Pharma Nord
Academy

Curcumin in Clinical Practice

Webinar - 18th November 2025

Today's Speaker

Lorraine Nicolle

MSc (Nutr.), PGCHE, BA (hons),
Dip. CIM, Dip. BCNH

- Education Lead, Pharma Nord UK
- Registered Nutritionist (MBANT) and Nutritional Therapist (CNHC)
- Functional Medicine and Healthy Ageing Specialist
- In clinical practice for 22 years
- Higher education teacher (nutrition science & practice)
- Author/editor of several nutrition books
- Accredited clinical supervisor and mentor for nutrition practitioners

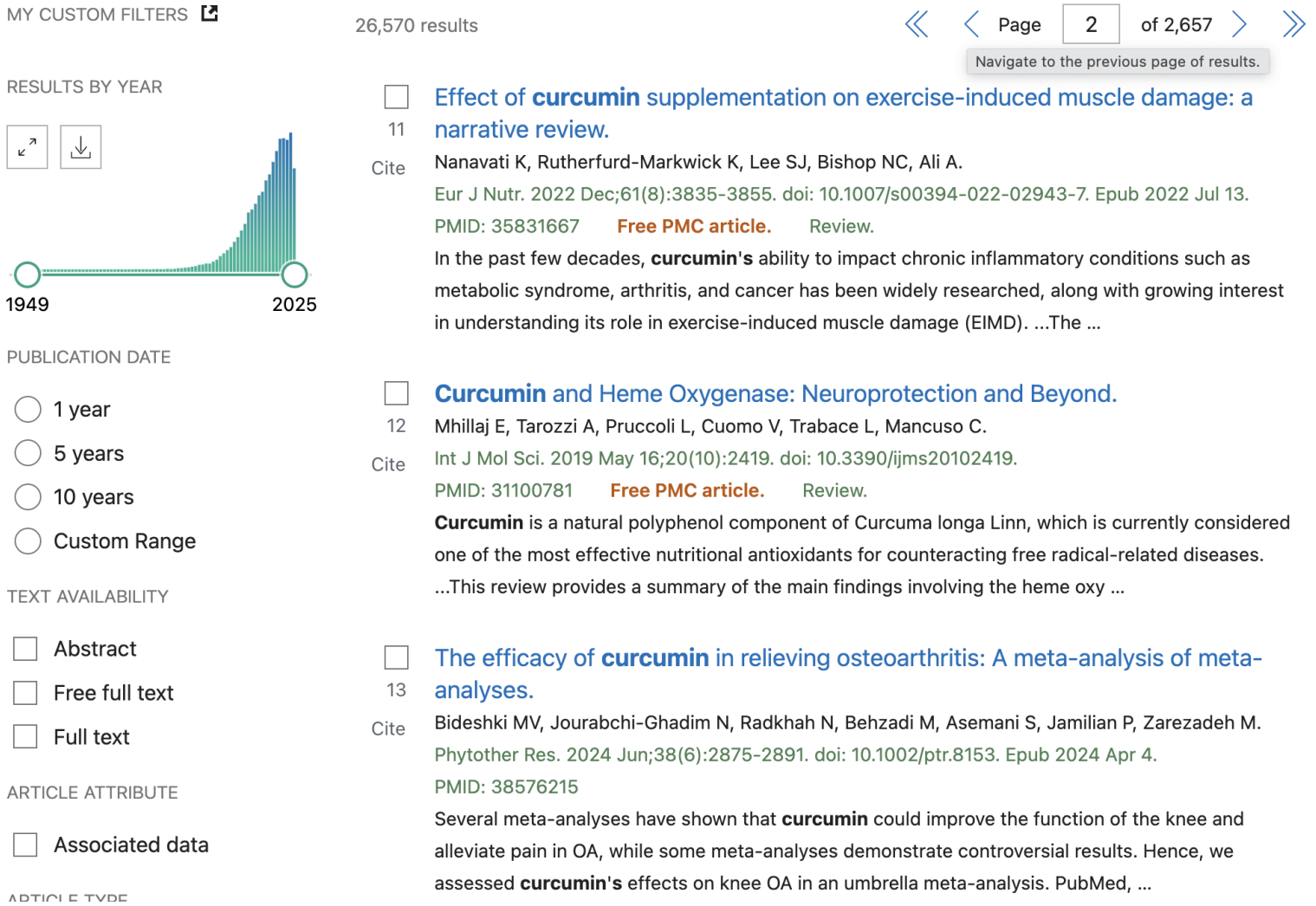
Pharma Nord Academy

Learning outcomes for today

1. What is curcumin and its role in human health?
2. Problems/limitations with interpreting the evidence
3. Improving curcumin's absorption and half life in humans with Bio-Curcumin (Longvida)
4. Evidence for Longvida from human trials
5. Safety

One of the most well-researched nutraceuticals in human health

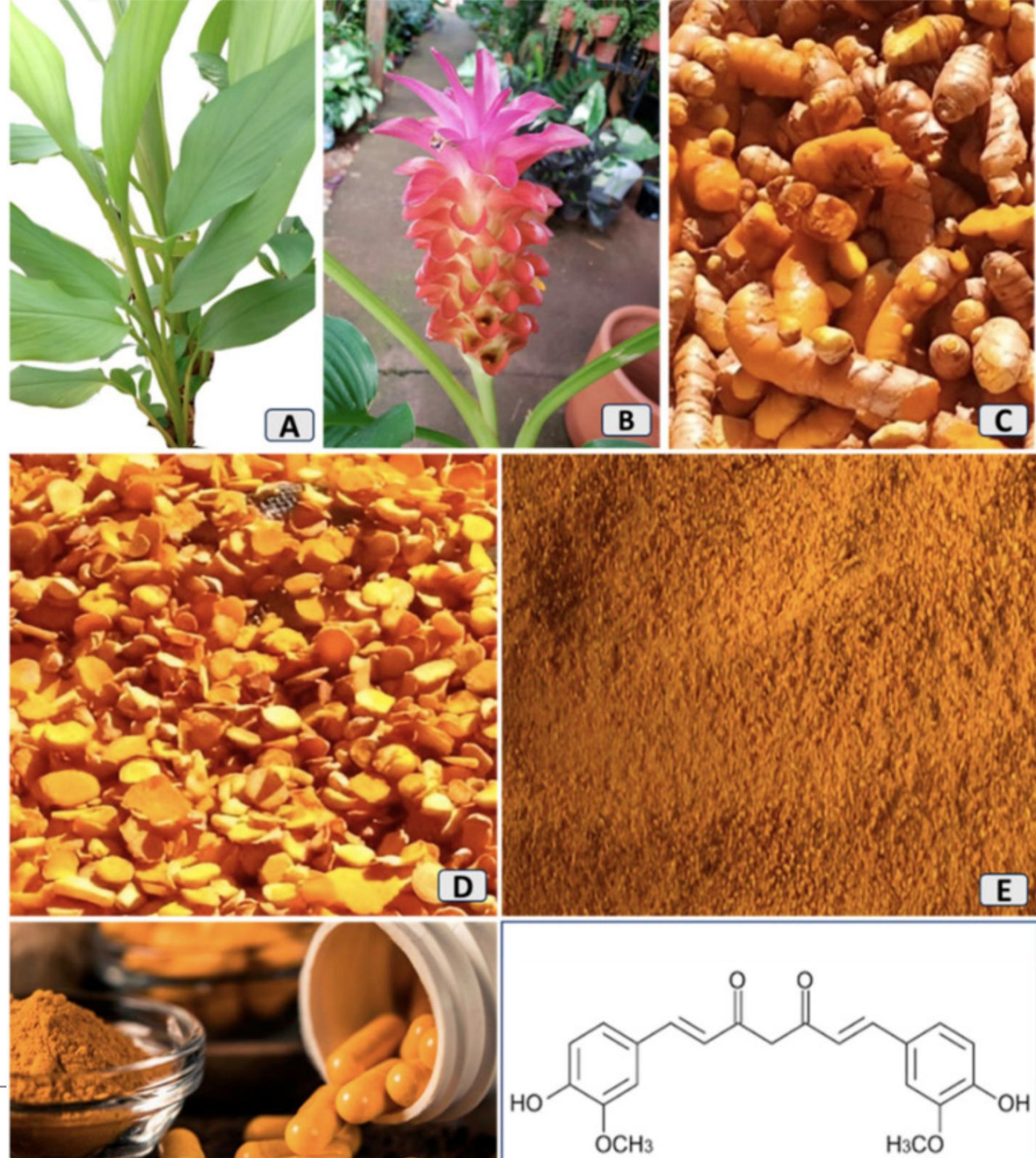
- More than 26,000 studies on Pubmed
- Almost 2,000 in 2025 alone
- 231 clinical trials within the last 5 years



