = 4, the total number of citations = 227; AC = 56.75), followed by *Anticancer Research* with the most citation over another journal mentioned above (the total number of publications = 3, the total number of citations = 2,195; AC = 731.66) as depicted in Table 3. Information about the publishers that produce on *Curcuma* sp. as anti cancer agent will help scholars pursue a particular

Table 3. The Most Productive Sources of *Curcuma sp.* From Scopus Database 2003-2023.

No	Journal	TP	TC	AC per publication
1	Nutrition And Cancer	4	227	56.75
2	American Journal Of Chinese Medicine	3	463	154.33
3	Anticancer Research	3	2,195	731.66
4	Biochemical Pharmacology	3	43	14.33
5	Frontiers In Oncology	3	101	33.66
6	Frontiers In Pharmacology	3	189	63.00
7	Journal Of Agricultural And Food Chemistry	3	40	13.33
8	Molecules	3	34	11.33
9	Asian Pacific Journal Of Cancer Prevention	2	27	9.00
10	Bioorganic And Medicinal Chemistry	2	85	42.50

publisher and submit their report of research related to this topic.

3.3 Analysis of the Contributions of the 20 Best Authors in *Curcuma sp.* Research on Colon Cancer

Studies on *Curcuma sp.* and its impact on colon cancer have attracted worldwide interest due to its considerable pharmacological effectiveness. Curcumin's ability to induce apoptosis in colorectal cancer cells through various molecular mechanisms, including ROS production, Ca^{2+} influx, and mitochondrial malfunction, establishes it as an effective therapeutic agent against colorectal cancer. As study by Su Chin Cheng (2006), curcumin, as a natural and potentially economical molecule, may assist in alleviating the increasing worldwide cancer burden, especially in resource-limited environments where access to expensive treatments is restricted.

Bibliometric analysis can assess researchers' contributions by measuring the impact of their published articles. The analysis indicates that there are 20 authors with the most significant contributions in the subject. Table 4 showed that there are 20 authors with the highest contribution in this research field. Several studies have focused on developing curcumin pharmacology, phytochemical applications, and molecular mechanisms related to colon cancer. The following is data related to the Contribution Analysis of the most Influential Papers from the 20 Best Writers in *Curcuma sp.* Research on Colon Cancer as depicted in Table 4. According to Table 4 the relationship between citation counts and Link Strength (LS) plays a distinct role in bibliometric analysis. Citation counts indicate how significantly an article impacts the scientific community, whereas LS measures how strongly an article connects with other documents within a specific research network, such as through co-citation or author collaboration. For instance, Goel, Ajay (2008) has the highest citation count (1921) but a low LS (1), highlighting its broad relevance across various fields, particularly in clinical and pharmaceutical contexts. Conversely, Kunnumakkara, Ajaikumar B. (2008) demonstrates high LS (5) with fewer citations (206), suggesting its pivotal role in focused subthemes, such as the molecular mechanisms of curcumin. This suggests that articles with elevated LS are often more closely associated with similar research within a particular network, even when they lack high citation counts.

Therefore, analyzing citation numbers alongside LS offers complementary insights: articles with numerous citations serve as valuable references for general influence, while those with high LS are more pertinent for in-depth investigation of specific subthemes. The analysis of the most influential papers (Table 4) identifies 20 authors as key contributors in this field. Many studies focus on enhancing curcumin's pharmacology, examining phytochemical uses, and researching the molecular mechanisms linked to colon cancer. Based on the year of publication, a trend appears to be that research related to curcumin peaked between 2005–2010. Authors like Kunnumakkara, Ajaikumar B. and Su, Chin-Cheng dominate with frequently cited articles. The articles from Kunnumakkara, Ajaikumar B. (2008), and Su, Chin-Cheng (2006) dominate research on curcumin's effects on the mechanism of apoptosis of colon cancer cells and its pharmacokinetics. These authors' research focus covers key topics such as pharmacology, phytochemistry, and oncology, with contributions that strengthen the scientific foundation for the development of curcumin-based therapies. This study also revealed a significant upward trend in curcumin-related publications between 2005 and 2010, reflecting global attention to curcumin's potential as an anticancer agent.

The data reveals that citation trends and Link Strength (LS) are shaped not only by the name of the first author and the year of publication but also by the author's reputation, the research topic, and the relevance of the article at its time of release. For instance, the work by Goel, Ajay (2008), despite having a low LS (1), boasts the highest citation count (1921), indicating its significant influence in pharmaceutical and clinical fields, likely due to the popular topic of curcumin's potential applications in 2008. Conversely, Kunnumakkara, Ajaikumar B. (2008), while featuring a higher LS (5) with fewer citations (206), serves as a central piece in niche subthemes tied to curcumin's molecular mechanisms, showcasing a more specialized impact. Additionally, the timing of publication remains crucial; earlier articles, like those by Kirana, Chandra (2003), often accumulate citations over a longer span despite a low LS (2). In contrast, recent publications, such as Guo, Yue (2015), with lower citations (102) yet significant LS (1), may point to emerging topics or

insufficient time for citation growth.

Therefore, the first author's name, publication year, and journal relevance are vital for comprehending how the article resonates and integrates within the scientific community. An analysis of the contributing countries highlights the role of international collaboration. Collaboration across borders has increasingly become crucial in scientific research. This dataset reveals that 14.88% of papers include authors from multiple countries. China tops the list with 32 publications, while the United States follows with 19. Nevertheless, the US outperforms in citation impact, averaging 212.84 citations per article, highlighting the significant influence of its research.

Table 4. Analysis of the most Influential Papers of the 20 Best Authors in *Curcuma sp*. Research on Colon Cancer

Ranking	First author and year	Document title	Journal	Citations	LS*	Research focus
1	Kunnumakkara, Ajaikumar B., 2008	Curcumin sensitizes human colorectal cancer xenografts in nude mice to γ-radiation by targeting nuclear factor- κB-regulated gene products	Clinical Cancer Research	206	5	Phytochemistry, Anticancer, Pharmacology
2	Su, Chin-Cheng; Lin, Jaung-Geng; Li, Te-Mao; Chung, Jing-Gung; Yang, Jai-Sing; Ip, Siu-Wan; Lin, Wen-Chuan; Chen, Guang-Wei, 2006	Curcumin-induced apoptosis of human colon cancer colon 205 cells through the production of ROS, Ca2+ and the activation of caspase-3	Anticancer Research	186	3	Anticancer, Natural products, Pharmacology
3	Su, Chin-Cheng, 2006	Curcumin inhibits cell migration of human colon cancer colon 205 cells through the inhibition of nuclear factor kappa B /p65 and down-regulates cyclooxygenase-2 and matrix metalloproteinase-2 expressions	Anticancer Research	122	3	Pharmacology, Anticancer
4	Kurien, Biji T., 2007	Improving the solubility and pharmacological efficacy of curcumin by heat treatment	Assay and Drug Development Technologies	296	2	Pharmacological phytochemistry
5	Kirana, Chandra, 2003	Antitumor activity of extract of Zingiber aromaticum and its bioactive sesquiterpenoid zerumbone	Nutrition and Cancer	112	2	Phytochemistry, Anticancer
6	Goel, Ajay, 2008	Curcumin as "Curecumin": From kitchen to clinic	Biochemical Pharmacology	1,921	1	Phytochemistry, Clinical Aspect
7	Chen, A., 2006	Curcumin inhibits human colon cancer cell growth by suppressing gene expression of epidermal growth factor receptor through reducing the activity of the transcription factor EGR-1	Oncogene	276	1	Biology molecular, Herbal Medicine
8	Jeong, Woo-Sik, 2004	Modulatory properties of various natural chemopreventive agents on the activation of NF- κB signaling pathway	Pharmaceutical Research	251	1	Natural products, Anticancer
9	Milacic, Vesna, 2008	Curcumin inhibits the proteasome activity in human colon cancer cells in vitro and in vivo	Cancer Research	238	1	Phytochemistry, Anticancer
10	Mcfadden, Rita-Marie T., 2015	The role of curcumin in modulating colonic microbiota during colitis and colon cancer prevention	Inflammatory Bowel Diseases	175	1	Biologycal activity, Anticancer, Microbiological Investigation
11	Basile, Valentina. 2009	Curcumin derivatives: Molecular basis of their anti-cancer activity	Biochemical Pharmacology	172	1	Anticancer, Natural products
12	Johnson, Sara M., 2009	Curcumin inhibits proliferation of colorectal carcinoma by modulating Akt/mTOR signaling	Anticancer Research	155	1	Pharmacological phytochemistry

Ranking	First author and year	Document title	Journal	Citations	LS*	Research focus
13	Ryu, Min-Jung. 2008	Natural derivatives of curcumin attenuate the Wnt/β-catenin pathway through down-regulation of the transcriptional coactivator p300	Biochemical and Biophysical Research Communications	134	1	Biology molecular, Herbal Medicine
14	Leal, Patrícia F. 2003	Functional properties of spice extracts obtained via supercritical fluid extraction	Journal of Agricultural and Food Chemistry	131	1	Phytochemistry, Pharmaceuticals development
15	Mosieniak, Grazyna, 2012	Curcumin induces permanent growth arrest of human colon cancer cells: Link between senescence and autophagy	Mechanisms of Ageing and Development	130	1	Pharmacological, Phytochemistry
16	Lee, Youn Ju, 2011	Involvement of ROS in curcumin-induced autophagic cell death	Korean Journal of Physiology and Pharmacology	126	1	Pharmacology, Anticancer
17	Yance Jr., Donald R. , 2006	Targeting angiogenesis with integrative cancer therapies	Integrative Cancer Therapies	119	1	Therapeutics cancer,
18	Bartik, Leonid , 2010	Curcumin: A novel nutritionally derived ligand of the vitamin D receptor with implications for colon cancer chemoprevention	Journal of Nutritional Biochemistry	116	1	Nutraceuticals, Anticancer
19	Guo, Li-Da, 2013	Curcumin inhibits proliferation and induces apoptosis of human colorectal cancer cells by activating the mitochondria apoptotic pathway	Phytotherapy Research	114	1	Pharmacology, Anticancer
20	Guo, Yue, 2015	Curcumin inhibits anchorage-independent growth of HT29 human colon cancer cells by targeting epigenetic restoration of the tumor suppressor gene DLEC1	Biochemical Pharmacology	102	1	Pharmacology, Anticancer

LS = Link Strength from VOSviewer

Fig. 2 showed the contributions of various countries to research on the effects of Surcumin sp on Colorectal Cancer are evident through the number of publications and their average citations. The United States stands out with 19 articles and an impressive average of 212.84 citations per article, reflecting the high quality and influence of its research within the scientific community. China leads in total articles with 32 but has a lower average citation rate of 35.78, suggesting a stronger emphasis on publication quantity alongside robust internal collaboration but a more fragmented impact.

Meanwhile, Korea, despite having only 8 articles, achieves a respectable average citation of 55.12, indicating that its fewer publications still hold significant relevance. India contributes the least with 6 articles and an average of 33.17 citations, suggesting a smaller yet meaningful role in fostering internal collaboration and research advancement in this area. Overall, these findings highlight the varying levels of internal collaboration and research quality across different countries, with the USA demonstrating a balance between quantity and impact, while other nations tend to excel in one aspect or the other.

An analysis of various countries' contributions to internal collaboration reveals that the USA excels in quality, boasting a very high citation average. The quality of was assessed through bibliometric measures such as citation counts and Link Strength (LS). Citation counts reflect how often a paper is referenced by other researchers, serving as a proxy for the paper's impact. Additionally, Link Strength (LS) measures how strongly an article connects with other documents in the research network, indicating its relevance and influence within specific research clusters. These metrics, along with the analysis of the average citation rate, allowed the authors to infer that the USA's research in this field tends to be more influential and of higher quality compared to other nations, despite the greater volume of publications from countries like China.

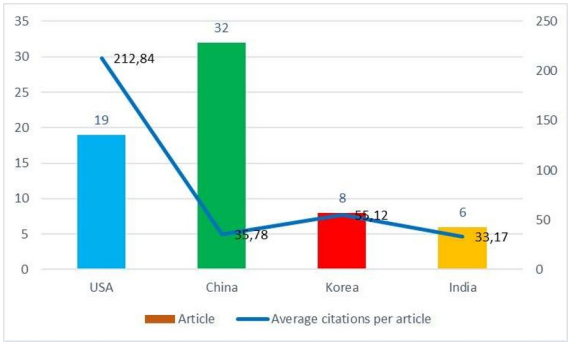

Fig. 2. Most Cited Countries

In contrast, China produces the largest number of articles, albeit with a lower impact. This suggests a divergence in research strategies: the USA emphasizes thorough, high-quality research that holds significant relevance in the global scientific community, while

China focuses on initial exploration and preliminary studies.

Although Korea has published only 8 articles, it features a higher citation average per article (55.12) compared to China, indicating a more efficient approach to producing high-quality research. This highlights the importance of prioritizing quality over quantity. Additionally, India, which has substantial potential for research on natural resources like curcumin, has made initial contributions that mark a promising start. Given the abundance of natural resources that support curcumin-related research, India has a strong opportunity to boost its contributions.

This data highlights the significance of cross-border collaboration, which can merge the resources of China and India with the research expertise of the USA and Korea. Such partnerships will expedite the advancement of curcumin research and its potential as an effective therapy for colon cancer. To amplify the global influence of this research, these countries should broaden international collaborations, integrate their research resources, and focus on research areas of high clinical relevance. This approach is anticipated to enhance global scientific contributions and speed up the translation of research findings into clinical practice.

Fig. 2. illustrates the citation counts for research publications concerning curcumin, sourced from various countries. This data highlights how different nations contribute to scientific advancements, indicated by the frequency with which their research is referenced by other scholars. An analysis of citations by country has unveiled notable disparities in research output and the individual impact of articles. The United States stands out with the highest total citations and average impact per article, surpassing Italy, Canada, Brazil, and Poland. This indicates that while the volume of research from America may be less, its findings have a strong influence on the international scientific community. Concurrently, China, Korea, and Japan are emerging as significant contributors to global research, particularly in new sectors. The variety in citation stats underscores the intricate dynamics of global scientific collaboration and rivalry, where both the amount and the quality of research shape the overall landscape.

In recent years, international collaboration has become more pronounced, as evidenced by contributions from authors across countries such as the United States, China, and Korea. For instance, while China leads in the number of publications, the United States excels in the quality and impact of its research, with high citation counts per article demonstrates how varying levels of research output and citation impact reflect different national priorities: some countries focus on high-output research, while others concentrate on achieving high-impact studies.

The increasing complexity of curcumin research, particularly in its application to colorectal cancer, has led to multi-disciplinary teams working together across borders. For example, research topics are expanding from basic molecular mechanisms of curcumin's anticancer properties to clinical trials and innovative drug delivery methods, such as nanoparticle formulations, to address curcumin's low bioavailability. This evolution in research shows how growing scientific challenges, such as the need for more effective cancer therapies, require collaboration across various sectors and expertise levels, thus fostering innovation in curcumin-based treatments.

3.4 Analysis of authors and their bibliographical coupling network

The analysis of authors and their bibliographical coupling network in Table 5 shows that there are five studies that focus on curcumin, each showing significant contributions to the field with variations in total citations and average citations per year. Research by Goel A., Kunnumakkara A.B., and Aggarwal B.B. has the highest total citations (1,921) with an average of 113 citations per year, indicating a tremendous impact in the field of biochemical pharmacology, especially with the concept of curcumin as "Curecumin." This research was conducted at the University of Texas, an institution with a strong reputation in the field of experimental research. Furthermore, research by Kurien B.T. and collaborators generated 296 citations at an average of 16.44 per year, focused on developing methods to improve solubility and pharmacological efficacy curcumin through heat treatment, which is relevant in drug development technology at the Medical Research Foundation, Oklahoma City.

Research conducted by Chen A. and his team accumulated 276 citations (14.53 per year), emphasizing how curcumin's molecular mechanism inhibits the growth of colon cancer by reducing the expression of the epidermal growth factor receptor gene. This work represents a significant contribution from the LSU Health Sciences Center. Meanwhile, Jeong W.-S. and colleagues, with 251 citations (11.95 per year), showcased the effectiveness of natural chemopreventive agents in modulating the NF-κB signaling pathway, a critical area in pharmaceutical research at Rutgers University. Lastly, the study by Milacic V. and his team garnered 238 citations (14 per year), focusing on curcumin's impact on proteasome activity in colon cancer cells, both in vitro and in vivo, underscoring the role of proteasome mechanisms in cancer pathology, conducted at Wayne State University.

Analyzing bibliographic coupling networks based on authors reveals how authors link through shared references in their studies. Key authors like Goel A., Kunnumakkara A.B., and Aggarwal B.B. lead the network with the most citations (1,921) and the highest annual average of citations (113). Their research focuses on curcumin's potential as a therapeutic agent and holds significant relevance across various scientific fields. Consequently, it is frequently cited by other researchers in pharmacology, biochemistry, and oncology.

Table 5. Analysis of authors and their bibliographical coupling network

No	Author name	Total Citation	Average citation per Year	Affiliation/ Country	Discipline	Description of Studies
1	Goel A.; Kunnumakkara A.B.; Aggarwal B.B.	1921	113.00	Departments of Experimental Therapeutics, The, University of Texas	Biochemical Pharmacology	Curcumin as "Curecumin": From kitchen to clinic
2	Kurien B.T.; Singh A.; Matsumoto H.; Scofield R.H.	296	16.44	Medical Research Foundation, Oklahoma City	Assay and Drug Development Technologies	Improving the solubility and pharmacological efficacy of curcumin by heat treatment
3	Chen A.; Xu J.; Johnson A.C.	276	14.53	Department of Pathology, LSUHSC-S, BRI F8-20, Shreveport, LA	Oncogene	Curcumin inhibits human colon cancer cell growth by suppressing gene expression of epidermal growth factor receptor through reducing the activity of the transcription factor Egr-1
4	Jeong W.-S.; Kim I.W.; Hu R.; Kong A., N.T.	251	11.95	Department of Pharmaceutics, Ernest Mario School of Pharmacy, Rutgers, the State Univ. of NJ	Pharmaceutical Research	Modulatory properties of various natural chemopreventive agents on the activation of NF-κB signaling pathway
5	Milacic V.; Banerjee S.; Landis Piwowar K.R.; Sarkar F.H.; Majumdar A.P.N.; Dou Q.P.	238	14.00	Department of Pathology, School of Medicine, Wayne State University	Cancer Research	Curcumin inhibits the proteasome activity in human colon cancer cells in vitro and in vivo

The article, authored by Kurien B.T. and his team, emphasizes their research aimed at enhancing the pharmacological effectiveness of curcumin. They are also linked with researchers exploring pharmaceutical formulation and drug development techniques. This connection allows for the integration of diverse subthemes, including formulation technology and pharmacokinetics.

Clustering studies focused on research topics reveal that authors with similar interests often belong to the same group. This is illustrated in the work by Chen A. and colleagues, who explore the molecular mechanisms of curcumin's influence on cancer gene expression, likely placing them in the same cluster as Milacic V. and his team, as both emphasize curcumin's role in cancer therapy and its molecular mechanisms. Additionally, Jeong W.-S. and his research group, which examines the NF-κB signaling pathway in chemopreventive agents, might constitute another cluster connected to experts in pharmacology and immunology.

The topic of Coupling Strength indicates that highly cited authors like Goel A. not only significantly influence their fields but also tend to establish strong ties within the coupling network due to their frequently referenced research. In contrast, researchers like Kurien B.T., despite having lower citation counts than Goel A., can exhibit strong connections within the internal networks of specific subdisciplines, for instance, pharmaceutical technology or curcumin formulation.

The analysis of Collaboration and Citation Overlap indicates that the collaboration between authors significantly affects network strength. Notably, highly cited researchers like Aggarwal B.B. demonstrate that their research and publications not only have a substantial influence but also serve as a vital connection between fundamental research and the therapeutic uses of curcumin. This analysis highlights how the coupling network captures the strength of scientific collaboration in fostering shared knowledge across different curcumin-related subdisciplines.

3.5 Keyword co-occurance networks and overlay

Keywords and networking can identify the most significant and impactful terms. They likely shed light on essential research topics in the field, utilizing a quick, objective, and reproducible method [6]. For this analysis, we extracted keywords and their frequency from various publications, including titles, abstracts, and both author-provided and indexed keywords [6]. The bibliometric analysis reveals the co-occurrence results between the author network and the overlay, displayed in Table 6 below.

Table 6. Highlights of Keyword co-occurence nertwork analysis based on all keywords

Keyword	Interpretation
Cluster 1 (Red Node)	
alcohol, angiongenesis, antiangiogenic activity, anticancer, anticarcinogenic agents, antiinflammatory activity, antineoplastic activity, antineoplactic agents, antioxidant, antioxidant activity, breast cancer, cancer chemotherapy, cancer therapy, cell strain ht29, colon cancer, curcuma, curcuma longa, curcuma longa extract, cyclooxygenase 2, cytotoxicity, didemethoxycurcumin, drug activity, drug efficacy, drug isolation, drug mechanism, drug megadose, drug potency, drug potentiation, drug safety, drug screening assays, antitumor, drug structure, drug synthesis, enzyme linked immunosorbent assay, epidermal growth factor receptor, ginger extract, glutathione, herbaceous agent, high performance liquid chromatography, humans, immunoglobulin enhancer binding protein, lipid peroxidation, lung cancer, mass spectrometry, medicinal plant, molecular docking, molecular structure, neovascularization, pathologic, plant extracts, polyphenol, quercetin, rhizome, structure-activity relationship, turmeric, unclassified drug, zingiber officinale	A holistic approach from angiogenesis, natural products, and drug mechanisms, to improve clinical outcomes for cancer patients through the development of more effective and safe therapies. CANCER THERAPY LS 95 → Dominants
Cluster 2 (Green Node)	
acetylcysteine, adenocarcinoma, antineoplastic agents, phytogenic, antineoplastic combined, antiproliferative activity, apoptosis, cancer cell culture, cancer growth, cancer inhibition, caspase 3, caspase 9, cell cycle, cell cycle arrest, cell cycle checkpoints, cell cycle gl phase, cell strain hct116, colon adenocarcinoma, comparative study, concentration response, cytocrome c, dna damage, dna tragmentation, dose response, dose-response relationship, drug synergism, enzyme activation, enzyme activity, flow cytometry, g1 phase cell cycle checkpoint, growth inhibition, hct116 cells, ht-29 cell line, ht29 cells, isolation and purification, lactate dehydrogenase, mitochondria, mitochondrial membrane, mitochondrion, nf-kappa b, nicotinamide adenine dinucleotide adenosine diphosphate ribosyltransferase, oxidative,stress, phytotherapy, protein bax, protein bcl2, Protein bcl xl, protein p21, protein p5, reactive oxygen metabolite, reactive oxygen species, ROS, sesquiterpenoid tumor suppressor protein, zingiberaceae	Phytotherapy-based approaches in cancer treatment, with an emphasis on understanding the molecular mechanisms underlying anticancer effects and improving therapeutic outcomes. APOPTOSIS : LS 54 → Dominants
Cluster 3 (Blue Node)	
adult, animal cell, animal experiment, animal model, animal tissue, animals, azoxymethane, bagg albino mouse, beta catenin, beta elemene, carcinogenesis, colon, colon carcinogenese, colorectal cancer cell line, Curcuma aromatica, Cyclin d1, Cycline, Drug bioavailability, drug screening, essential oil, female, fluorouracil, folinic acid, gene expression, histopathology, immunohistochemistry, In vivo study, liver metastasis, male mice, mice inbred balb.c, mice, nude, mouse, myc protein, Nonhuman, Nude mouse, Oxaliplatin, polymerase chain reaction procedures, rats, rats, sprague-dawley, real time polymerase chain, reverse transcription polymerase chain reaction, rna extraction, sesquiterpenes, sprague dawey rat, survival rate, tumor growth, tumor volume, tumor xenograft, turmerone, wnt protein, xenograft model antitumor	The approach in this research emphasizes an in-depth understanding of cancer mechanisms and potential new therapies through the use of animal models, in this case mice, and molecular analysis. IN VIVO STUDY : LS 47 → Dominants
Cluster 4 (Yellow Node)	
autophagy, cancer cell, cell invasion, cell line, tumor, cell migration, cell motion, cell movement, cell proliferation, cell viability, chemokine receptor cxcr4, colony formation, colorectal cancer, colorectal neoplasme, colorectal tumor, down regulation, drug cytotoxicity, drug affects, epithelial mesenchymal transition, fibroblast, g2 phase cell cycle check, gelatinase b, expression regulation, genetic transcription, genetics, hct116 cell line, human cell, IC50, immunoblotting, immunofluorescence, in vitro study, interleukin 1-β, interleukin 6, metastasis, mitogen activated protein, MTT assay, neoplasm metastasis, nerve cell adhesion molecular, protein, protein degradation, protein ex preflon, protein kinase b, protein phosphorlation, signal transduction, sw480 cell line, transcription factor rela, tumor cell line, tumor invasion, tumor microenvironment, turmeric extract, upregulation, western blotting	Comprehensive studies for in-depth understanding of cellular mechanisms, gene regulation, and interactions in the tumor microenvironment are key to developing more effective cancer therapies. IN VITRO STUDY : LS 76 → Dominants

Keyword	Interpretation
Cluster 5 (Purple Node)	
blotting western, caco-2 cells, Cancer prevention, cell culture, cell death, Cell growth, Cell line, Cell survival, cell, Chemistry, Chemoprevention, Chemoprophylaxis colon tumor Colonic neoplasms curcumin curcuminoids demethoxycurcumin diseases drug antagonism, drug carriers, drugs formulation, Enzymes Innibition, humen tissue inducible nitric oxide syn Inflammation Intestinal mucosa Messanger Metabolism Nanoparticles Pathology, RNA messager.	This research integrates various approaches to understand cancer mechanisms and develop more effective prevention and treatment strategies. CURCUMIN : LS 83 → Dominants

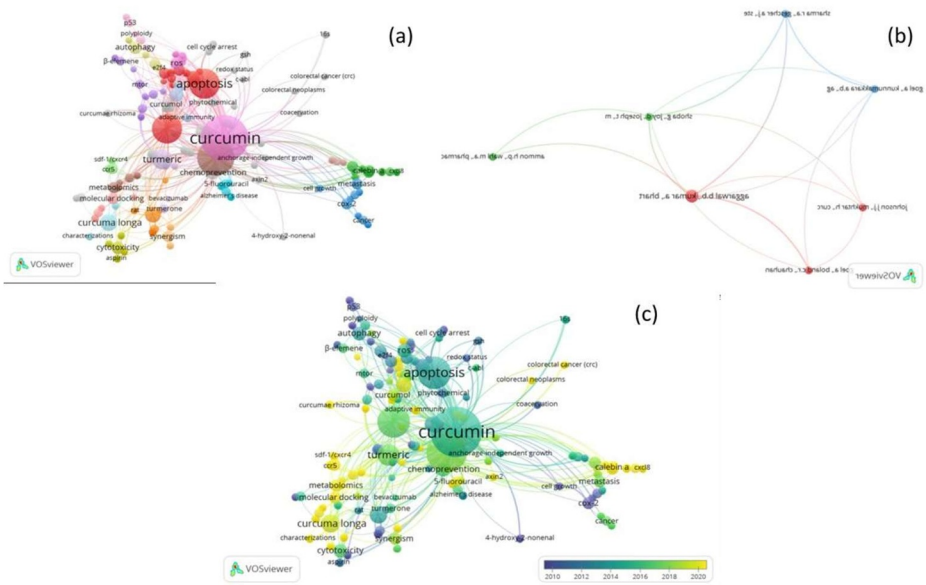

Fig. 3. (a) Keyword co-occurence networks, (b) Co-citation network of cited references, (c) Keyword co-occurence overlay with a time frame

Table 6 presents the results of the network search and keywords, which reveal five distinct clusters. Cluster 1 focuses on a holistic perspective of angiogenesis, emphasizing natural products and drug mechanisms to enhance clinical outcomes for cancer patients by creating more effective and safer therapies. Cluster 2 centers on phytotherapy approaches in cancer treatment, highlighting the importance of comprehending the molecular mechanisms that drive anticancer effects and improve therapeutic results. Cluster 3 advocates for a deeper understanding of cancer mechanisms and potential new therapies utilizing animal models, specifically mice, along with molecular analysis. Cluster 4 involves extensive studies of cellular mechanisms, gene regulation, and interactions within the tumor microenvironment, crucial for developing improved cancer therapies. Finally, Cluster 5 combines various strategies to investigate cancer mechanisms and formulate prevention approaches.

The findings from the network search and keywords are illustrated in Table 6, revealing five clusters. Cluster 1 explores a holistic strategy encompassing angiogenesis, natural products, and drug mechanisms aimed at enhancing clinical outcomes for cancer patients by advancing more effective and safer therapies. Cluster 2 focuses on phytotherapy-based methods for cancer treatment, emphasizing a deeper understanding of the molecular mechanisms behind anticancer effects and improving therapeutic results. Cluster 3 encourages a thorough exploration of cancer mechanisms and the possibility of new therapies through the application of animal models, particularly mice, alongside molecular analysis. Cluster 4 highlights the importance of comprehensive studies on cellular mechanisms, gene regulation, and interactions within the tumor microenvironment to develop more effective cancer therapies, while Cluster 5 combines various methods to unravel cancer mechanisms and formulate prevention strategies.