Pharma Nord Academy

The main parts of the *Curcuma longa* plant

(**A**) leaves
(**B**) flower
(**C**) rhizomes
(**D**) sliced rhizomes
(**E**) rhizome powder
(**F**) nutraceutical formulation, and
(**G**) curcumin molecular structure



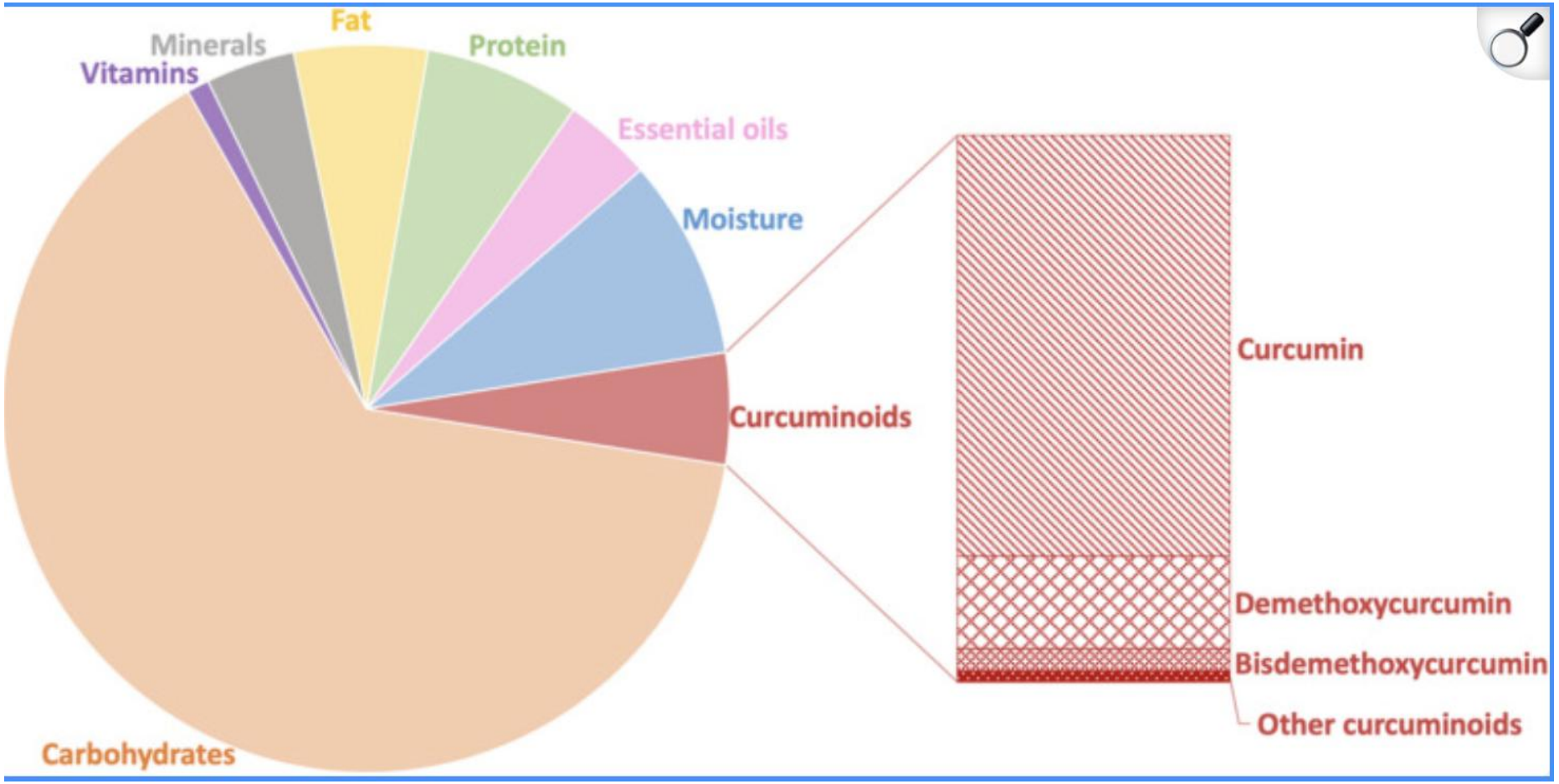
The curcumin longa plant

- An upright tropical herbaceous perennial, part of the ginger family
- Found in the humid climates of Indian subcontinent and Southeast Asia
- Turmeric is a yellow/orange pigment from the long rhizome and has been used since ancient times as a dye, a culinary spice and to treat chronic diseases especially in Ayurvedic and traditional Chinese medicine

- Turmeric contains up to **50 curcuminoids** (bioactive phenolic compounds)
- **The 3 major ones**:
  - curcumin (77%),
  - demethoxycurcumin (17%)
  - bisdemethoxycurcumin (3-6%)

Zhang HA, Kitts DD. Turmeric and its bioactive constituents trigger cell signaling mechanisms that protect against diabetes and cardiovascular diseases. Mol Cell Biochem. 2021 Oct;476(10):3785-3814.

The main constituents of turmeric root



Zhang HA, Kitts DD. Turmeric and its bioactive constituents trigger cell signaling mechanisms that protect against diabetes and cardiovascular diseases. Mol Cell Biochem. 2021 Oct;476(10):3785-3814.

Pharma Nord Academy

Therapeutic Potential of Curcumin

One of the most well-researched nutraceuticals in human health

In vitro & in vivo studies show evidence for the following effects:

- antioxidant
- immunomodulatory
- anti-inflammatory
- anti-microbial
- cardio-protective
- nephro-protective
- hepato-protective
- Anti-amyloid accumulation
- anti-neoplastic
- anti-rheumatic
- insulin sensitising

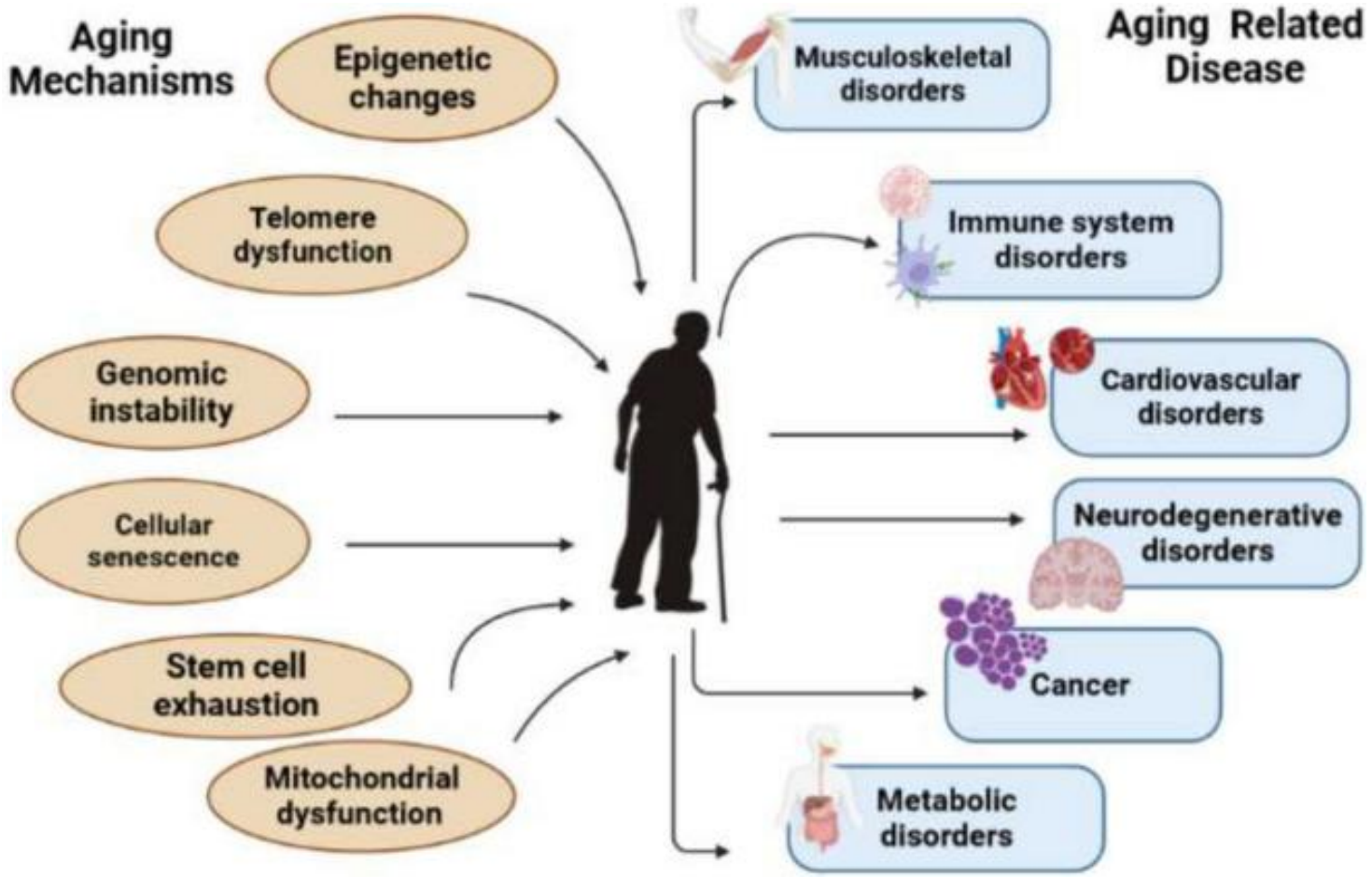
Vaiserman, A.M., Koliada, A., Zayachkivska, A., & Lushchak, O. (2020). Curcumin: A therapeutic potential in ageing-related disorders. *PharmaNutrition, 14*, 100226.