3.6 Visualization of VOSviewer

The visualization results from VOSviewer are shown below, illustrating keyword and citation networks derived from the bibliometric analysis conducted in this study, as depicted in Fig. 3.

However, this study has several limitations such as the data were exclusively obtained from the Scopus database, which may not encompass all pertinent papers indexed in alternative databases such as Google Scholar or Web of Science. The search was limited to publications using particular keywords, potentially omitting pertinent items that did not utilize these terms. The study's timeframe (2003–2023) may neglect earlier or more contemporary studies. Furthermore, omitting non-English publications and studies not explicitly pertaining to Curcuma sp. and colorectal cancer may result in selection bias. Ultimately, only original

research articles were used, excluding review articles and other publications that would offer a more comprehensive viewpoint.

4 Conclusion

A bibliometric analysis of scientific publications from 2003 to 2023 reveals notable trends in growth, impact, and collaboration in research. The consistent rise in publications, particularly in recent years, alongside elevated citation rates, shows that researchers are making significant contributions in critical fields like cancer research. The rise in collaborative efforts, both nationally and internationally, underscores the growing complexity of scientific inquiries that necessitate varied expertise.

The analysis highlighted several important thematic areas, particularly curcumin and cancer research, as focal points. These results underscore the need for ongoing investment in collaborative and interdisciplinary research to tackle global health issues.

More research is necessary to investigate the long-term effects of this publication, particularly regarding technological innovation and clinical applications. Moreover, future analyses could gain insights by examining how funding sources affect research trends and the changing role of open access in influencing the spread of scientific knowledge.

We thank the PhD Program of the Faculty of Pharmacy, Universitas Gadjah Mada, Yogyakarta Indonesia, for supporting this study.

The authors declare no conflict of interest.

References

1. H. Sung, J. Ferlay, R.L. Siegel, M. Laversanne, I. Soerjomataram, A. Jemal, F. Bray, CA Cancer J. Clin. **71**, 3 (2021)
2. A.H. Chu, K. Lin, H. Croker, S. Kefyalew, G. Markozannes, K.K. Tsilidis, Y. Park, J. Krebs, M.P. Weijenberg, M.L. Baskin, E. Copson, S.J. Lewis, J.C. Seidell, R. Chowdhury, L. Hill, D.S. Chan, D.H. Lee, E.L. Giovannucci, Am. J. Clin. Nutr. **121**, 5 (2025)
3. J. Wang, L. Qi, L. Mei, Z. Wu, Pak. J. Pharm. Sci. **30**, 5 (2017)
4. A. Husni, T. Pratiwi, A.G. Samudra, A.E. Nugroho, Proc. Pak. Acad. Sci. B Life Environ. Sci. **5**, 3 (2018)
5. F.H. Arifah, A.E. Nugroho, A. Rohman, W. Sujarwo, S. Afr. J. Bot. **151** (2022)
6. U.K. Bamel, R. Pandey, A. Gupta, Accid. Anal. Prev. **135** (2020)
7. N.J. Van Eck, L. Waltman, *VOSviewer Manual* (2020)
8. N. Esmaealzadeh, M. Miri, H. Mavaddat, et al., Inflammopharmacology **32** (2024)
9. S. Bakrim, N. El Omari, O.M. El Yaagoubi, A. Khalid, A.N. Abdalla, S.M.A. Hamza, S.E. Ibrahim, F. Atifi, Y. Zaid, A. Bouyahya, M. El Fessikh, L.C. Ming, T. Aanniz, Cell Biol. Toxicol. **41**, 1 (2025)
10. F. Liu, D. Ma, X. Luo, Z. Zhang, L. He, Y. Gao, D.J. McClements, Food Hydrocoll. **79** (2018)
11. B. Zhang, W. Guo, Z. Chen, Y. Chen, R. Zhang, M. Liu, J. Yang, J. Zhang, Pharmaceutics **17**, 3 (2025)
12. R.-M.T. McFadden, C.B. Larmonier, K.W. Shehab, M. Midura-Kiela, R. Ramalingam, C.A. Harrison, D.G. Besselsen, J.H. Chase, J.G. Caporaso, C. Jobin, F.K. Ghishan, P.R. Kiela, Inflamm. Bowel Dis. **21** (2015)
13. K. Kaur, A.K. Al-Khazaleh, D.J. Bhuyan, F. Li, C.G. Li, Antioxidants **13,** 9 (2024)
14. W. Deng, X. Xiong, M. Lu, et al., BMC Cancer **24** (2024)
15. S.G. Gurunani, S.A.A. Qamar Ali, N.G. Tiwari, M.U.W. Pasha, S.A. Dubey, Int. J. Res. Publ. Rev. **6**, 6 (2025)

Appendix 1 Bibliographic dataset of publications on *Curcuma sp.* as a colorectal cancer drug (2003–2023)

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
2003	Leal P.F.; Braga M.E.M.; Sato D.N.; Carvalho J.E.; Marques M.O.M.; Meireles M.A.A.	LASEFI-DEA/FEA-UNICAMP, State University of Campinas, 13083-970 Campinas, Sao Paulo, Caixa Postal 6121, Brazil; Instituto Adolfo Lutz, Laboratorio de Ribeirao Preto, Campos Elíseos, Ribeirao Preto, Sao Paulo 14085-410, Rua Minas 877, Brazil; CPQBA, Estrada PLN 393, 13081-970 Paulinia, Sao Paulo, Vila Betel Caixa Postal 6171, Brazil; LPN-Laboratorio de Produtos Naturais, IAC, 13001-970 Campinas, São Paulo, Caixa Postal 28, Brazil	Functional properties of spice extracts obtained via supercritical fluid extraction	J. Agric. Food Chem.	131	10.1021/jf0260693
2003	Kirana C.; Record I.R.; McIntosh G.H.; Jones G.P.	Fac. of Math. and Natural Sciences, University of Brawijaya, Malang, Indonesia; Health Sciences and Nutrition, CSIRO, Adelaide, SA, Kintore Ave, Australia; Departement of Medicine, Adelaide University, Adelaide, SA, Australia; Dept. of Hort., Viticulture/Oenology, Adelaide University, Adelaide, SA, Australia; CSIRO Health Sciences and Nutrition, Adelaide, SA 5000, P.O. Box 10041, Australia	Screening for antitumor activity of 11 species of Indonesian zingiberaceae using human MCF-7 and HT-29 cancer cells	Pharm. Biol.	60	10.1076/phbi.41.4.271.15673
2003	Kirana C.; McIntosh G.H.; Record I.R.; Jones G.P.	Health Sciences and Nutrition, CSIRO, Adelaide, SA, Kintore Ave, Australia	Antitumor activity of extract of Zingiber aromaticum and its bioactive sesquiterpenoid zerumbone	Nutr. Cancer	112	10.1207/S15327914NC4502_12
2004	Jeong W.-S.; Kim I.-W.; Hu R.; Kong A.-N.T.	Department of Pharmaceutics, Ernest Mario School of Pharmacy, Rutgers, the State Univ. of NJ, Piscataway, NJ 08854, United States	Modulatory properties of various natural chemopreventive agents on the activation of NF-κB signaling pathway	Pharm. Res.	251	10.1023/B:PHAM.0000022413.43212.cf
2004	Rashmi R.; Kumar S.; Karunagaran D.	Division of Cancer Biology, Rajiv Gandhi Ctr. for Biotechnology, Thiruvananthapuram, Kerala 695014, India	Ectopic expression of Bcl-XL or Ku70 protects human colon cancer cells (SW480) against curcumin-induced apoptosis while their down-regulation potentiates it	Carcinogenesis	43	10.1093/carcin/bgh213
2006	Reddy S.; Rishi A.K.; Xu H.; Levi E.; Sarkar F.H.; Majumdar A.P.N.	Karmanos Cancer Institute, Department of Internal Medicine, Wayne State University, Detroit, MI 48201, United States; John D. Dingell VA Medical Center, Detroit, MI 48201, 4646 John R., United States	Mechanisms of curcumin- and EGF-receptor related protein (ERRP)-dependent growth inhibition of colon cancer cells	Nutr. Cancer	53	10.1207/s15327914nc5502_10
2006	Chen A.; Xu J.; Johnson A.C.	Department of Pathology, Louisiana State University Health Sciences Center in Shreveport, Shreveport, LA, United States; Department of Cellular Biology	Curcumin inhibits human colon cancer cell growth by suppressing gene expression of	Oncogene	276	10.1038/sj.onc.1209019

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		and Anatomy, Louisiana State University Health Sciences Center in Shreveport, Shreveport, LA, United States; Laboratory of Molecular Biology, Center for Cancer Research, National Cancer Institute, Bethesda, MD, United States; Department of Pathology, LSUHSC-S, BRI F8-20, Shreveport, LA 71130, 1501 kings Hwy, United States	epidermal growth factor receptor through reducing the activity of the transcription factor Egr-1			
2006	Yance Jr. D.R.; Sagar S.M.	Center for Natural Healing, Ashland, OR, United States; Juravinski Cancer Centre, McMaster University, Department of Medicine, Hamilton, Ont., Canada; Juravinski Cancer Centre, McMaster University (Department of Medicine), Hamilton, Ont. L8V 5C2, 699 Concession Street, Canada	Targeting angiogenesis with integrative cancer therapies	Integr. Cancer Ther.	119	10.1177/1534735405285562
2006	Su C.-C.; Chen G.-W.; Lin J.-G.; Wu L.-T.; Chung J.-G.	School of Chinese Medicine, China Medical University, Taichung City 404, Taiwan; Department of Microbiology, China Medical University, Taichung City 404, Taiwan; School of Biological Science and Technology, China Medical University, Taichung City 404, Taiwan; Division of General Surgery, Department of Surgery, Buddhist Tzu Chi General Hospital, Hualien, 970, No 707, Sec. 3, Chung Yang Road, Taiwan; Department of Microbiology, School of Biological Science and Technology, China Medical University, Taichung 404, 91 Hsueh-Shih Road, Taiwan	Curcumin inhibits cell migration of human colon cancer colo 205 cells through the inhibition of nuclear factor kappa B /p65 and down-regulates cyclooxygenase-2 and matrix metalloproteinase-2 expressions	Anticancer Res.	122	
2006	Su C.-C.; Lin J.-G.; Li T.-M.; Chung J.-G.; Yang J.-S.; Ip S.-W.; Lin W.-C.; Chen G.-W.	School of Chinese Medicine, China Medical University, Taichung City 404, No 91, Hsueh-Shih Road, Taiwan; Department of Microbiology, China Medical University, Taichung City 404, No 91, Hsueh-Shih Road, Taiwan; Department of Pharmacology, China Medical University, Taichung City 404, No 91, Hsueh-Shih Road, Taiwan; Department of Nutrition, China Medical University, Taichung City 404, No 91, Hsueh-Shih Road, Taiwan; School of Biological Science and Technology, China Medical University, Taichung City 404, No 91, Hsueh-Shih Road, Taiwan; Division of General Surgery, Department of Surgery, Buddhist Tzu Chi General Hospital, Hualien, 970, No 707, Sec. 3, Chung Yang Road, Taiwan; School of Chinese Medicine, China Medical University, Taichung 404, No 91, Hsueh-Shih Road, Taiwan	Curcumin-induced apoptosis of human colon cancer colo 205 cells through the production of ROS, Ca2+ and the activation of caspase-3	Anticancer Res.	186	
2006	Lev-Ari S.; Maimon Y.; Strier L.;	Department of Cancer Prevention, Sackler School of Medicine, Tel Aviv University, Tel Aviv, Israel; Unit	Down-regulation of prostaglandin E2 by curcumin	J. Soc. Integr. Oncol.	61	10.2310/7200.2005.012

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
	Kazanov D.; Arber N.	of Complementary Medicine, Tel Aviv University, Tel Aviv, Israel; Department of Cancer Prevention, Tel Aviv University, Tel Aviv, Israel; Integrated Cancer Prevention Center, Tel Aviv Sourasky Medical Center, Tel Aviv 64239, 6 Weizmann Street, Israel	is correlated with inhibition of cell growth and induction of apoptosis in human colon carcinoma cell lines			
2007	Hsu Y.-C.; Weng H.-C.; Lin S.; Chien Y.W.	InnovaTherapeutics Research Center, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan; Graduate Institute of Medical Genetics, College of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan; Graduate Institute of Pharmaceutical Sciences, College of Pharmacy, Kaohsiung Medical University, Kaohsiung, Taiwan; InnovaTherapeutics Research Center, Kaohsiung Medical University, Kaohsiung 807, 100 Shih-Chuan 1st Road, Taiwan	Curcuminoids - Cellular uptake by human primary colon cancer cells as quantitated by a sensitive Hplc assay and its relation with the inhibition of proliferation and apoptosis	J. Agric. Food Chem.	48	10.1021/jf070684v
2007	Cheng Y.; Kozubek A.; Ohlsson L.; Sternby B.; Duan R.-D.	Biomedical Centre, B11, Institution of Clinical Sciences, Lund University, Lund, Sweden; Gastroenterology Lab., Biomedical Centre B11, Lund University, 22184, Lund, Sweden	Curcumin decreases acid sphingomyelinase activity in colon cancer caco-2 cells	Planta Med.	27	10.1055/s-2007-981540
2007	Kurien B.T.; Scofield R.H.	Arthritis and Immunology Program, Oklahoma City, OK 73104, United States; Department of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, OK 73104, United States; Department of Veterans Affairs Medical Center, Oklahoma City, OK 73104, United States	Curcumin/turmeric solubilized in sodium hydroxide inhibits HNE protein modification-An in vitro study	J. Ethnopharmacol.	43	10.1016/j.jep.2006.09.034
2007	Kurien B.T.; Singh A.; Matsumoto H.; Scofield R.H.	Arthritis and Immunology Program, Oklahoma Medical Research Foundation, University of Oklahoma Health Sciences Center, Oklahoma City, OK, United States; Department of Biochemistry and Molecular Biology, University of Oklahoma Health Sciences Center, Oklahoma City, OK, United States; Department of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, OK, United States; Department of Veterans Affairs Medical Center, Oklahoma City, OK, United States; Oklahoma Medical Research Foundation, Oklahoma City, OK 73104, 825 NE 13th Street, United States	Improving the solubility and pharmacological efficacy of curcumin by heat treatment	Assay Drug Dev. Technol.	296	10.1089/adt.2007.064
2008	Ryu M.-J.; Cho M.; Song J.-Y.; Yun Y.-S.; Choi I.-W.; Kim D.-E.; Park B.-S.; Oh S.	PharmacoGenomics Research Center, Inje University, Busan, 614-735, South Korea; Lab. of Radiation Cancer Science, Korea Institute of Radiological and Medical Sciences, Seoul, 139-706, South Korea; Department of Microbiology, Center for Viral Disease Research, Inje University College	Natural derivatives of curcumin attenuate the Wnt/β-catenin pathway through down-regulation of the transcriptional coactivator p300	Biochem. Biophys. Res. Commun.	134	10.1016/j.bbrc.2008.10.171