Summary of the **main areas of evidence**

With some brief examples of human trial data

Attenuates many of the hallmarks of ageing

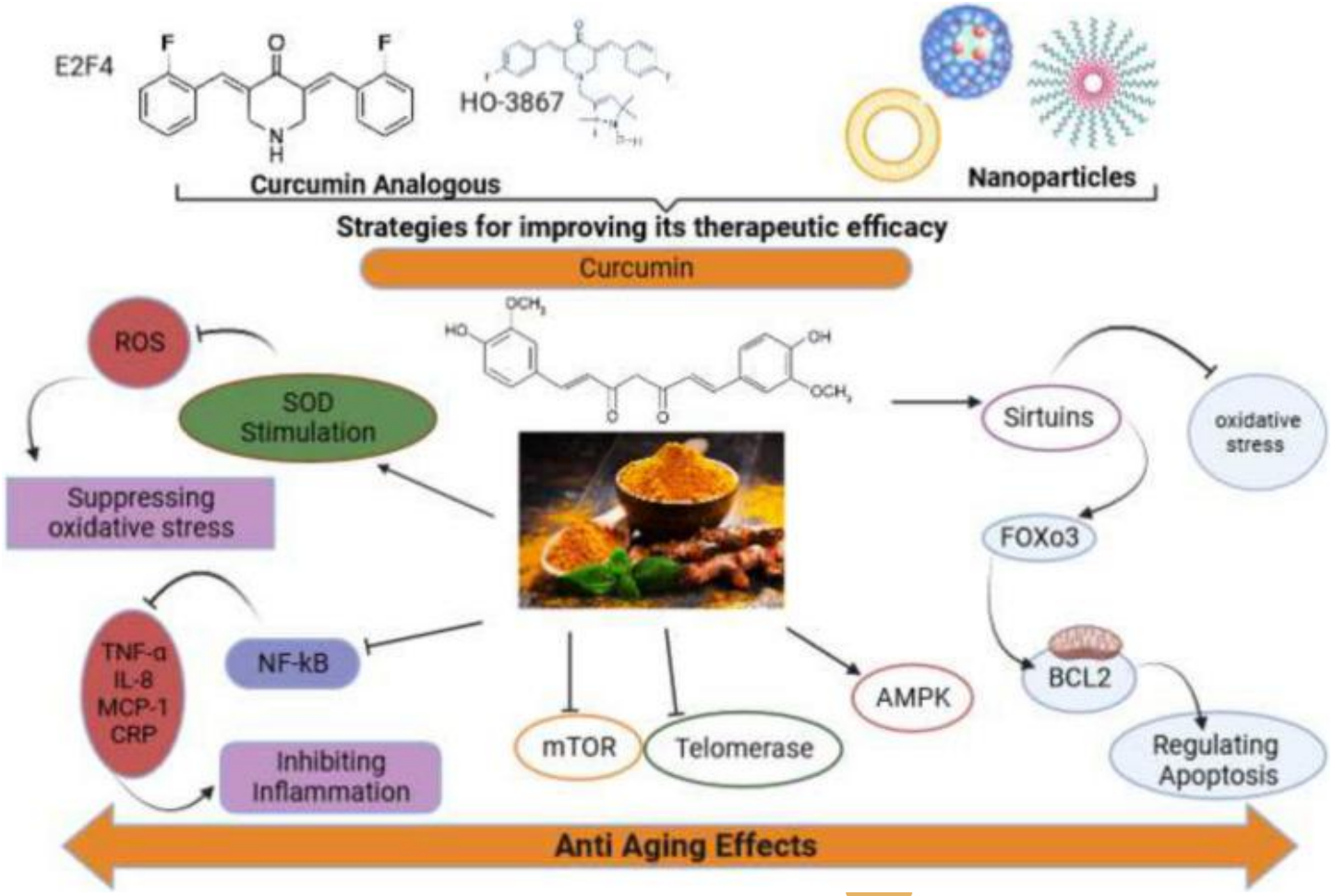
(2024 review)



Izadi M, Sadri N, Abdi A, et al. Longevity and anti-aging effects of curcumin supplementation. Geroscience. 2024 Jun;46(3):2933-2950

Pleiotropic mechanisms on the ageing process

Changes levels of key proteins involved in the ageing process, such as sirtuins and AMPK, and inhibits pro-ageing proteins, such as NF-κB and mTOR: this brings all the other effects listed earlier



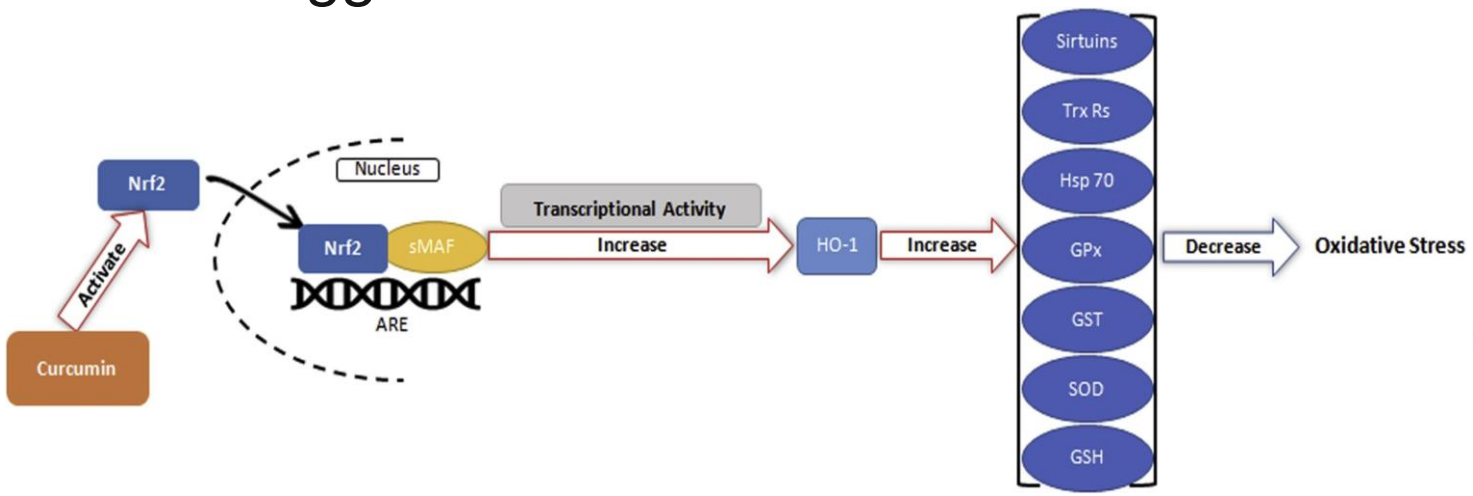
Izadi M, Sadri N, Abdi A, et al. Longevity and anti-aging effects of curcumin supplementation. Geroscience. 2024 Jun;46(3):2933-2950

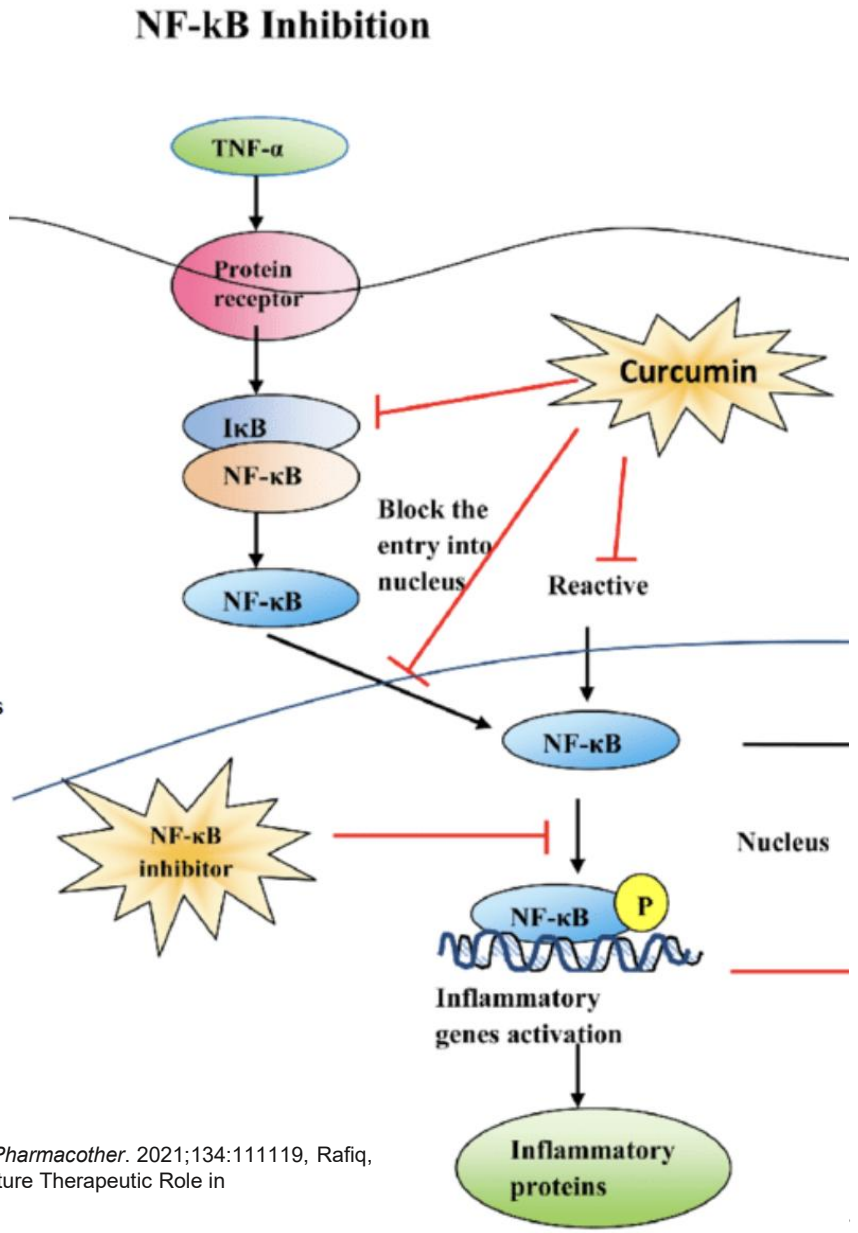
Pharma Nord Academy

Epigenetic example:

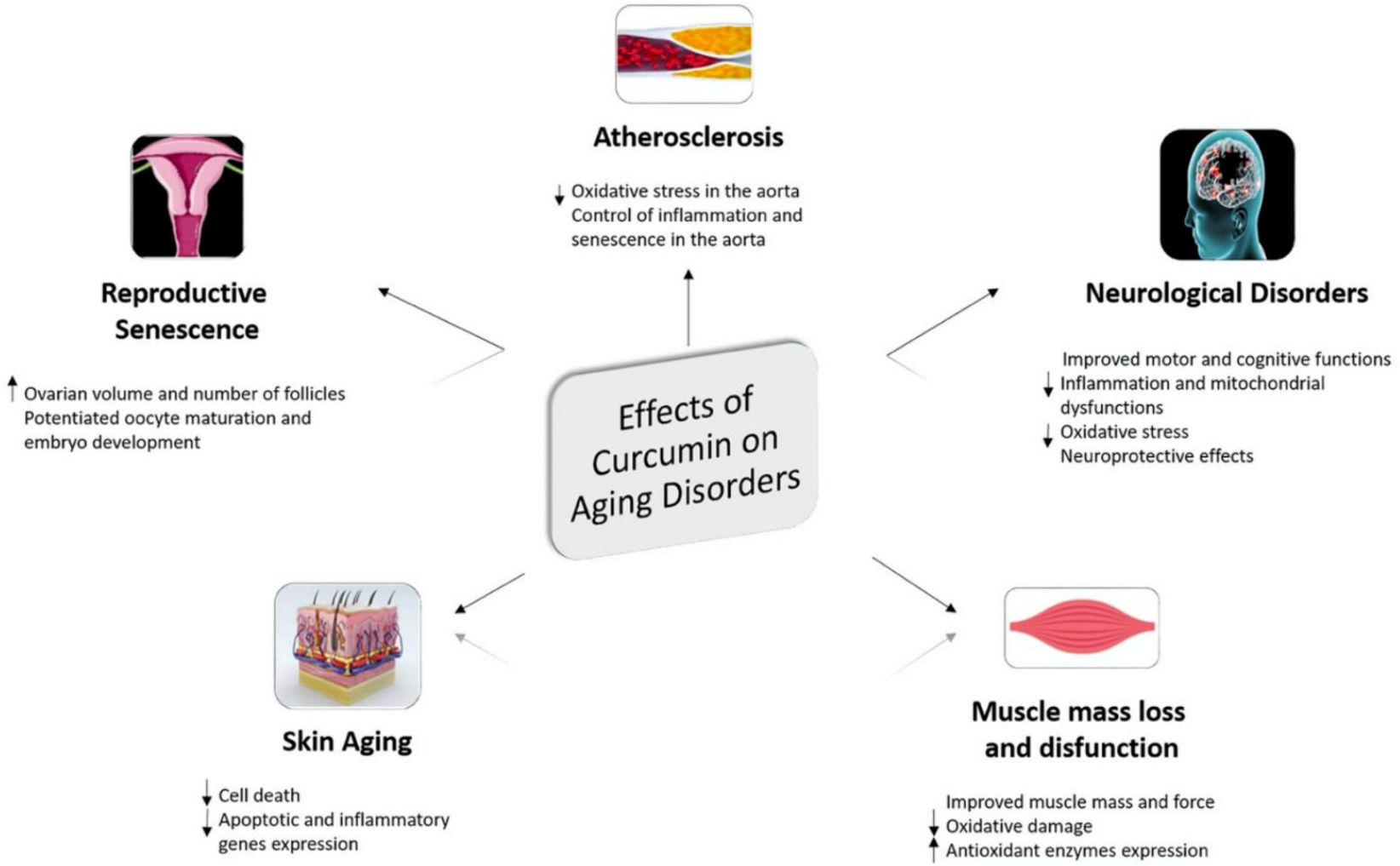
- Blocks NF-kB getting into the cell

- And triggers NrF2





Zia A, Farkhondeh T, Pourbagher-Shahri AM, Samarghandian S. The role of curcumin in aging and senescence: Molecular mechanisms. *Biomed Pharmacother*. 2021;134:111119, Rafiq, S. , Raza, M. , Younas, M. , Naeem, F. , Adeeb, R. , Iqbal, J. , Anwar, P. , Sajid, U. and Manzoor, H. (2018) Molecular Targets of Curcumin and Future Therapeutic Role in Leukemia. *Journal of Biosciences and Medicines*, **6**, 33-50.