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		of Medicine, Busan, 614-735, South Korea; Department of Bioscience and Biotechnology, Konkuk University, Seoul, 143-701, South Korea; Institute of Ecological Phytochemistry, Hankyang National University, Ansung, 456-749, South Korea				
2008	Goel A.; Kunnumakkara A.B.; Aggarwal B.B.	Gastrointestinal Cancer Research Laboratory, Department of Internal Medicine, Charles A. Sammons Cancer Center, Dallas, TX, United States; Cytokine Research Laboratory, Departments of Experimental Therapeutics, The University of Texas M. D. Anderson Cancer Center, Houston, TX, United States	Curcumin as "Curecumin": From kitchen to clinic	Biochem. Pharmacol.	1921	10.1016/j.bcp.2007.08.016
2008	Milacic V.; Banerjee S.; Landis-Piwowar K.R.; Sarkar F.H.; Majumdar A.P.N.; Dou Q.P.	Barbara Ann Karmanos Cancer Institute, School of Medicine, Wayne State University, Detroit, MI, United States; Department of Pathology, School of Medicine, Wayne State University, Detroit, MI, United States; Department of Internal Medicine, School of Medicine, Wayne State University, Detroit, MI, United States; John D. Dingell VA Medical Center, Wayne State University, Detroit, MI, United States; Prevention Program, Barbara Ann Karmanos Cancer Institute, Wayne State University, 540.1, Detroit, MI 48201, United States; Department of Pathology, School of Medicine, Wayne State University, 540.1, Detroit, MI 48201, 4100 John R. Road, United States	Curcumin inhibits the proteasome activity in human colon cancer cells in vitro and in vivo	Cancer Res.	238	10.1158/0008-5472.CAN-07-6246
2008	Kunnumakkara A.B.; Diagaradjane P.; Guha S.; Deorukhkar A.; Shentu S.; Aggarwal B.B.; Krishnan S.	Department of Experimental Therapeutics, University of Texas, M. D. Anderson Cancer Center, Houston, TX, United States; Department of Radiation Oncology, University of Texas, M. D. Anderson Cancer Center, Houston, TX, United States; Department of Gastroenterology, Hepatology and Nutrition, University of Texas, M. D. Anderson Cancer Center, Houston, TX, United States; Box 97, M. D. Anderson Cancer Center, Houston, TX 77030, 1515 Holcombe Boulevard, United States; Box 143, M. D. Anderson Cancer Center, Houston, TX 77030, 1515 Holcombe Boulevard, United States	Curcumin sensitizes human colorectal cancer xenografts in nude mice to γ-radiation by targeting nuclear factor-κB-regulated gene products	Clin. Cancer Res.	206	10.1158/1078-0432.CCR-07-4722
2008	Watson J.L.; Hill R.; Lee P.W.; Giacomantonio C.A.; Hoskin D.W.	Department of Surgery, Faculty of Medicine, Dalhousie University, Halifax, NS B3H 1X5, Canada; Department of Pathology, Faculty of Medicine, Dalhousie University, Halifax, NS B3H 1X5, Canada; Department of Microbiology and	Curcumin induces apoptosis in HCT-116 human colon cancer cells in a p21-independent manner	Exp. Mol. Pathol.	65	10.1016/j.yexmp.2008.02.002

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		Immunology, Faculty of Medicine, Dalhousie University, Halifax, NS B3H 1X5, Canada				
2009	Kang Y.-J.; Park K.-K.; Chung W.-Y.; Hwang J.-K.; Lee S.K.	College of Pharmacy, Ewha Womans University, Seoul 120-750, South Korea; College of Dentistry, Yonsei University, Seoul 120-749, South Korea; Department of Biotechnology, Yonsei University, Seoul 120-749, South Korea	Xanthorrhizol, a natural sesquiterpenoid, induces apoptosis and growth arrest in HCT116 human colon cancer cells	J. Pharmacol. Sci.	49	10.1254/jphs.09141FP
2009	Johnson S.M.; Gulhati P.; Arrieta I.; Wang X.; Uchida T.; Gao T.; Evers B.M.	Department of Surgery, University of Texas Medical Branch, Galveston, TX 77550, United States; Department of Pharmacology and Toxicology, University of Texas Medical Branch, Galveston, TX 77550, United States; Office of Biostatistics, University of Texas Medical Branch, Galveston, TX 77550, United States; Sealy Center for Cancer Cell Biology, University of Texas Medical Branch, Galveston, TX 77550, United States; Markey Cancer Center, University of Kentucky, Ben F. Roach Bldg., Lexington, KY 40536-0093, 800 Rose Street, CC140, United States	Curcumin inhibits proliferation of colorectal carcinoma by modulating Akt/mTOR signaling	Anticancer Res.	155	
2009	Basile V.; Ferrari E.; Lazzari S.; Belluti S.; Pignedoli F.; Imbriano C.	Dipartimento di Biologia Animale, Università di Modena e Reggio Emilia, 41100 Modena, via Campi 213 /D, Italy; Dipartimento di Chimica, Università di Modena e Reggio Emilia, 41100 Modena, via Campi 183, Italy	Curcumin derivatives: Molecular basis of their anti-cancer activity	Biochem. Pharmacol.	172	10.1016/j.bcp.2009.06.105
2009	Cheng C.-Y.; Lin Y.-H.; Su C.-C.	Institute of Medicine, Chung Shan Medical University, Taichung 40201, Taiwan; Changhua Christian Hospital, Changhua 500, Taiwan; Institute of Pharmacology and Toxicology, Tzu-Chi University, Hualien 970, Taiwan; Division of General Surgery, Buddhist Tzu Chi General Hospital, Hualien 970, No. 707, Sec. 3, Chung Yang Road, Taiwan	Sann-Joong-Kuey-Jian-Tang increases the protein expression of microtubule-associated protein II light chain 3 in human colon cancer colo 205 cells	Mol. Med. Rep.	8	10.3892/mmr_00000160
2010	Yamakoshi H.; Ohori H.; Kudo C.; Sato A.; Kanoh N.; Ishioka C.; Shibata H.; Iwabuchi Y.	Graduate School of Pharmaceutical Sciences, Tohoku University, Sendai, 6-3 Aobayama, Japan; Department of Clinical Oncology, Institute of Development, Aging and Cancer, Tohoku University, Sendai, Japan; Department of Clinical Oncology, Akita University Hospital, Akita, Japan	Structure-activity relationship of C5-curcuminoids and synthesis of their molecular probes thereof	Bioorg. Med. Chem.	69	10.1016/j.bmc.2009.12.045
2010	Bartik L.; Whitfield G.K.; Kaczmarska M.; Lowmiller C.L.; Moffet E.W.; Furmick J.K.; Hernandez Z.; Haussler C.A.;	Department of Biochemistry and Molecular Biophysics, College of Medicine, The University of Arizona, Tucson, AZ 85724, United States; Department of Basic Medical Sciences, College of Medicine, The University of Arizona, Phoenix, AZ 85004, United States; Department of Nutrition, Arizona State University at the Polytechnic Campus,	Curcumin: A novel nutritionally derived ligand of the vitamin D receptor with implications for colon cancer chemoprevention	J. Nutr. Biochem.	116	10.1016/j.jnutbio.2009.09.012

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
	Haussler M.R.; Jurutka P.W.	Mesa, AZ 85212, United States; School of Letters and Sciences, Arizona State University, Tempe, AZ 85287, United States; Division of Mathematical and Natural Sciences, Arizona State University at the West Campus, Glendale, AZ 85306, United States				
2010	Kim K.-C.; Lee C.	Department of Internal Medicine, College of Medicine, Catholic University of Daegu, Daegu 705-718, South Korea; Department of Biochemistry and Molecular Biology, School of Medicine, Yeungnam University, Daegu 705-717, 317-1, Daemyung-5 dong, South Korea; Aging-Associated Vascular Disease Research Center, School of Medicine, Yeungnam University, Daegu 705-717, South Korea	Curcumin induces downregulation of E2F4 expression and apoptotic cell death in HCT116 human colon cancer cells; involvement of reactive oxygen species	Korean J. Physiol. Pharmacol.	44	10.4196/kjpp.2010.14.6.391
2010	Pantazis P.; Varman A.; Simpson-Durand C.; Thorpe J.; Ramalingam S.; Subramaniam D.; Houchen C.; Ihnat M.; Anant S.; Ramanujam R.P.	Inc, Oklahoma City, Oklahoma, United States	Curcumin and turmeric attenuate arsenic-induced angiogenesis in ovo.	Altern Ther Health Med	13	
2011	Lee Y.J.; Kim N.-Y.; Suh Y.-A.; Lee C.	Department of Pharmacology, College of Medicine, Catholic University of Daegu, Daegu 705-718, South Korea; Department of Biochemistry and Molecular Biology, School of Medicine, Yeungnam University, Daegu 705-717, 317-1 Daemyung-5-dong, South Korea; Institute for Innovative Cancer Research, Asan Medical Center, Seoul 138-736, South Korea	Involvement of ROS in curcumin-induced autophagic cell death	Korean J. Physiol. Pharmacol.	126	10.4196/kjpp.2011.15.1.1
2011	Chirio D.; Gallarate M.; Peira E.; Battaglia L.; Serpe L.; Trotta M.	Dipartimento di Scienza e Tecnologia Del Farmaco, University of Torino, Italy; Dipartimento di Anatomia, Farmacologia e Medicina Legale, University of Torino, Italy	Formulation of curcumin-loaded solid lipid nanoparticles produced by fatty acids coacervation technique	J. Microencapsulation	78	10.3109/02652048.2011.590615
2011	Chen M.; Wang S.; Tan M.; Wang Y.	State Key Laboratory of Quality Research in Chinese Medicine, Institute of Chinese Medical Sciences, University of Macau, Taipa, Av. Padre Tomas Pereira S.J., Macao	Applications of nanoparticles in herbal medicine: Zedoary turmeric oil and its active compound β-elemene	Am. J. Chin. Med.	29	10.1142/S0192415X11009421
2011	Jung K.H.; Park J.-W.	School of Life Sciences and Biotechnology, College of Natural Sciences, Kyungpook National University, Taegu 702-701, South Korea	Suppression of mitochondrial NADP+-dependent isocitrate dehydrogenase activity enhances curcumin-induced apoptosis in HCT116 cells	Free Radic. Res.	16	10.3109/10715762.2010.540574
2011	Chen M.-J.; Chu Y.-Y.; Lai P.-H.;	Division of Traumatology, Department of Surgery, Chi Mei Medical Center, Tainan, Taiwan; Graduate Institute of Pharmaceutical Sciences, College of	Experimental results of colorectal cancer chemoprevention by	Dig. J. Nanomat. Biostr.	8	

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
	Cheng Y.-M.; Hsu Y.-C.	Pharmacy, Kaohsiung Medical University, Kaohsiung, Taiwan; Department of Obstetrics and Gynecology, Institute of Clinical Medicine, College of Medicine, National Cheng Kung University, Tainan, Taiwan; Graduate Institute of Medical Science, Tainan, Taiwan; Innovative Research Center of Medicine, College of Health Sciences, Chang Jung Christian University, Tainan, Taiwan	curcuminoids loaded nano-carrier drug delivery system increased in vitro biocompatibility			
2012	Choi H.A.; Kim M.-R.; Park K.A.; Hong J.	Department of Food Science and Technology, College of Natural Science, Seoul Womens University, Nowon-Gu, Seoul 139-774, 621 Hwarangro, South Korea	Interaction of over-the-counter drugs with curcumin: Influence on stability and bioactivities in intestinal cells	J. Agric. Food Chem.	10	10.1021/jf303534e
2012	Kubota M.; Shimizu M.; Sakai H.; Yasuda Y.; Terakura D.; Baba A.; Ohno T.; Tsurumi H.; Tanaka T.; Moriwaki H.	Department of Internal Medicine, Gifu University, Graduate School of Medicine, Gifu 501-1194, 1-1 Yanagido, Japan; Department of Oncologic Pathology, Kanazawa Medical University, Ishikawa, Japan	Preventive effects of curcumin on the development of azoxymethane-induced colonic preneoplastic lesions in male C57BL/KsJ-db/db obese mice	Nutr. Cancer	51	10.1080/01635581.2012.630554
2012	Patel M.; Thayyullathil F.; Chathoth S.; Hago A.; Pallichankandy S.; Rahman A.; Galadari S.	Cell Signaling Laboratory, Department of Biochemistry, Faculty of Medicine and Health Sciences, UAE University, Al Ain, PO Box 17666, United Arab Emirates	Curcumin induces human colon cancer cell death via p62/SQSTM1 degradation, phospho-ERK Up-regulation and ceramide generation	Curr. Trends Biotechnol. Pharm.	0	
2012	Mosieniak G.; Adamowicz M.; Alster O.; Jaskowiak H.; Szczepankiewicz A.A.; Wilczynski G.M.; Ciechomska I.A.; Sikora E.	Laboratory of Molecular Bases of Aging, Nencki Institute of Experimental Biology, PAS, 02-093 Warsaw, Poland; Laboratory of Molecular and Systemic Neuromorphology, Nencki Institute of Experimental Biology, PAS, 02-093 Warsaw, Poland; Laboratory of Transcription Regulation, Nencki Institute of Experimental Biology, PAS, 02-093 Warsaw, Poland	Curcumin induces permanent growth arrest of human colon cancer cells: Link between senescence and autophagy	Mech. Ageing Dev.	130	10.1016/j.mad.2012.05.004
2012	Chen M.-J.; Cheng Y.-M.; Lai P.-H.; Wu J.-F.; Hsu Y.-C.	Division of Traumatology, Department of Surgery, Chi Mei Medical Center, Tainan, Taiwan; Department of Obstetrics and Gynecology, Institute of Clinical Medicine, College of Medicine, Tainan, Taiwan; Graduate Institute of Pharmaceutical Sciences, College of Pharmacy, Kaohsiung Medical University, Kaohsiung, Taiwan; Department of Nutrition and Health Sciences, College of Health Sciences, Chang Jung Christian University, Tainan, Taiwan; Graduate Institute of Medical Science,	In vitro biocompatibility of thermally gelling liquid mucoadhesive loaded curcuminoids in colorectal cancer chemoprevention	Int. J. Colorectal Dis.	20	10.1007/s00384-011-1393-3

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		Innovative Research Center of Medicine, College of Health Sciences, Tainan, Taiwan				
2012	Yogosawa S.; Yamada Y.; Yasuda S.; Sun Q.; Takizawa K.; Sakai T.	Department of Molecular-Targeting Cancer Prevention, Graduate School of Medical Science, Kyoto Prefectural University of Medicine, Kamigyo-ku, Kyoto 602-8566, Kawaramachi-Hirokoji, Japan; Department of Food Science and Nutrition, Faculty of Human Life and Science, Doshisha Women's College of Liberal Arts, Kamigyo-ku, Kyoto 602-0893, Teramachi-Imadegawa, Japan	Dehydrozingerone, a structural analogue of curcumin, induces cell-cycle arrest at the G2/M phase and accumulates intracellular ROS in HT-29 human colon cancer cells	J. Nat. Prod.	64	10.1021/np300465f
2013	Batie S.; Lee J.H.; Jama R.A.; Browder D.O.; Montano L.A.; Huynh C.C.; Marcus L.M.; Tsosie D.G.; Mohammed Z.; Trang V.; Marshall P.A.; Jurutka P.W.; Wagner C.E.	School of Mathematical and Natural Sciences, New College of Interdisciplinary Arts and Sciences, Arizona State University, Glendale, AZ 85306, 4701 W. Thunderbird Road, United States	Synthesis and biological evaluation of halogenated curcumin analogs as potential nuclear receptor selective agonists	Bioorg. Med. Chem.	16	10.1016/j.bmc.2012.11.033
2013	Guo L.-D.; Chen X.-J.; Hu Y.-H.; Yu Z.-J.; Wang D.; Liu J.-Z.	Key Laboratory of Animal Physiology, Biochemistry and Molecular Biology of Hebei Province, College of Life Sciences, Hebei Normal University, Hebei 050016, China; Department of Environment and Chemical Engineering, Hebei College of Industry and Technology, Shijiazhuang, Hebei 050091, China; Experimental Center, Hebei Normal University, Shijiazhuang, Hebei 050016, China	Curcumin inhibits proliferation and induces apoptosis of human colorectal cancer cells by activating the mitochondria apoptotic pathway	Phytother. Res.	114	10.1002/ptr.4731
2013	Abdel-Rahman M.; Ahmed H.H.; Salem F.E.-Z.H.; Shalby A.B.; Lokman M.S.	Department of Zoology and Entomology, Helwan University, Cairo, Egypt; Hormones Department, Medical Research Division, National Research Centre, Dokki, Giza, Egypt	Curcuma longa and colon cancer: Evidence and mechanisms	World J. Med. Sci.	3	10.5829/idosi.wjms.2013.8.3.1118
2013	Yang C.; Su X.; Liu A.; Zhang L.; Yu A.; Xi Y.; Zhai G.	Department of Pharmaceutics, College of Pharmacy, Shandong University, Jinan 250012, 44 Wenhua Xilu, China; Department of Pharmacy, Qilu Hospital of Shandong University, Jinan 250012, China	Advances in clinical study of curcumin	Curr. Pharm. Des.	67	10.2174/138161213805289291
2013	Einbond L.S.; Mighty J.; Kashiwazaki R.; Figueroa M.; Jalees F.; Acuna U.M.; LeGendre O.; Foster D.A.; Kennelly E.J.	Columbia University College of Physicians and Surgeons, New York, NY 10032, United States; Lehman College and The Graduate Center, CUNY, New York, NY 10458, United States; The New York Botanical Garden, New York, NY 10458, United States; Universidad Nacional Autónoma de México, México DF 04510, Mexico; Hunter College and The	Garcinia benzophenones inhibit the growth of human colon cancer cells and synergize with sulindac sulfide and turmeric	Anti-Cancer Agents Med. Chem.	15	10.2174/18715206113139990095

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		Graduate Center, CUNY, New York, NY, 10065, United States				
2013	Murakami A.; Furukawa I.; Miyamoto S.; Tanaka T.; Ohigashi H.	Division of Food Science and Biotechnology, Graduate School of Agriculture, Kyoto University, Kyoto 606-8502, Japan; The First Department of Pathology, Kanazawa Medical University, Uchinada, Ishikawa 920-0293, 1-1 Daigaku, Japan; The Tohkai Cytopathology Institute: Cancer Research and Prevention (TCI-CaRP) 4-33 Minami-Uzura, Gifu 500-8285, Japan; Center for Molecular Medicine, University of Connecticut Health Center, Farmington, Connecticut, United States; Faculty of Biotechnology, Prefectural University, Fukui, Japan	Curcumin combined with turmerones, essential oil components of turmeric, abolishes inflammation-associated mouse colon carcinogenesis	BioFactors	59	10.1002/biof.1054
2014	Shen Y.; Lu B.; Zhang S.; Ma Z.-J.	Department of Gastroenterology, First Affiliated Hospital of Zhejiang Chinese Medical University, Hangzhou 310005, Zhejiang Province, China; Department of Gastroenterology, Second Affiliated Hospital of Zhejiang Chinese Medical University, Hangzhou, Zhejiang Province, China; Institute of Pharmaceutical Informatics, School of Pharmaceutical Sciences of Zhejiang University, Hangzhou, Zhejiang Province, China	Diterpenoid C of Radix Curcumae: An inhibitor of proliferation and inducer of apoptosis in human colon adenocarcinoma cells acting via inhibiting MAPK signaling pathway	Pharm. Biol.	21	10.3109/13880209.2013.879907
2014	Zheng A.; Li H.; Wang X.; Feng Z.; Xu J.; Cao K.; Zhou B.; Wu J.; Liu J.	Center for Mitochondrial Biology and Medicine, The Key Laboratory of Biomedical Information Engineering of Ministry of Education, School of Life Science and Tech. and Frontier Institute of Life Science, FIST, Xi'an Jiaotong Univ., Xi'an 710049, China; State Key Laboratory of Applied Organic Chemistry, Lanzhou University, Lanzhou, Gansu 730000, 222 Tianshui Street S., China	Anticancer effect of a curcumin derivative B63: ROS production and mitochondrial dysfunction	Curr. Cancer Drug Targets	38	10.2174/15680096136661311261154444
2014	Nida Fathima D.	Saveetha Dental College, Chennai, India	Curcumin -Role in cancer	J. Pharm. Sci. Res.	4	
2014	Wang Y.-T.; Liu H.-S.; Su C.-L.	Department of Human Development and Family Studies, National Taiwan Normal University, Taipei 106, No. 162, Sec. 1, He-ping East Road, Taiwan; Department of Microbiology and Immunology, Medical College, National Cheng Kung University, Tainan, Taiwan; Center of Infectious Disease and Signaling Research Center, College of Medicine, National Cheng Kung University, Tainan, Taiwan	Curcumin-enhanced chemosensitivity of FDA-approved platinum (II)-based anti-cancer drugs involves downregulation of nuclear endonuclease G and NF-κB as well as induction of apoptosis and G2/M arrest	Int. J. Food Sci. Nutr.	25	10.3109/09637486.2013.871694
2014	Somchit M.; Changtam C.; Kimseng R.; Utaipan T.; Lertcanawanichakul	School of Allied Health Sciences and Public Health, Walailak University, Nakhon Si Thammarat, Thailand; Faculty of Science and Technology, Huachiew Chalermprakiet University, Samutprakarn, Thailand; Center for Scientific and Technological	Demethoxycurcumin from curcuma longa rhizome suppresses iNOS induction in an in vitro inflamed human intestinal mucosa model	Asian Pac. J. Cancer Preven.	24	10.7314/APJCP.2014.15.4.1807

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
	M.; Suksamrarn A.; Chunglok W.	Equipments, Walailak University, Nakhon Si Thammarat, Thailand; Department of Chemistry and Center of Excellence for Innovation in Chemistry, Faculty of Science, Ramkhamhaeng University, Bangkok, Thailand				
2015	Rouhollahi E.; Moghadamtousi S.Z.; Al-Henhena N.; Kunasegaran T.; Hasanpourghadi M.; Looi C.Y.; Abd Malek S.N.; Awang K.; Abdulla M.A.; Mohamed Z.	Pharmacogenomics Laboratory, Department of Pharmacology, University of Malaya, Kuala Lumpur, Malaysia; Institute of Biological Sciences, University of Malaya, Kuala Lumpur, Malaysia; Department of Biomedical Science, University of Malaya, Kuala Lumpur, Malaysia; Cell Biology and Drug Discovery Laboratory, Department of Pharmacology, University of Malaya, Kuala Lumpur, Malaysia; Department of Chemistry, University of Malaya, Kuala Lumpur, Malaysia	The chemopreventive potential of Curcuma purpurascens rhizome in reducing azoxymethane-induced aberrant crypt foci in rats	Drug Des. Dev. Ther.	16	10.2147/DDDT.S84560
2015	Guo Y.; Shu L.; Zhang C.; Su Z.-Y.; Kong A.-N.T.	Graduate Program in Pharmaceutical Sciences, Ernest Mario School of Pharmacy, State University of New Jersey, Piscataway, 08854, NJ, United States; Department of Pharmaceutics, Ernest Mario School of Pharmacy, State University of New Jersey, 160 Frelinghuysen Road, Piscataway, 08854, NJ, United States	Curcumin inhibits anchorage-independent growth of HT29 human colon cancer cells by targeting epigenetic restoration of the tumor suppressor gene DLEC1	Biochem. Pharmacol.	102	10.1016/j.bcp.2015.01.009
2015	Chaithongyot S.; Asgar A.; Senawong G.; Yowapuy A.; Lattmann E.; Sattayasai N.; Senawong T.	Department of Biochemistry, Faculty of Science, Khon Kaen University, Khon Kaen, Thailand; Program in Biological Science, Faculty of Science, Khon Kaen University, Khon Kaen, Thailand; Division of Pharmacy, School of Life and Health Sciences, Aston University, Birmingham, United Kingdom; Natural Product Research Unit, Faculty of Science, Khon Kaen University, Khon Kaen, Thailand; Food and Product Chemical Analysis Group, Faculty of Science, Khon Kaen University, Khon Kaen, Thailand	Anticancer effects of Curcuma C20-dialdehyde against colon and cervical cancer cell lines	Asian Pac. J. Cancer Preven.	3	10.7314/APJCP.2015.16.15.6513
2015	Mcfadden R.-M.T.; Larmonier C.B.; Shehab K.W.; Midura-Kiela M.; Ramalingam R.; Harrison C.A.; Besselsen D.G.; Chase J.H.; Caporaso J.G.; Jobin C.; Ghishan F.K.; Kiela P.R.	Department of Pediatrics, Steele Children's Research Center, University of Arizona, 1501 N. Campbell Avenue, Tucson, 85724, AZ, United States; School of Dentistry, Oral Biology Program, University of North Carolina, Chapel Hill, NC, United States; University Animal Care, University of Arizona, Health Sciences Center, Tucson, AZ, United States; Department of Biological Sciences, Center for Microbial Genetics and Genomics, Northern Arizona University, Flagstaff, AZ, United States; Department of Medicine, College of Medicine, University of	The role of curcumin in modulating colonic microbiota during colitis and colon cancer prevention	Inflammatory Bowel Dis.	175	10.1097/MIB.0000000000000522

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		Florida, Gainesville, FL, United States; Department of Immunobiology, University of Arizona, Health Sciences Center, Tucson, AZ, United States				
2015	Rouhollahi E.; Zorofchian Moghadamtousi S.; Paydar M.; Fadaeinasab M.; Zahedifard M.; Hajrezaie M.; Abdalla Ahmed Hamdi O.; Yeng Looi C.; Ameen Abdulla M.; Awang K.; Mohamed Z.	Department of Pharmacology, Faculty of Medicine, University of Malaya, Kuala Lumpur, 50603, Malaysia; Institute of Biological Sciences, Faculty of Science, University of Malaya, Kuala Lumpur, 50603, Malaysia; Department of Chemistry, Faculty of Science, University of Malaya, Kuala Lumpur, 50603, Malaysia; Department of Biomedical Science, Faculty of Medicine, University of Malaya, Kuala Lumpur, 50603, Malaysia	Inhibitory effect of Curcuma purpurascens Bl. rhizome on HT-29 colon cancer cells through mitochondrial-dependent apoptosis pathway	BMC Complement. Altern. Med.	33	10.1186/s12906-015-0534-6
2015	Shaikh A.M.; Shrivastava B.; Apte K.G.; Navale S.D.	APT Research Foundation, S. No 36/1/1; M. N. 199, Vadgaon Khurd, Pune, 411041, MH, India; School of Pharmaceutical Sciences, Jaipur National University, Jaipur, Rajasthan, India; BSDTAM Integrated Cancer Treatment and Research Center (ICTRC), Wagholi, Pune, MH, India	Effect of aqueous extract of Curcuma zedoaria and Gloriosa superba against DMH-induced colon carcinogenesis in wistar rats	Int. J. Pharm. Res.	10	
2015	Lee J.-G.; McKinney K.Q.; Pavlopoulos A.J.; Park J.-H.; Hwang S.	Proteomics Laboratory for Clinical and Translational Research, Carolinas HealthCare System, Charlotte, 28203, NC, United States; College of Pharmacy, Seoul National University, Seoul, 151-742, South Korea	Identification of anti-metastatic drug and natural compound targets in isogenic colorectal cancer cells	J. Proteomics	18	10.1016/j.jprot.2014.10.009
2015	Wang J.; Huang F.; Bai Z.; Chi B.; Wu J.; Chen X.	College of Pharmacy, Guilin Medical University, Guilin, 541004, China; Research Center for Science, Guilin Medical University, Guilin, 541004, China; Intensive Care Unit, Zhuzhou Central Hospital, Zhuzhou, 412007, China	Curcumol inhibits growth and induces apoptosis of colorectal cancer LoVo cell line via IGF-1R and p38 MAPK pathway	Int. J. Mol. Sci.	66	10.3390/ijms160819851
2015	Tyagi A.K.; Prasad S.; Yuan W.; Li S.; Aggarwal B.B.	Cytokine Research Laboratory, Department of Experimental Therapeutics Unit 1950, University of Texas MD Anderson Cancer Center, 1515 Holcombe Blvd, Houston, 77030, TX, United States; National Center for Pharmaceutical Crops, Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University, Nacogdoches, TX, United States	Identification of a novel compound (β-sesquiphellandrene) from turmeric (Curcuma longa) with anticancer potential: Comparison with curcumin	Invest. New Drugs	88	10.1007/s10637-015-0296-5
2016	Yue G.G.-L.; Kwok H.-F.; Lee J.K.-M.; Jiang L.; Wong E.C.-W.; Gao S.; Wong H.-L.; Li L.;	Institute of Chinese Medicine, Chinese University of Hong Kong, E305, Science Centre, New Territories, Shatin, Hong Kong; State Key Laboratory of Phytochemistry and Plant Resources in West China, Chinese University of Hong Kong, New Territories,	Combined therapy using bevacizumab and turmeric ethanolic extract (with absorbable curcumin)	Pharmacol. Res.	45	10.1016/j.phrs.2016.05.025