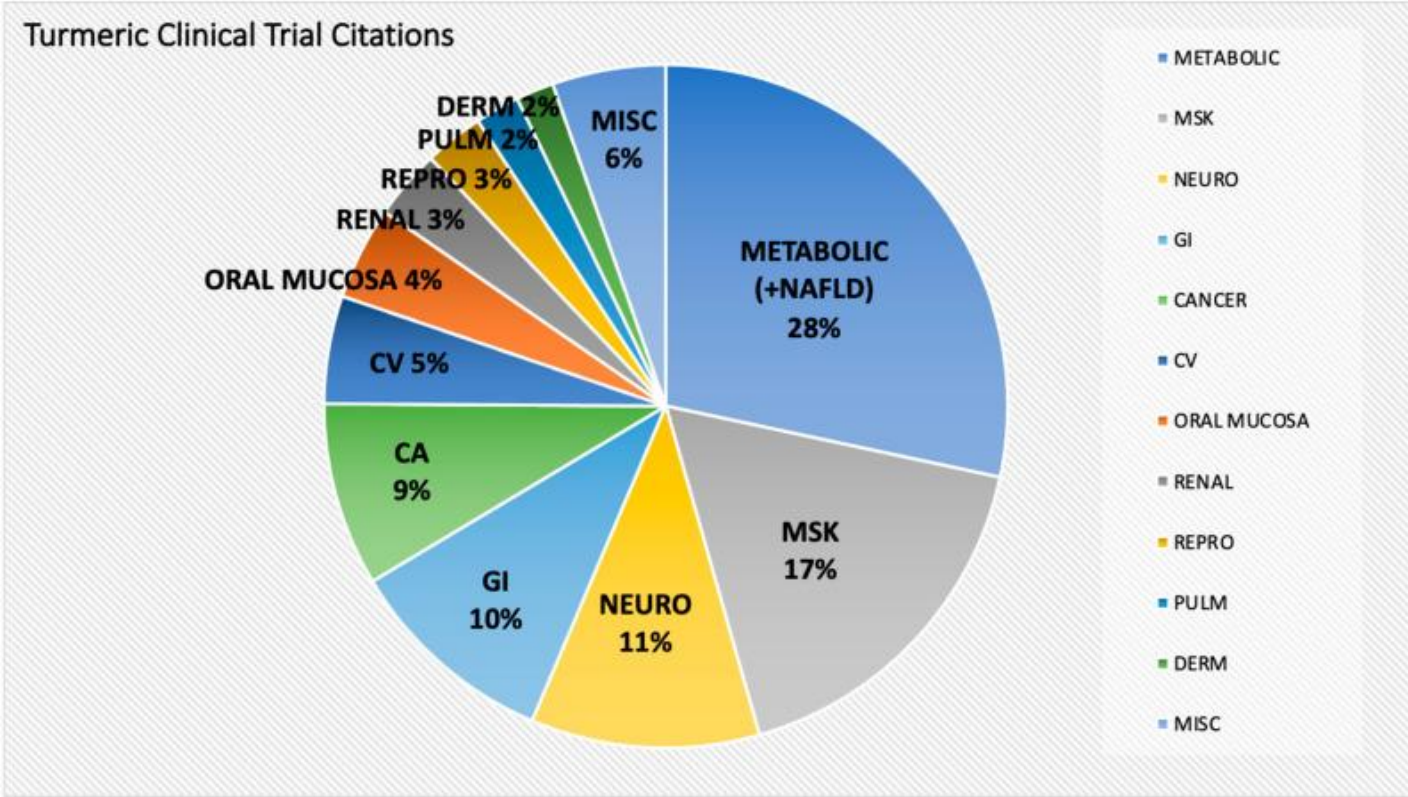


These **mechanisms translate into effects** on common ageing disorders

Cianciulli A, et al., Inflammaging and Brain: Curcumin and Its Beneficial Potential as Regulator of Microglia Activation. *Molecules*. 2022;27(2):341. doi:10.3390/molecules27020341

Scoping review of *human trials* on curcumin

- **389 curcumin clinical trials** had diseases of ageing as their primary focus
- Beneficial effects on clinical outcomes &/or biomarkers reported in 75% citations
- Primarily (77%) double-blind, randomized, placebo-controlled trials
- Metabolic and musculoskeletal trials predominant



Panknin TM, Howe CL, Hauer M, Bucchireddigari B, Rossi AM, Funk JL. Curcumin Supplementation and Human Disease: A Scoping Review of Clinical Trials. *Int J Mol Sci*. 2023;24(5):4476. Published 2023 Feb 24. doi:10.3390/ijms24054476

Pharma Nord Academy

Examples of the human trial data on some of the chronic conditions mentioned above

Cognition and brain function

Pharma Nord Academy

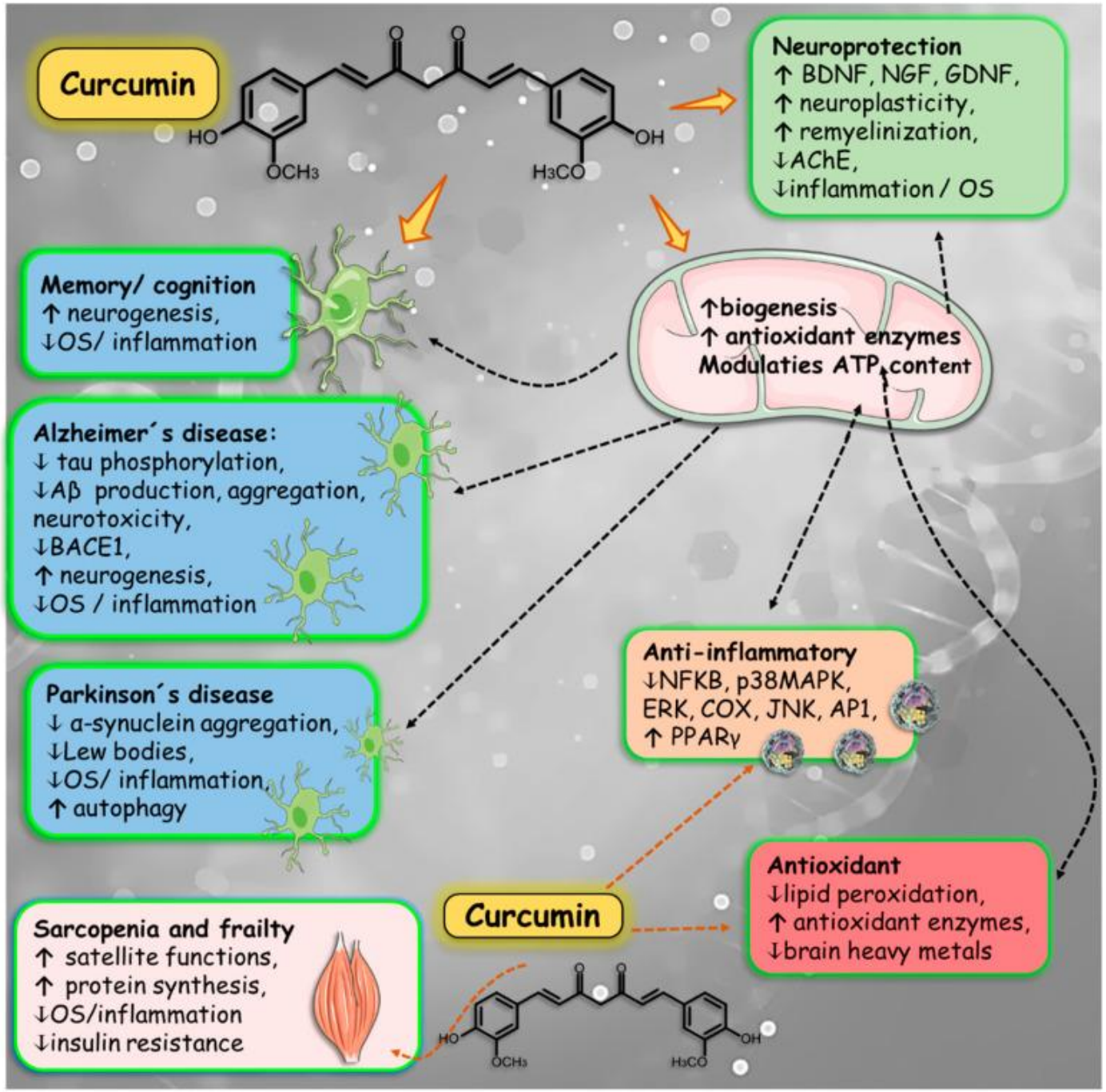
2024 systematic review on neurocognitive disorders

12 studies of adults with & without neurocognitive disorders

Conclusion: Curcumin significantly improves working memory in the following adult groups:

- Non-demented
- Metabolically impaired
- Cognitively impaired
- Mood impaired
- Chemotherapy impaired

Francis AJ, Sreenivasan C, Parikh A, et al. Curcumin and Cognitive Function: A Systematic Review of the Effects of Curcumin on Adults With and Without Neurocognitive Disorders. *Cureus*. 2024;16(8):e67706



Curcumin for Nervous System Disorders

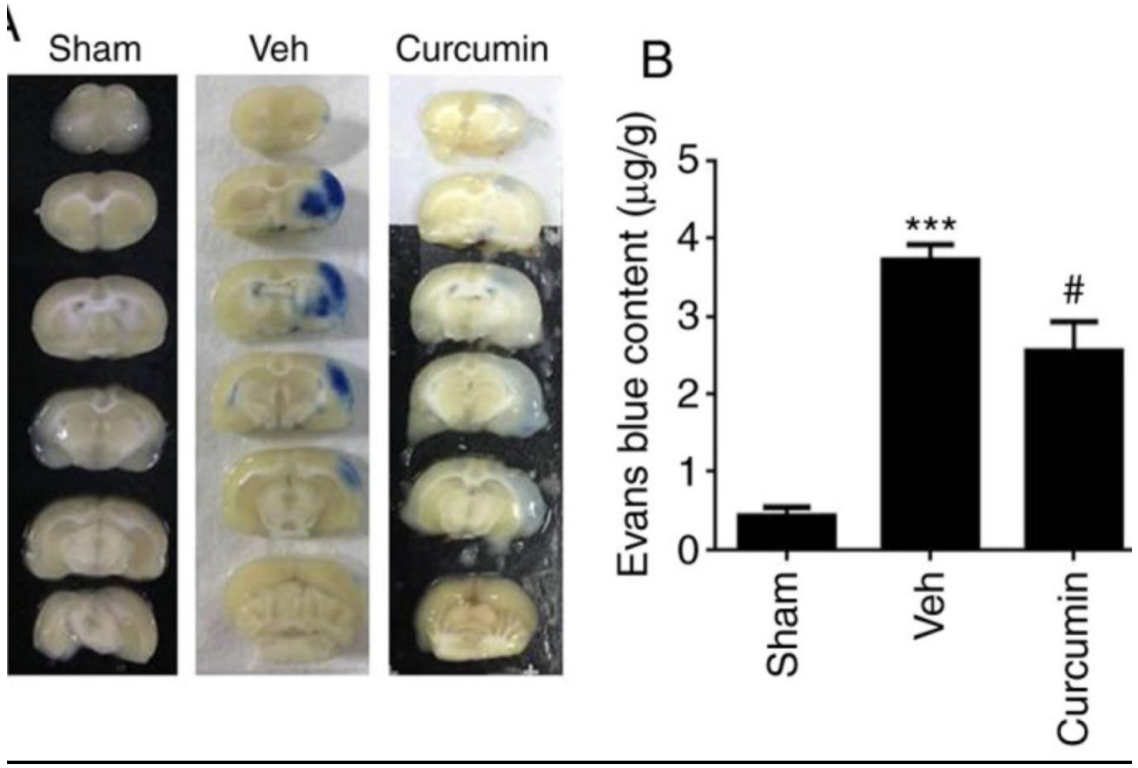
Several *mechanisms* found in studies that stimulate autophagy and reduce beta-amyloid deposition, neuroinflammation and oxidation

Nunes YC, Mendes NM, Pereira de Lima E, et al. Curcumin: A Golden Approach to Healthy Aging: A Systematic Review of the Evidence. *Nutrients*. 2024;16(16):2721.

Pharma Nord Academy

Curcumin for the BBB

- Data from many animal studies show curcumin pre-treatment to attenuate BBB disruption induced by ischemia reperfusion brain injury
- Typically measured by leakage of ‘Evans’ blue dye
- Hard to design an ethical such study in humans



‘Veh’: showing leakage of the blue dye following injury

Yuan J, Liu W, Zhu H, Zhang X, Feng Y, Chen Y, Feng H, Lin J. Curcumin attenuates blood-brain barrier disruption after subarachnoid hemorrhage in mice. J Surg Res. 2017 Jan;207:85-91, Wu S, Guo T, Qi W, Li Y, Gu J, Liu C, Sha Y, Yang B, Hu S, Zong X. Curcumin ameliorates ischemic stroke injury in rats by protecting the integrity of the blood-brain barrier. Exp Ther Med. 2021 Jul;22(1):783.

Pharma Nord Academy

Musculoskeletal health

Pharma Nord Academy

Most recent review

- Curcumin's effects on knee OA in a 2024 *meta-analysis of meta-analyses* (as there have been so many!) of RCTs: 11 meta-analyses in total
- Outcome measures: VAS & WOMAC scales

Results:

- Curcumin could significantly decrease the VAS score, WOMAC-total, WOMAC-Function, WOMAC-Pain, and WOMAC-Stiffness scores

*'The results strongly support **curcuminoid supplementation** in relieving pain, improving joint mobility & stiffness, and shortening medication usage of OA patients'*

Bideshki MV, Jourabchi-Ghadim N, Radkhah N, et al. The efficacy of curcumin in relieving osteoarthritis: A meta-analysis of meta-analyses. Phytother Res. 2024 Jun;38(6):2875-2891.

Example of one of the meta-analyses

Remember curcumin's anti-inflammatory mechanism: triggers NrF2 and inhibits NF-kB and therefore, reduces inflammatory cytokine release

Study: 2021 meta-analysis of 15 trials, 1621 participants: Curcumin in the management of OA

Findings: Compared with non-steroidal anti-inflammatory drugs (NSAIDs), curcuma longa extract/curcumin supplements have similar effects on:

- Joint pain
- Joint function/Mobility
- Stiffness

Safety profile: side-effects of the curcumin groups were lower in terms of adverse events

Zeng L, Yu G, Hao W, Yang K, Chen H. The efficacy and safety of Curcuma longa extract and curcumin supplements on osteoarthritis: a systematic review and meta-analysis. Biosci Rep. 2021;41(6):BSR20210817. doi:10.1042/BSR20210817

What about *rheumatoid* arthritis?

2020 systematic review of 6 studies (259 patients with RA of 6-12 weeks duration):

- Curcumin significantly reduced disease activity scores (DAS28) in 4 out of 5 studies, and pain in all 3 studies that measured pain
- Blood inflammatory markers ESR & CRP and rheumatoid factor were reduced in relevant studies

A later review (2023) of 6 RCTs (N = 539) showed similar results in symptoms and disease activity biomarkers:

- ESR, DAS28, swollen joint count and tender joint count

Adv Exp Med Biol. 2021;1291:251-263, Kou H, Huang L, Jin M, He Q, Zhang R, Ma J. Effect of curcumin on rheumatoid arthritis: a systematic review and meta-analysis. Front Immunol. 2023 May 31;14:1121655.

Other auto-immune

2022 systematic review & meta-analysis of 31 RCTs reported:

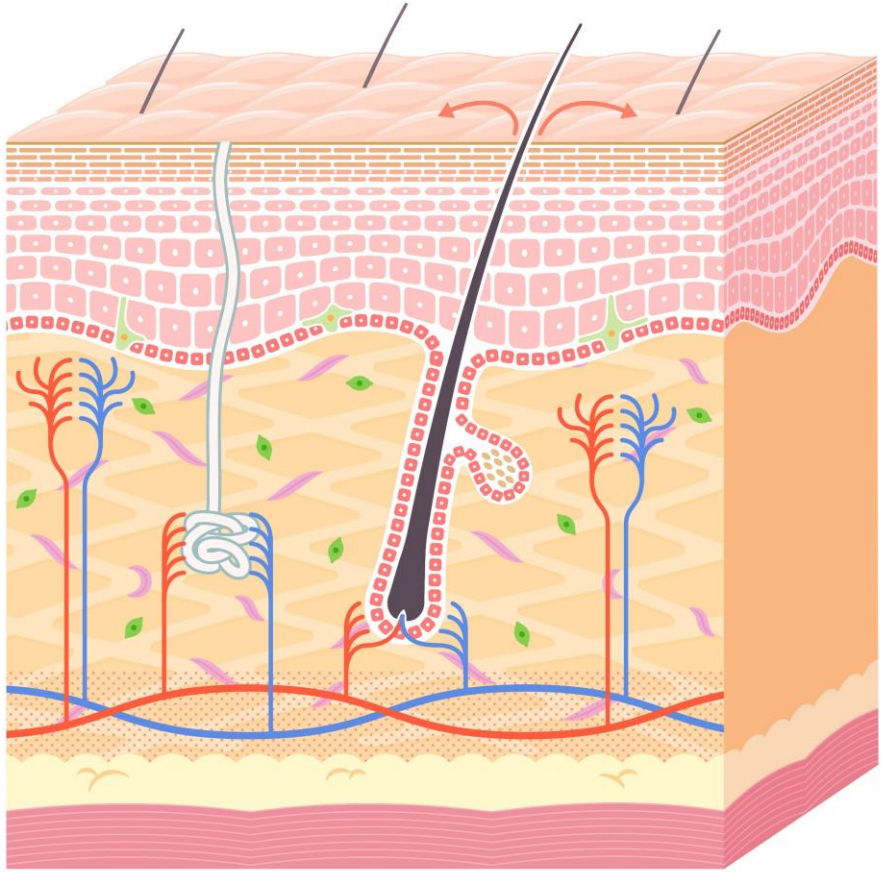
- Curcumin & turmeric extract reduce sxs in a wide range of AID
- Particularly strong data for use in psoriasis, UC & RA