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
	Chan K.-M.; Leung P.-C.; Fung K.-P.; Zuo Z.; Lau C.B.-S.	Shatin, Hong Kong; School of Biomedical Sciences, Chinese University of Hong Kong, New Territories, Shatin, Hong Kong; School of Pharmacy, Chinese University of Hong Kong, New Territories, Shatin, Hong Kong	exhibited beneficial efficacy in colon cancer mice			
2016	Naick H.; Jin S.; Baskaran R.	Department of Biochemistry & Molecular Biology, Pondicherry University, RV Nagar, Puducherry, 605014, India; Pittsburgh Cancer Institute, Pittsburgh, 15261, PA, United States	GADD45α modulates curcumin sensitivity through c-Abl- and JNK-dependent signaling pathways in a mismatch repair-dependent manner	Mol. Cell. Biochem.	7	10.1007/s11010-016-2654-9
2016	Jayaprakasha G.K.; Chidambara Murthy K.N.; Patil B.S.	Vegetable and Fruit Improvement Center, Department of Horticultural Sciences, Texas A&M University, College Station, 77845-2119, TX, United States; Central Research Laboratory, MS Ramaiah Medical College & Hospitals, MSR Nagar, MSRIT Post, Bangalore, 560 054, India	Enhanced colon cancer chemoprevention of curcumin by nanoencapsulation with whey protein	Eur. J. Pharmacol.	54	10.1016/j.ejphar.2016.07.017
2016	Yue G.G.L.; Jiang L.; Kwok H.-F.; Lee J.K.M.; Chan K.-M.; Fung K.-P.; Leung P.-C.; Lau C.B.-S.	Institute of Chinese Medicine, The Chinese University of Hong Kong, Shatin, Hong Kong; State Key Laboratory of Phytochemistry and Plant Resources in West China (CUHK), The Chinese University of Hong Kong, Shatin, Hong Kong; School of Biomedical Sciences, The Chinese University of Hong Kong, Shatin, Hong Kong	Turmeric ethanolic extract possesses stronger inhibitory activities on colon tumour growth than curcumin - The importance of turmerones	J. Funct. Foods	36	10.1016/j.jff.2016.02.011
2016	Chen M.; May B.H.; Zhou I.W.; Xue C.C.L.; Zhang A.L.	China-Australia International Research Centre for Chinese Medicine, School of Health Sciences, RMIT University, Melbourne, Australia; Guangdong Provincial Hospital of Chinese Medicine, Guangdong Provincial Academy of Chinese Medical Sciences, Second Clinical College, Guangzhou University of Chinese Medicine, Guangzhou, China	Meta-analysis of oxaliplatin-based chemotherapy combined with traditional medicines for colorectal cancer: Contributions of specific plants to tumor response	Integr. Cancer Ther.	26	10.1177/1534735415596424
2016	Adeyeni T.A.; Khatwani N.; San K.; Ezekiel U.R.	Department of Biomedical Laboratory Science, Saint Louis University, St. Louis, MO, United States; Department of Health Science and Informatics, Saint Louis University, St. Louis, MO, United States	BMI1 is downregulated by the natural compound curcumin, but not by bisdemethoxycurcumin and dimethoxycurcumin	Physiol. Rep.	6	10.14814/phy2.12906
2017	Dasiram J.D.; Ganesan R.; Kannan J.; Kotteeswaran V.; Sivalingam N.	Department of Biotechnology, School of Bioengineering, SRM University, Kattankulathur, 603203, Tamilnadu, India	Curcumin inhibits growth potential by G1 cell cycle arrest and induces apoptosis in p53-mutated COLO 320DM human colon adenocarcinoma cells	Biomed. Pharmacother.	42	10.1016/j.biopha.2016.12.034

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
2017	Ooko E.; Kadioglu O.; Greten H.J.; Efferth T.	Department of Pharmaceutical Biology, Institute of Pharmacy and Biochemistry, Johannes Gutenberg University, Mainz, Germany; Heidelberg School of Chinese Medicine, Heidelberg, Germany; Abel Salazar Biomedical Sciences Institute, University of Porto, Porto, Portugal	Pharmacogenomic characterization and isobologram analysis of the combination of ascorbic acid and curcumin-two main metabolites of Curcuma longa-in cancer cells	Front. Pharmacol.	43	10.3389/fphar.2017.00038
2017	Jaksevicius A.; Carew M.; Mistry C.; Modjtahedi H.; Opara E.I.	School of Life Sciences, Pharmacy and Chemistry, Kingston University, Penrhyn Road, Kingston upon Thames, KT1 2EE, United Kingdom	Inhibitory effects of culinary herbs and spices on the growth of HCA-7 colorectal cancer cells and their COX-2 expression	Nutrients	18	10.3390/nu9101051
2017	Ozawa H.; Imaizumi A.; Sumi Y.; Hashimoto T.; Kanai M.; Makino Y.; Tsuda T.; Takahashi N.; Kakeya H.	Theravalues Corp., 3-12 Kioi-cho, Chiyoda-ku, Tokyo, 102-0094, Japan; TheraBioPharma Inc., 604 East Wing, KSP Innovation Center Bldg., 3-2-1 Sakado, Takatsu-ku, Kawasaki, 213-0012, Japan; Department of Clinical Oncology, Kyoto University Hospital Cancer Center, 54 Shogoin Kawahara-cho, Sakyo-ku, Kyoto, 606-8507, Japan; Faculty of Pharmacy, Musashino University, 1-1-20 Shinmachi, Nishitokyo, Tokyo, 202-8585, Japan; College of Bioscience and Biotechnology, Chubu University, Kasugai, Aichi, 487-8501, Japan; Department of System Chemotherapy and Molecular Sciences, Division of Bioinformatics and Chemical Genomics, Graduate School of Pharmaceutical Sciences, Kyoto University, 46-29 Shimo-Adachi-cho, Yoshida, Sakyo-ku, Kyoto, 606-8501, Japan	Curcumin β-D-glucuronide plays an important role to keep high levels of free-form curcumin in the blood	Biol. Pharm. Bull.	35	10.1248/bpb.b17-00339
2018	Lee Y.-H.; Song N.-Y.; Suh J.; Kim D.-H.; Kim W.; Ann J.; Lee J.; Baek J.-H.; Na H.-K.; Surh Y.-J.	Tumor Microenvironment Global Core Research Center and Research Institute of Pharmaceutical Sciences, College of Pharmacy, Seoul National University, Seoul, 08826, South Korea; Division of Colon and Rectal Surgery, Department of Surgery, Gil Medical Center, Gachon University College of Medicine, Incheon, 21565, South Korea; Department of Food Science and Biotechnology, College of Knowledge-Based Services Engineering, Sungshin Women's University, Seoul, 01133, South Korea; Cancer Research Institute, Seoul National University, Seoul, 03080, South Korea; Department of Molecular Medicine and Biopharmaceutical Sciences, College of Pharmacy, Seoul National University, Seoul, 08826, South Korea	Curcumin suppresses oncogenicity of human colon cancer cells by covalently modifying the cysteine 67 residue of SIRT1	Cancer Lett.	62	10.1016/j.canlet.2018.05.036

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
2018	Alkhader E.; Roberts C.J.; Rosli R.; Yuen K.H.; Seow E.K.; Lee Y.Z.; Billa N.	The School of Pharmacy, University of Nottingham Malaysia Campus, Semenyih, Selangor, Malaysia; School of Pharmacy, University of Nottingham, University Park, Nottingham, United Kingdom; University of Putra Malaysia-MAKNA Cancer Research Laboratory, Institute of Bioscience, University of Putra Malaysia, Serdang, Selangor, Malaysia; School of Pharmaceutical Sciences, University of Science Malaysia, School of Pharmacy, Minden, Penang, Malaysia	Pharmacokinetic and anti-colon cancer properties of curcumin-containing chitosan-pectinate composite nanoparticles	J. Biomater. Sci. Polym. Ed.	37	10.1080/09205063.2018.1541500
2018	Li M.; Yue G.G.-L.; Tsui S.K.-W.; Fung K.-P.; Lau C.B.-S.	School of Biomedical Sciences, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong; Institute of Chinese Medicine, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong; State Key Laboratory of Phytochemistry and Plant Resources in West China, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong	Turmeric extract, with absorbable curcumin, has potent anti-metastatic effect in vitro and in vivo	Phytomedicine	43	10.1016/j.phymed.2018.03.065
2018	Su M.-Q.; Zhou Y.-R.; Li C.-Q.; Wang Z.; Wang Y.-L.; Shen B.-Y.; Dou J.	School of Life Science and Technology, China Pharmaceutical University, Nanjing, Jiangsu, 210009, China; Rui Jin Hospital, School of Medicine, Shanghai Jiaotong University, Shanghai, 200025, China	Zedoary turmeric oil induces senescence and apoptosis in human colon cancer HCT116 cells	Nat. Pro. Comm.	8	10.1177/1934578x1801300731
2018	Agarwal A.; Kasinathan A.; Ganesan R.; Balasubramanian A.; Bhaskaran J.; Suresh S.; Srinivasan R.; Aravind K.B.; Sivalingam N.	Department of Biotechnology, School of Bioengineering, SRM Institute of Science and Technology, Kattankulathur, 603203, Tamilnadu, India	Curcumin induces apoptosis and cell cycle arrest via the activation of reactive oxygen species–independent mitochondrial apoptotic pathway in Smad4 and p53 mutated colon adenocarcinoma HT29 cells	Nutr. Res.	96	10.1016/j.nutres.2017.12.011
2018	Chen Y.C.; Chen B.H.	Department of Food Science, Fu Jen Catholic University, New Taipei City, 242, Taiwan	Preparation of curcuminoid microemulsions from: Curcuma longa L. to enhance inhibition effects on growth of colon cancer cells HT-29	RSC Adv.	25	10.1039/c7ra12297g
2018	Wang J.; Li X.-M.; Bai Z.; Chi B.-X.; Wei Y.; Chen X.	Xiangya Hospital Central South University, Chang sha, 410008, China; College of Pharmacy, Guilin Medical University, Guilin, 541004, China; Intensive Care Unit, Zhuzhou Central Hospital, Zhuzhou, 412007, China; Digestive System Department, The Frist People's Hospital of YueYang, Yueyang, 414000, China	Curcumol induces cell cycle arrest in colon cancer cells via reactive oxygen species and Akt/ GSK3β/cyclin D1 pathway	J. Ethnopharmacol.	89	10.1016/j.jep.2017.06.037

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
2019	Lübtow M.M.; Nelke L.C.; Seifert J.; Kühnemundt J.; Sahay G.; Dandekar G.; Nietzer S.L.; Luxenhofer R.	Functional Polymer Materials, Department of Chemistry and Pharmacy and Bavarian Polymer Institute, Würzburg University, Röntgenring 11, Würzburg, 97070, Germany; University Hospital Würzburg, Röntgenring 11, Würzburg, 97070, Germany; Translational Center 'Regenerative Therapies' (TLC-RT), Fraunhofer Institute for Silicate Research (ISC), Neunerplatz 2, Würzburg, 97082, Germany; Department of Pharmaceutical Sciences, College of Pharmacy, Oregon State University, Collaborative Life Science Building, 2730 SW Moody Avenue, Portland, 97201, OR, United States; Department of Biomedical Engineering, Oregon Health and Science University, Collaborative Life Science Building, 2730 SW Moody Avenue, Portland, 97201, OR, United States	Drug induced micellization into ultra-high capacity and stable curcumin nanoformulations: Physico-chemical characterization and evaluation in 2D and 3D in vitro models	J. Control. Release	60	10.1016/j.jconrel.2019.04.014
2019	Tan X.; Xu M.; Liu F.; Xu M.; Yao Y.; Tang D.	Nanjing University of Chinese Medicine, Nanjing, China; Department of Pharmacy, Affiliated Hospital of Nanjing University of Chinese Medicine, Nanjing, China; China Pharmaceutical University, Nanjing, China	Antimetastasis Effect of Astragalus membranaceus-Curcuma zedoaria via β-Catenin Mediated CXCR4 and EMT Signaling Pathway in HCT116	Evid.-Based Complement. Altern. Med.	17	10.1155/2019/9692350
2019	Hosseini S.A.; Zand H.; Cheraghpour M.	Nutrition and Metabolic Diseases Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, 6135715794, Iran; Department of Cellular and Molecular Nutrition, Faculty of Nutrition Science and Food Technology, National Nutrition and Food Technology Research Institute Shahid Beheshti University of Medical Sciences, Tehran, 1981619573, Iran	The influence of Curcumin on the downregulation of MYC, insulin and igf-1 receptors: A possible mechanism underlying the anti-growth and anti-migration in chemoresistant colorectal cancer cells	Medicina	29	10.3390/medicina55040090
2019	Buhrmann C.; Popper B.; Kunnumakkara A.B.; Aggarwal B.B.; Shakibaei M.	Musculoskeletal Research Group and Tumor Biology, Chair of Vegetative Anatomy, Institute of Anatomy, Faculty of Medicine, Ludwig-Maximilian-University Munich, Pettenkoferstrasse 11, Munich, D-80336, Germany; Biomedical Center, Core facility animal models, Ludwig-Maximilian-University Munich, Martinsried, D-82152, Germany; Institute of Pathology, School of Medicine, Technical University of Munich, Munich, D-81675, Germany; Cancer Biology Laboratory & DBT-AIST International Laboratory for Advanced Biomedicine (DAILAB), Department of Biosciences & Bioengineering, Indian Institute of Technology Guwahati, Assam, 781039,	Evidence that calebin A, a component of Curcuma longa suppresses NF-κB mediated proliferation, invasion and metastasis of human colorectal cancer induced by TNF-β (Lymphotoxin)	Nutrients	47	10.3390/nu11122904