- Standardized curcumin useful where inflammation is within GI tract
  - UC, Crohn's, Coeliac
- Where GI absorption is crucial (for systemic inflammation such as RA or SLE), curcumin modified for optimal absorption may have more efficacy

Front Immunol. 2022 Aug 1;13:896476

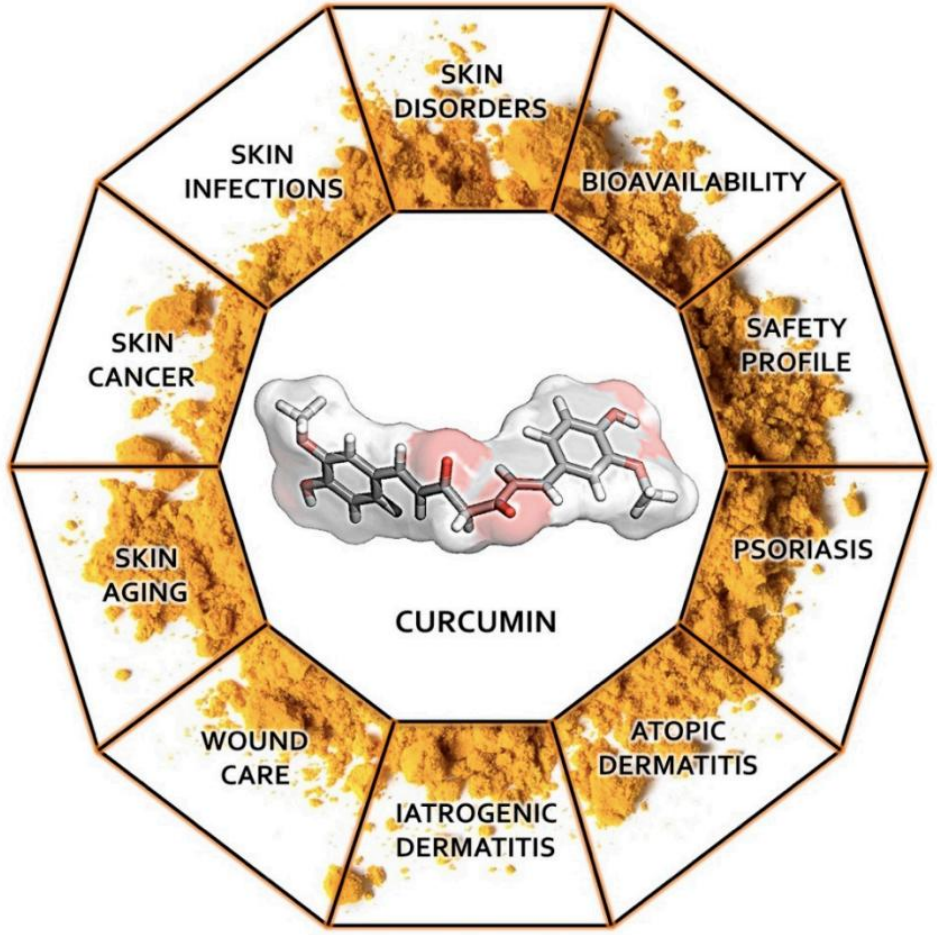
J Ag Food Chem. 2010. 58(4): 2095-2099

Skin health



Curcumin in skin health

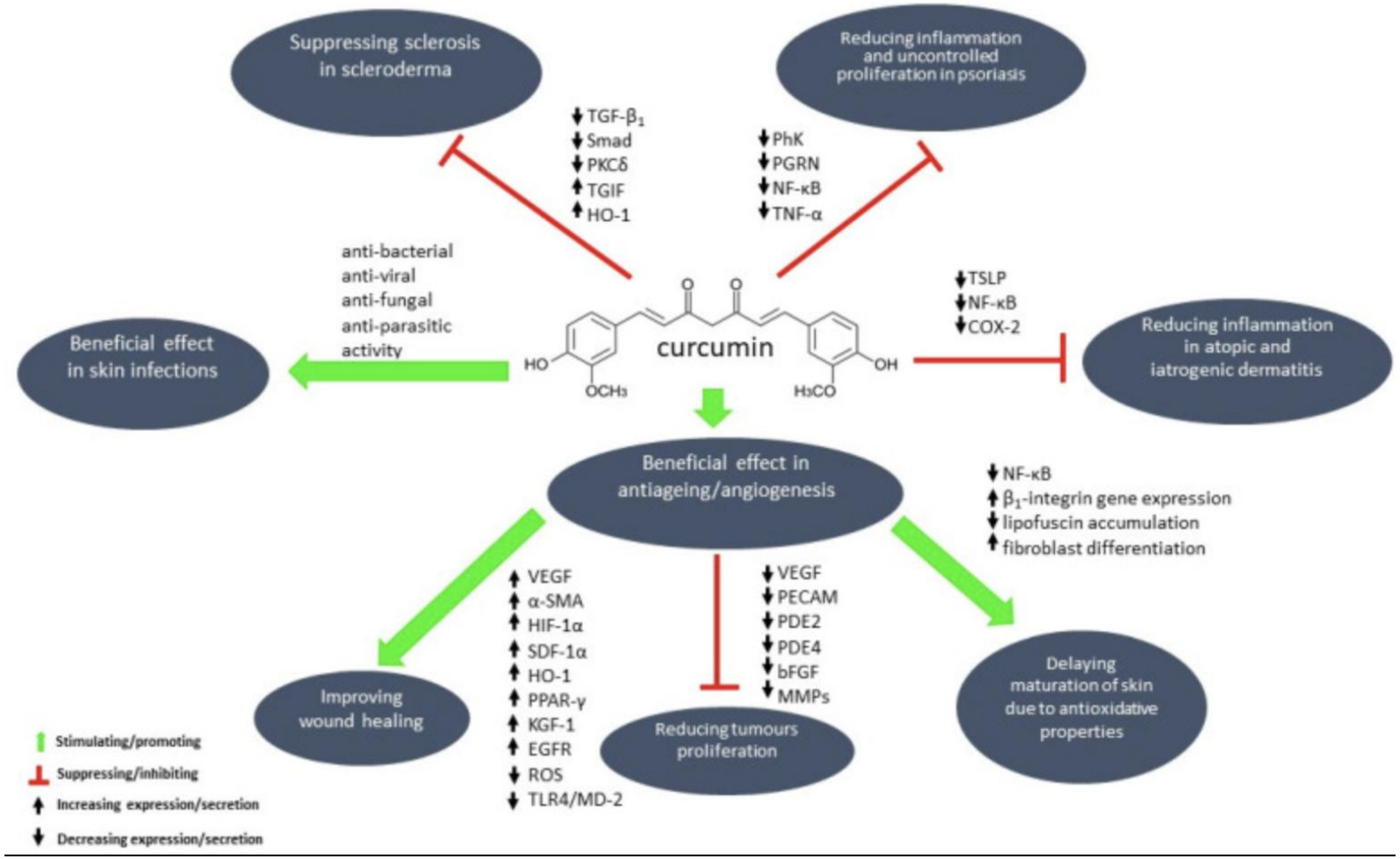
- Widely studied in skin health: 1,158 results on Pubmed
- Systematic review of curcumin supps. on acne, alopecia, atopic dermatitis, facial photoaging, oral lichen planus, pruritus, psoriasis, radiodermatitis and vitiligo
  - Conclude overall improvement in disease severity in the curcumin treatment groups
- Limitation is poor bioavailability – call for more use of delivery systems



Vaughn AR, Branum A, Sivamani RK. Effects of Turmeric (Curcuma longa) on Skin Health: A Systematic Review of the Clinical Evidence. *Phytother Res*. 2016;30(8):1243-1264.
Vollono L, et al. Potential of Curcumin in Skin Disorders. Nutrients. 2019 Sep 10;11(9):2169.