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		India; Inflammation Research Center, San Diego, 92126, CA, United States				
2019	Wang J.-T.; Ge D.; Qu H.-F.; Wang G.-K.; Wang G.	School of Pharmacy, Anhui University of Chinese Medicine, Hefei, China; Synergetic Innovation Center of Anhui Authentic Chinese Medicine Quality Improvement, Hefei, China; Taihe Country in Anhui Province Limin Chinese Medicinal Materials Co. Ltd, Fuyang, China	Chemical constituents of Curcuma kwangsiensis and their antimigratory activities in RKO cells	Nat. Prod. Res.	8	10.1080/14786419.2018.1484463
2019	Kumboonma P.; Senawong T.; Saenglee S.; Senawong G.; Somsakeesit L.-O.; Yenjai C.; Phaosiri C.	Natural Products Research Unit, Center of Excellence for Innovation in Chemistry, Ministry of Higher Education, Science, Research and Innovation (Implementation Unit-IU, Khon Kaen University), Department of Chemistry, Faculty of Science, Khon Kaen University, Khon Kaen, 40002, Thailand; Natural Products Research Unit, Department of Biochemistry, Faculty of Science, Khon Kaen University, Khon Kaen, 40002, Thailand	New histone deacetylase inhibitors and anticancer agents from Curcuma longa	Med. Chem. Res.	8	10.1007/s00044-019-02414-5
2019	Calibasi-Kocal G.; Pakdemirli A.; Bayrak S.; Ozupek N.M.; Sever T.; Basbinar Y.; Ellidokuz H.; Yigitbasi T.	Dokuz Eylul University, Institute of Oncology, Department of Basic Oncology, Izmir, Turkey; Dokuz Eylul University, Vocational School of Health Services, Department of First and Emergency Aid, Izmir, Turkey; Dokuz Eylul University, Faculty of Medicine, Department of Cardiovascular Surgery, Izmir, Turkey; Dokuz Eylul University, Institute of Health Sciences, Department of Oncology, Izmir, Turkey; Dokuz Eylul University, Institute of Oncology, Department of Preventive Oncology, Izmir, Turkey; Istanbul Medipol University, Faculty of Medicine, Department of Biochemistry, Istanbul, Turkey	Curcumin effects on cell proliferation, angiogenesis and metastasis in colorectal cancer	J. B.U.ON.	57	
2020	Farhana L.; Sarkar S.; Nangia-Makker P.; Yu Y.; Khosla P.; Levi E.; Azmi A.; Majumdar A.P.N.	John D Dingell Veterans Affairs Medical Center, Detroit, MI, United States; Department of Internal Medicine, Wayne State University, School of Medicine, Detroit, MI, United States; Karmanos Cancer Institute, Detroit, MI, United States; Department of Nutrition and Food Science, Wayne State University, Detroit, MI, United States; Department of Pathology, Wayne State University, School of Medicine, Detroit, MI, United States	Natural agents inhibit colon cancer cell proliferation and alter microbial diversity in mice	PLoS ONE	19	10.1371/journal.pone.0229823
2020	Tomasello G.; Giammanco M.; Mazzola M.; Damiani P.; Ra' W.; Giammanco P.;	Department of Biomedical Neuroscience and Advanced Diagnosis; Department of Surgical Oncological and Oral Sciences, University of Palermo; University Hospital "P. Giaccone", Palermo; School of Medicine and Surgery, University	Antitumoral activity of curcumin: an adjuvant therapeutic strategy	J. Biol. Res.	0	10.4081/jbr.2020.8252

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
	Rappa F.; Pitruzzella A.; Saguto D.; Trapani B.D.; Taverna G.; Carini M.; Ciulla A.; Carini F.	of Palermo; Department of General Surgery, Torina Hospital, Palermo; University of Milano, Italy				
2020	Ismail N.I.; Othman I.; Abas F.; Lajis N.H.; Naidu R.	Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, Selangor, 47500, Malaysia; UniKL MESTECH, A1-1 Jalan TKS1,, Taman Kajang Sentral, Kajang, 43000, Malaysia; Laboratory of Natural Products, Faculty of Science, University Putra Malaysia, Serdang, 43400, Malaysia; Department of Food Science, Faculty of Food Science and Technology, University Putra Malaysia, Serdang, 43400, Malaysia	The Curcumin Analogue, MS13 (1,5-Bis(4-hydroxy-3-methoxyphenyl)-1,4-pentadiene-3-one), Inhibits Cell Proliferation and Induces Apoptosis in Primary and Metastatic Human Colon Cancer Cells	Molecules	20	10.3390/molecules25173798
2020	Chen T.; Yang C.; Xi Z.; Chen F.; Li H.	Department of Ultrasonography, First Affiliated Hospital of Zhejiang Chinese Medical University, Zhejiang Provincial Hospital of Traditional Chinese Medicine, Hangzhou, Zhejiang, China; Department of Emergency Medicine, Tongde Hospital of Zhejiang Province, Hangzhou, Zhejiang, China; Department of Ultrasonography, Jiangxi Agricultural University Hospital, Nanchang, Jiangxi, China	Reduced caudal type homeobox 2 (CDX2) promoter methylation is associated with curcumin's suppressive effects on epithelial-mesenchymal transition in colorectal cancer cells	Med. Sci. Monit.	8	10.12659/MSM.926443
2020	Venkatadri B.; Shanparvish E.; Rameshkumar M.R.; Arasu M.V.; Al-Dhabi N.A.; Ponnusamy V.K.; Agastian P.	Department of Plant Biology and Biotechnology, Loyola College (Autonomous), Affiliated to University of Madras, Chennai, 600034, Tamil Nadu, India; Laboratory Division, ICMR-National Institute of Epidemiology, Indian Council of Medical Research, Chennai, Tamil Nadu, India; Department of Botany and Microbiology, College of Science, King Saud University, P.O. Box 2455, Riyadh, 11451, Saudi Arabia; Department of Medicinal & Applied Chemistry, and Research Centre for Environmental Medicine, Kaohsiung Medical University (KMU), Kaohsiung City, 807, Taiwan; Department of Medical Research, Kaohsiung Medical University Hospital (KMUH), Kaohsiung City, 807, Taiwan	Green synthesis of silver nanoparticles using aqueous rhizome extract of Zingiber officinale and Curcuma longa: In-vitro anti-cancer potential on human colon carcinoma HT-29 cells	Saudi J. Biol. Sci.	78	10.1016/j.sjbs.2020.09.021
2020	Slika L.; Moubarak A.; Borjac J.; Baydoun E.; Patra D.	Department of Chemistry, Faculty of Arts and Sciences, American University of Beirut, Beirut, Lebanon; Department of Biological Sciences, Faculty of Sciences, Beirut Arab University, Debbieh, Lebanon; Department of Biology, Faculty of Arts and	Preparation of curcumin-poly (allyl amine) hydrochloride based nanocapsules: Piperine in nanocapsules accelerates encapsulation and release of	Mater. Sci. Eng. C	48	10.1016/j.msec.2019.110550

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		Sciences, American University of Beirut, Beirut, Lebanon	curcumin and effectiveness against colon cancer cells			
2021	Gu J.; Sun R.; Wang Q.; Liu F.; Tang D.; Chang X.	School of Traditional Chinese Medicine and School of Integrated Chinese and Western Medicine, Nanjing University of Chinese Medicine, Nanjing, China; School of Pharmacy, Anhui University of Chinese Medicine, Hefei, China	Standardized Astragalus Mongholicus Bunge-Curcuma Aromatica Salisb. Extract Efficiently Suppresses Colon Cancer Progression Through Gut Microbiota Modification in CT26-Bearing Mice	Front. Pharmacol.	32	10.3389/fphar.2021.714322
2021	Li M.; Yue G.G.-L.; Luo L.; Tsui S.K.-W.; Fung K.-P.; Ng S.S.-M.; Lau C.B.-S.	School of Biomedical Sciences, The Chinese University of Hong Kong, Hong Kong; Institute of Chinese Medicine and State Key Laboratory of Research on Bioactivities and Clinical Applications of Medicinal Plants, The Chinese University of Hong Kong, Hong Kong; The Marine Biomedical Research Institute, Guangdong Medical University, Zhanjiang, China; Department of Surgery, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong	Turmeric Is Therapeutic in Vivo on Patient-Derived Colorectal Cancer Xenografts: Inhibition of Growth, Metastasis, and Tumor Recurrence	Front. Oncol.	10	10.3389/fonc.2020.574827
2021	Seiwert N.; Fahrer J.; Nagel G.; Frank J.; Behnam D.; Kaina B.	Institute of Toxicology, University Medical Center, Mainz, Germany; Institute of Nutritional Sciences, University of Hohenheim, Stuttgart, Germany; Aquanova AG, Research and Development, Darmstad, Germany; Division of Food Chemistry and Toxicology, Department of Chemistry, Technical University Kaiserslautern, Erwin-Schrödinger Straße, Kaiserslautern, 67663, Germany	Curcumin Administered as Micellar Solution Suppresses Intestinal Inflammation and Colorectal Carcinogenesis	Nutr. Cancer	11	10.1080/01635581.2020.1771384
2021	Feng Y.; Deng L.; Guo H.; Zhao Y.; Peng F.; Wang G.; Yu C.	State Key Laboratory of Southwestern Chinese Medicine Resources, School of Basic Medicine, Chengdu University of Traditional Chinese Medicine, Chengdu, China; National Engineering Research Center for Biomaterials, Sichuan University, Chengdu, China; Southwest Jiaotong University, Chengdu, China; West China School of Pharmacy, Sichuan University, Chengdu, China	The Anti-Colon Cancer Effects of Essential Oil of Curcuma phaeocaulis Through Tumour Vessel Normalisation	Front. Oncol.	10	10.3389/fonc.2021.728464
2021	Liu S.; Li Q.; Liu F.; Cao H.; Liu J.; Shan J.; Dan W.; Yuan J.; Lin J.	Longhua Affiliated Hospital of Shanghai University of Traditional Chinese Medicine, Shanghai, 200032, China; Department of Gastroenterology, China-Canada Center of Research for Digestive Diseases, Institute of Digestive Diseases, Longhua Hospital, Shanghai University of Traditional Chinese Medicine, Shanghai, 200032, China; Key Laboratory of Chinese Internal Medicine of Ministry of Education and Beijing, Dongzhimen Hospital, Beijing University of Chinese Medicine, Beijing,	Uncovering the Mechanism of Curcuma in the Treatment of Ulcerative Colitis Based on Network Pharmacology, Molecular Docking Technology, and Experiment Verification	Evid.-Based Complement. Altern. Med.	18	10.1155/2021/6629761

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		100700, China; Beijing University of Chinese Medicine, Beijing, 100029, China; Department of Cardiology, China Academy of Chinese Medical Sciences, Guanganmen Hospital, Beijing, 100053, China				
2021	HAO J.; DAI X.; GAO J.; LI Y.; HOU Z.; CHANG Z.; WANG Y.	Key Laboratory of Resource Biology and Biotechnology in Western China, Ministry of Education, College of Life Science, Northwest University, Xi'an, Shaanxi, 710069, China; Food and Drug Technology Research Center, Shaanxi Province Food and Drug Supervision and Inspection Research, Shaanxi Institute for Food and Drug Control, Xi'an, Shaanxi, 710065, China	Curcumin suppresses colorectal tumorigenesis via the Wnt/β-catenin signaling pathway by downregulating Axin2	Oncol. Lett.	21	10.3892/ol.2021.12447
2021	Buhrmann C.; Brockmueller A.; Harsha C.; Kunnumakkara A.B.; Kubatka P.; Aggarwal B.B.; Shakibaei M.	Musculoskeletal Research Group and Tumor Biology, Chair of Vegetative Anatomy, Faculty of Medicine, Institute of Anatomy, Ludwig-Maximilian-University Munich, Munich, Germany; Faculty of Medicine, Institute of Anatomy and Cell Biology, University of Augsburg, Augsburg, Germany; Cancer Biology Laboratory and DBT-AIST International Center for Translational and Environmental Research (DAICENTER), Department of Biosciences and Bioengineering, Indian Institute of Technology Guwahati, Guwahati, India; Department of Medical Biology, Jessenius Faculty of Medicine, Comenius University in Bratislava, Martin, Slovakia	Evidence That Tumor Microenvironment Initiates Epithelial-To-Mesenchymal Transition and Calebin A can Suppress it in Colorectal Cancer Cells	Front. Pharmacol.	26	10.3389/fphar.2021.699842
2021	Rahim N.F.C.; Hussin Y.; Aziz M.N.M.; Mohamad N.E.; Yeap S.K.; Masarudin M.J.; Abdullah R.; Akhtar M.N.; Alitheen N.B.	Department of Cell and Molecular Biology, Faculty of Biotechnology and Biomolecular Sciences, University Putra Malaysia, UPM, Serdang, Selangor, 43400, Malaysia; Biotechnology Research Institute, University Malaysia Sabah, Kota Kinabalu, Sabah, 88400, Malaysia; China-ASEAN College of Marine Sciences, Xiamen University Malaysia, Sepang, Selangor, 43900, Malaysia; UPM-MAKNA Cancer Research Laboratory, Institute of Bioscience, University Putra Malaysia, Serdang, Selangor, 43400, Malaysia; Department of Veterinary Pathology and Microbiology, Faculty of Veterinary Medicine, University Putra Malaysia, UPM, Serdang, Selangor, 43400, Malaysia; Faculty of Industrial Sciences & Technology, University Malaysia Pahang, Lebuhraya Tun Razak, Kuantan, Pahang, 26300, Malaysia	Cytotoxicity and apoptosis effects of curcumin analogue (2E,6E)-2,6-Bis(2,3-Dimethoxybenzylidine) cyclohexanone (DMCH) on human colon cancer cells HT29 and SW620 in vitro	Molecules	16	10.3390/molecules26051261

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
2021	Makaremi S.; Ganji A.; Ghazavi A.; Mosayebi G.	Department of Immunology and Microbiology, School of Medicine, Arak University of Medical Sciences, Arak, Iran; Molecular and Medicine Research Center, Arak University of Medical Sciences, Arak, Iran; Traditional and Complementary Medicine Research Center (TCMRC), Arak University of Medical Sciences, Arak, Iran	Inhibition of tumor growth in CT-26 colorectal cancer-bearing mice with alcoholic extracts of Curcuma longa and Rosmarinus officinalis	Gene Rep.	15	10.1016/j.genrep.2020.101006
2021	Kaur H.; Moreau R.	Department of Nutrition and Health Sciences, University of Nebraska–Lincoln, Lincoln, 68583, NE, United States	Curcumin represses mTORC1 signaling in Caco-2 cells by a two-sided mechanism involving the loss of IRS-1 and activation of AMPK	Cell. Signal.	14	10.1016/j.cellsig.2020.109842
2021	Buhrmann C.; Kunnumakkara A.B.; Kumar A.; Samec M.; Kubatka P.; Aggarwal B.B.; Shakibaei M.	Musculoskeletal Research Group and Tumor Biology, Chair of Vegetative Anatomy, Institute of Anatomy, Faculty of Medicine, Ludwig-Maximilian-University Munich, Munich, Germany; Institute of Anatomy and Cell Biology, Faculty of Medicine, University of Augsburg, Augsburg, Germany; Cancer Biology Laboratory Department of Biotechnology-National institute of Advanced Industrial Science and Technology (DBT-AIST) International Center for Translational and Environmental Research (DAICENTER), Department of Biosciences Bioengineering, Indian Institute of Technology Guwahati, Assam, India; Department of Obstetrics and Gynecology, Jessenius Faculty of Medicine, Comenius University in Bratislava, Martin, Slovakia; Department of Medical Biology, Jessenius Faculty of Medicine, Comenius University in Bratislava, Martin, Slovakia; Inflammation Research Center, San Diego, CA, United States	Multitargeting Effects of Calebin A on Malignancy of CRC Cells in Multicellular Tumor Microenvironment	Front. Oncol.	23	10.3389/fonc.2021.650603
2021	Sun R.; Gu J.; Chang X.; Liu F.; Liang Y.; Yang X.; Liang L.; Tang D.	Basic Medical College, Nanjing University of Chinese Medicine, Nanjing Jiangsu, 210046, China; College of Pharmacy, Anhui University of Chinese Medicine, Hefei Anhui, 230012, China	Metabonomics study on orthotopic transplantion mice model of colon cancer treated with Astragalus membranaceus-Curcuma wenyujin in different proportions via UPLC-Q-TOF/MS	J. Pharm. Biomed. Anal.	28	10.1016/j.jpba.2020.113708
2021	Al Moubarak A.; El Joumaa M.; Slika L.; Patra D.; Borjac J.	Department of Biological Sciences, Beirut Arab University, Debbieh, Lebanon; Department of Chemistry, American University of Beirut, Beirut, Lebanon	Curcumin-Polyallyhydrocarbon Nanocapsules Potently Suppress 1,2-Dimethylhydrazine-Induced	BioNanoScience	7	10.1007/s12668-021-00842-5

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
			Colorectal Cancer in Mice by Inhibiting Wnt/β-Catenin Pathway			
2021	Kane A.M.; Liu C.; Akhter D.T.; McKeone D.M.; Bell C.A.; Thurecht K.J.; Leggett B.A.; Whitehall V.L.J.	QIMR Berghofer Medical Research Institute, Brisbane, QLD, Australia; Faculty of Medicine, The University of Queensland, Brisbane, QLD, Australia; Conjoint Internal Medicine Laboratory, Pathology Queensland, Queensland Health, Brisbane, QLD, Australia; Envoi Specialist Pathologists, Brisbane, QLD, Australia; Centre for Advanced Imaging, Australian Institute for Bioengineering and Nanotechnology, ARC Centre of Excellence in Bio-Nano Science and Technology, The University of Queensland, Brisbane, QLD, Australia; ARC Training Centre for Innovation in Biomedical Imaging Technology, The University of Queensland, Brisbane, QLD, Australia; Department of Gastroenterology and Hepatology, The Royal Brisbane and Women's Hospital, Queensland Health, Brisbane, QLD, Australia	Curcumin Chemoprevention Reduces the Incidence of Braf Mutant Colorectal Cancer in a Preclinical Study	Dig. Dis. Sci.	7	10.1007/s10620-020-06752-y
2021	Povichit N.; Muangthong T.; Aimvijarn P.; Suwannalert P.	Detox (Thailand) Co, Ltd., Chiangmai, Thailand; Department of Pathobiology, Faculty of Science, Mahidol University, Bangkok, Thailand; Pathology Information and Learning Center, Department of Pathobiology, Faculty of Science, Mahidol University, Bangkok, Thailand	Green Curmin Reduces Pro-inflammatory Cytokines and Fibroblast-Associated Colon Cancer Migration	Pharm. Sci.	1	10.34172/PS.2021.9
2022	Hosseini S.S.; Reihani R.Z.; Doustvandi M.A.; Amini M.; Zargari F.; Baradaran B.; Yari A.H.; Hashemi M.; Tohidast M.; Mokhtarzadeh A.	Department of Biotechnology, Higher Education Institute of Rab-Rashid, Tabriz, Iran; Immunology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran; Department of Medical Science, Marand Branch, Islamic Azad University, Marand, Iran; Nanotechnology Research Center, Pharmaceutical Technology Institute, Mashhad University of Medical Sciences, Mashhad, Iran	Synergistic anticancer effects of curcumin and crocin on human colorectal cancer cells	Mol. Biol. Rep.	10	10.1007/s11033-022-07719-0
2022	Waly M.I.; Al Subhi L.	Department of Food Science and Nutrition, Cams, Sultan Qaboos University, Muscat, Oman	Curcuma longa (Curcumin) Abrogates Hyperhomocysteinemia and Oxidative Stress in a Rat Model of Colon Cancer	Int. J. Nutr. Pharmacol. Neurol. Dis.	0	10.4103/ijnpnd.ijnpnd_22_22
2022	Li F.-F.; Zhang Y.-L.; Guo D.-X.; Zhao C.-J.; Yao Y.-F.; Lin Y.-Q.; Wang S.-Q.	School of Pharmaceutical Sciences, Shandong University, Shandong, Jinan, 250012, China; Zibo Institute for Food and Drug Control, Shandong, Zibo, 255086, China; Qilu Hospital of Shandong University, Shandong, Jinan, 250012, China;	Biochemometric approach combined with 1D CSSF-TOCSY for the identification of sensitization agents in Curcuma longa L. and	Microchem. J.	1	10.1016/j.microc.2022.107727

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
		Shandong Institute for Food and Drug Control, Shandong, Jinan, 250101, China; Zibo Hospital of Traditional Chinese Medicine, Shandong, Zibo, 255086, China	prediction of their action mechanisms			
2022	WANG G.-Y.; ZHANG L.; GENG Y.-D.; WANG B.; FENG X.-J.; CHEN Z.-L.; WEI W.; JIANG L.	Department of Pharmacy, First Affiliated Hospital of USTC, Division of Life Sciences and Medicine, University of Science and Technology of China, Hefei, 230001, Anhui, China; Institute of Clinical Pharmacology, Anhui Medical University, Hefei, 230001, China; Department of Pharmacy, Hefei Cancer Hospital, Chinese Academy of Sciences, Hefei, 230031, China	β-Elemene induces apoptosis and autophagy in colorectal cancer cells through regulating the ROS/AMPK/mTOR pathway	Chin. J. Nat. Med.	29	10.1016/S1875-5364(21)60118-8
2022	Yang J.; He C.; Liu N.	Central Laboratory, Second Hospital, Jilin University, Changchun, China; Clinical Laboratory, China-Japan Union Hospital, Jilin University, Changchun, China	Proteomic analysis of the chemosensitizing effect of curcumin on CRC cells treated with 5-FU	Front. Med.	2	10.3389/fmed.2022.1032256
2022	Gu J.; Sun R.; Tang D.; Liu F.; Chang X.; Wang Q.	School of Traditional Chinese Medicine and School of Integrated Chinese and Western Medicine, Nanjing University of Chinese Medicine, 138# Xianlin Road, Qixia District, Jiangsu Province, Nanjing, 210023, China; School of Pharmacy, Anhui University of Chinese Medicine, Hefei, 230012, China	Astragalus mongholicus Bunge-Curcuma aromatica Salisb. suppresses growth and metastasis of colorectal cancer cells by inhibiting M2 macrophage polarization via a Sp1/ZFAS1/miR-153-3p/CCR5 regulatory axis	Cell Biol. Toxicol.	24	10.1007/s10565-021-09679-w
2022	Liu F.; Liang Y.; Sun R.; Yang W.; Liang Z.; Gu J.; Zhao F.; Tang D.	School of Traditional Chinese Medicine and School of Integrated Chinese and Western Medicine, Nanjing University of Chinese Medicine, Nanjing, China; School of Chinese Materia Medica, Nanjing University of Chinese Medicine, Nanjing, China	Astragalus mongholicus Bunge and Curcuma aromatica Salisb. inhibits liver metastasis of colon cancer by regulating EMT via the CXCL8/CXCR2 axis and PI3K/AKT/mTOR signaling pathway	Chin. Med	14	10.1186/s13020-022-00641-4
2022	Patil V.S.; Varashree B.S.; Sreedhara Ranganath Pai K.; Hari G.; Priya K.	Department of Biochemistry, Kasturba Medical College, Manipal, Manipal Academy of Higher education (MAHE), Karnataka, Manipal, 576104, India; Department of Pharmacology, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education (MAHE), Karnataka, Manipal, 576104, India	Cytotoxic effects of Chloroform-methanol extract, protein extract and various fractions of ethanolic extract of Curcuma amada rhizome on HCT116 colon cancer cell line	Res. J. Pharm. Technol.	0	10.52711/0974-360X.2022.00833
2023	Nobari S.; Amini R.; Jalilian F.A.; Najafi R.; Bahreini F.	Molecular Medicine Research Center, Hamadan University of Medical Sciences, Hamadan, Iran; Department of Medical Virology, Faculty of Medicine, Hamadan University of Medical Sciences, Hamadan, Iran	Combination of Curcumin and Zerumbone Improves VEGF-A Inhibition in Colorectal Cancer In Vivo and In Vitro Model	Proc. Natl. Acad. Sci. India Sect. B - Biol. Sci.	1	10.1007/s40011-023-01486-z

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
2023	Gan Y.; Zhou L.; Wang R.; Zhang Y.; Li X.; Han S.; Rong P.; Wang W.; Li W.	Department of Radiology, The Third Xiangya Hospital of Central South University, Changsha, Hunan, 410013, China; Cell Transplantation and Gene Therapy Institute, The Third Xiangya Hospital of Central South University, Changsha, Hunan, 410013, China; Department of Pathology, National Clinical Research Center for Geriatric Disorders, Xiangya Hospital of Central South University, Changsha, Hunan, 410008, China	Curcumol Reduces Aerobic Glycolysis and Overcomes Chemoresistance by Inducing Cdh1-Mediated Skp2 Ubiquitination	Am. J. Chin. Med.	4	10.1142/S0192415X23500349
2023	Yoon D.; Choi B.-R.; Shin W.C.; Kim K.-W.; Lee Y.-S.; Lee D.Y.	Department of Herbal Crop Research, National Institute of Horticultural and Herbal Science, RDA, Chungbuk, Eumseong, 27709, South Korea	Metabolomics reveals that Curcuma longa and demethoxycurcumin inhibit HCT116 human colon cancer cell growth	Appl. Biol. Chem.	0	10.1186/s13765-023-00844-9
2023	Firouzjaei A.A.; Aghaee-Bakhtiari S.H.; Tafti A.; Sharifi K.; Abadi M.H.J.N.; Rezaei S.; Mohammadi-Yeganeh S.	Department of Medical Biotechnology, School of Advanced Technologies in Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran; Department of Medical Biotechnology and Nanotechnology, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran; Bioinformatics Research Group, Mashhad University of Medical Sciences, Mashhad, Iran; Department of Biotechnology and Molecular Medicine, Faculty of Medicine, Arak University of Medical Sciences, Arak, Iran; Medical Nanothechnology and Tissue Engineering Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran	Impact of curcumin on ferroptosis-related genes in colorectal cancer: Insights from in-silico and in-vitro studies	Cell Biochem. Funct.	3	10.1002/cbf.3889
2023	Wan C.; Ma Q.; Anderson S.; Zhang Q.-H.; Zhang C.-F.; Wang A.H.; Bell E.; Hou L.; Yuan C.-S.; Wang C.-Z.	Central Laboratory, No. 1, Affiliated Hospital of Yunnan University of Traditional Chinese Medicine, Kunming, 650021, China; Tang Center for Herbal Medicine Research and Department of Anesthesia and Critical Care, University of Chicago, Chicago, 60637, IL, United States; Key Laboratory of Modern Preparation of Tcm of Ministry of Education, Jiangxi University of Traditional Chinese Medicine, Nanchang, 330004, China; School of Chemistry and Chemical Engineering, Chongqing University, Chongqing, 400044, China; School of Traditional Chinese Pharmacy, China Pharmaceutical University, Jiangsu, Nanjing, 210009, China; Program in Cellular and Molecular Medicine, Boston Children's Hospital, Department of Pediatrics, Harvard Medical School, Boston, 02115, MA, United States	Effects of Curcuminoids and Surfactant-Formulated Curcumin on Chemo-Resistant Colorectal Cancer	Am. J. Chin. Med.	1	10.1142/S0192415X23500714

Year	Authors	Affiliations	Title	Abbreviated Source Title	Cited by	DOI
2023	Liang Z.Q.; Bian Y.; Gu J.F.; Yin G.; Sun R.L.; Liang Y.; Wan L.L.; Yin Q.H.; Wang X.; Gao J.; Zhao F.; Tang D.C.	School of Chinese Medicine, School of Integrated Chinese and Western Medicine, Nanjing University of Chinese Medicine, Jiangsu, Nanjing, 210023, China; Laboratory Animal Center, Nanjing University of Chinese Medicine, Jiangsu, Nanjing, 210023, China; School of Acupuncture and Tuina, School of Health and Rehabilitation, Nanjing University of Chinese Medicine, Jiangsu, Nanjing, 210046, China	Exploring the anti-metastatic effects of Astragalus mongholicus Bunge-Curcuma aromatica Salisb. on colorectal cancer: A network-based metabolomics and pharmacology approach	Phytomedicine	5	10.1016/j.phymed.2023.154772
2023	Jain A.; Jain P.; Soni P.; Tiwari A.; Tiwari S.P.	Department of Biotechnology, Shri Shankaracharya Mahavidyalaya, Junwani, Bhilai, 490020, India; Department of Pharmacology, Chhattrapati Shivaji Institute of Pharmacy, Durg, 491001, India; Department of Pharmacy, Indira Gandhi National Tribal University, M.P., Amarkantak, 484887, India; Faculty of Pharmacy, Kalinga University, Chhattisgarh, Raipur, 492101, India	Design and Characterization of Silver Nanoparticles of Different Species of Curcuma in the Treatment of Cancer Using Human Colon Cancer Cell Line (HT-29)	J. Gastrointest. Cancer	11	10.1007/s12029-021-00788-7
2023	Ejaz S.A.; Aziz M.; Fawzy Ramadan M.; Fayyaz A.; Bilal M.S.	Department of Pharmaceutical Chemistry, Faculty of Pharmacy, The Islamia University of Bahawalpur, Bahawalpur, 63100, Pakistan; Department of Clinical Nutrition, Faculty of Applied Medical Sciences, Umm Al-Qura University, Makkah, 21955, Saudi Arabia	Pharmacophore-Based Virtual Screening and In-Silico Explorations of Biomolecules (Curcumin Derivatives) of Curcuma longa as Potential Lead Inhibitors of ERBB and VEGFR-2 for the Treatment of Colorectal Cancer	Molecules	4	10.3390/molecules28104044
2023	Adebayo-Gege G.; Ejembi S.A.; Umedum N.L.; Mayowa O.S.; Ojo O.A.; Danjuma I.M.; Obialor A.; Johnson G.I.; Adegboyega A.E.; Johnson T.O.	Department of Human Physiology, Faculty of Basic Medical Sciences, Baze University, Jabi, Abuja, Nigeria; Department of Biochemistry, Faculty of Basic Medical Sciences, University of Jos, Jos, Nigeria; Department of Pure and Industrial Chemistry, Nnamdi Azikiwe University, Awka, Nigeria; Biochemistry Department, University of Ilorin, Nigeria; Phytomedicine, Molecular Toxicology, and Computational Biochemistry Research Laboratory (PMTCB-RL), Department of Biochemistry, Bowen University, Iwo, 232101, Nigeria; Department of Biochemistry, Ahmadu Bello University, Zaria, Nigeria; Department of Zoology, University of Jos, Nigeria; College of Health Sciences, University of Jos, Jos, Nigeria; Jaris Computational Biology Center, Jos, Nigeria	Molecular modeling of the interactions of Curcuma longa compounds with VEGFR towards colorectal cancer drug development	Inform. Med. Unlocked	1	10.1016/j.imu.2023.101376