Mechanisms of curcumin in skin diseases

Anti-inflammatory, antiviral, antimutagenic, and antifungal effects. Protection against UVB radiation. Reduces wound healing times and improves collagen deposition



Kasprzak-Drozd K, Niziński P, Hawrył A, Gancarz M, Hawrył D, Oliwa W, Pałka M, Markowska J, Oniszczuk A. Potential of Curcumin in the Management of Skin Diseases. Int J Mol Sci. 2024 Mar 23;25(7):3617.

Allergies

Reported in a 2022 review to have a positive effect in several types of allergic conditions due to its modulatory impact on the innate and adaptive immune systems

Disease	Population size (N)	curcumin of *Curcuma longa L*	Duration of treatment	Results	Ref.
Dermatitis		1 g/day	4 weeks	- Reduce the pruritus severity - Reduce the level of substance P.[73]	[73]
Allergic rhinitis	241	500 mg/day	Two months	- Increase production of IL-10. - Decrease the production of TNF-α, IL-8, and IL-4.[130]	[130]
Asthma	34	30 mg/kg/day	6 months	- Better control of the disaese.[131]	[131]
Asthma	15	2000 mg/day	–	- Had no significant effects on the total white blood cell count, blood eosinophils, and the serum IgE.[132]	[132]
Asthma	60	500 mg/day	One month	- Decrease the total blood leukocytes. - Reduce the neutrophil and eosinophil count. - Decrease the lymphocyte count.[133]	[133]
Asthma	30	3000 mg/day	12 weeks	- Ongoing[134]	[134]
Eczema	150	–	4 weeks	- Improve the clinical symptoms of disease including, erythema, scaling, thickening, and	[135]

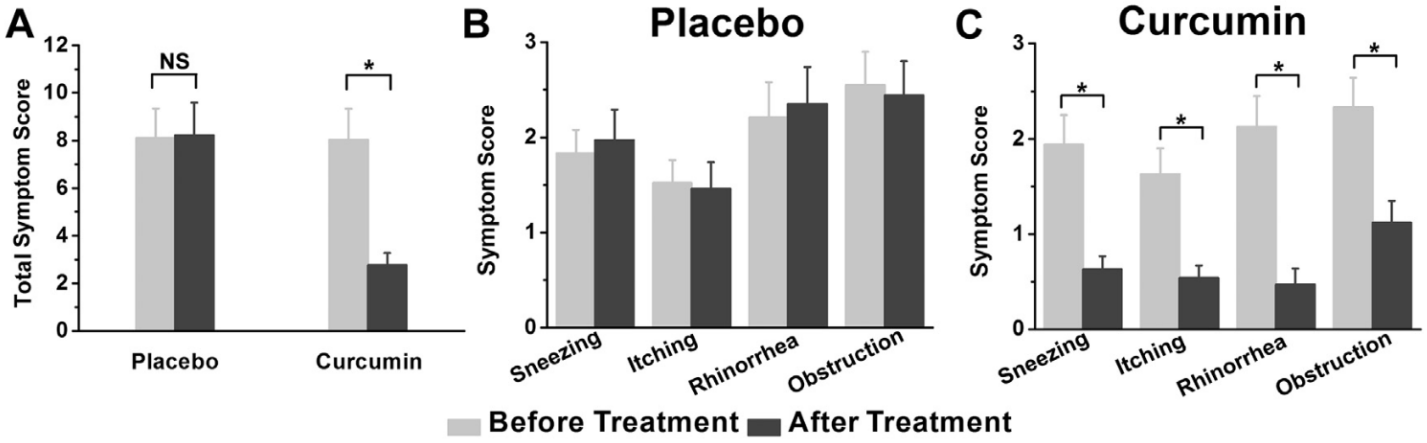
Haftcheshmeh SM, et al. Therapeutic potency of curcumin for allergic diseases: A focus on immunomodulatory actions. *Biomed Pharmacother*. 2022;154:113646. doi:10.1016/j.biopha.2022.113646

Example: allergic rhinitis

DBRCT of 241 patients with AR received either placebo or oral curcumin (500mg/day) for 2 months

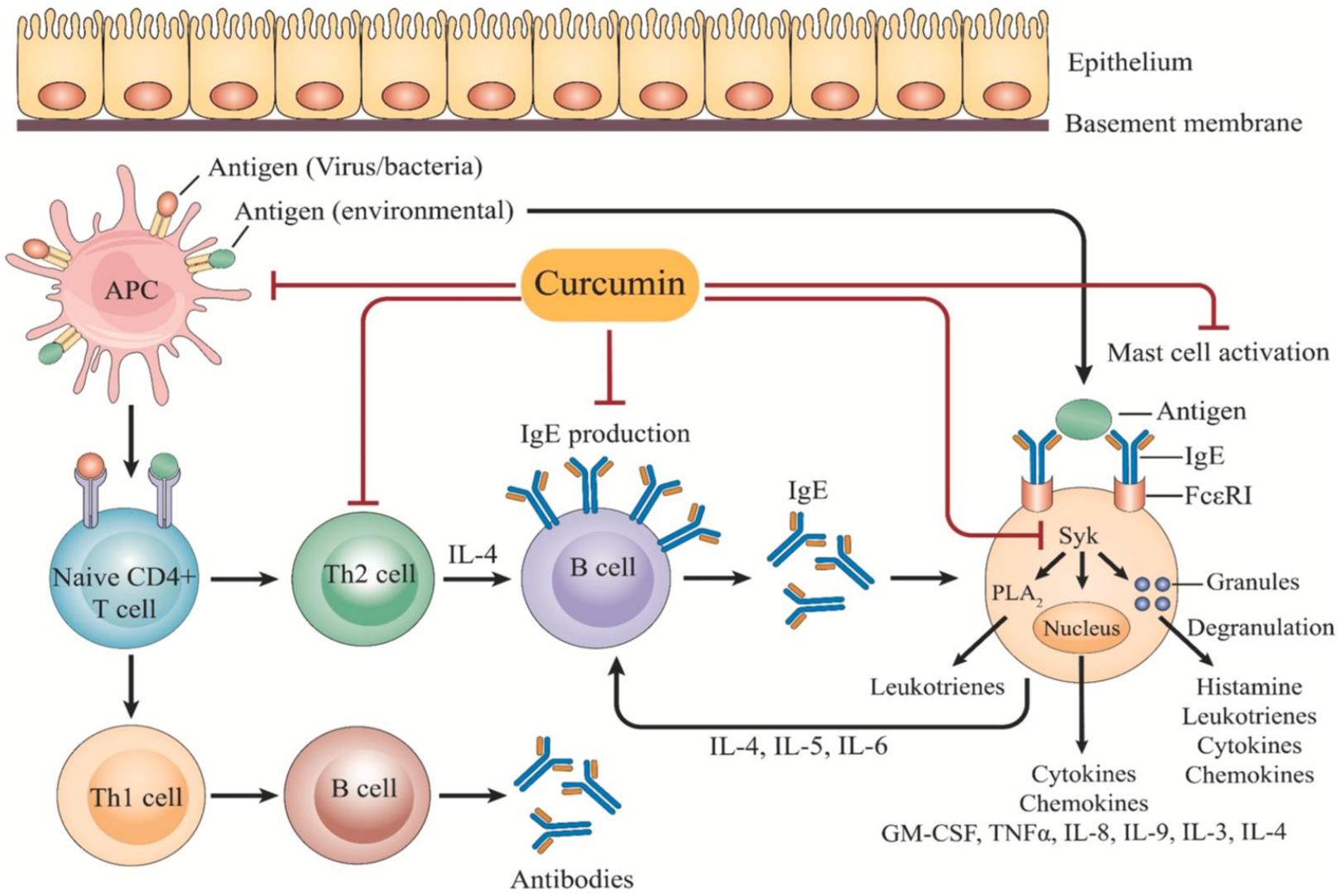
Results:

- Curcumin alleviated nasal symptoms (sneezing and rhinorrhea) and nasal congestion through reduction of nasal airflow resistance
- Immune cytokines (e.g. IL-4, IL-10 and TNF-a) were modulated in a helpful way



Wu S, Xiao D. Effect of curcumin on nasal symptoms and airflow in patients with perennial allergic rhinitis. *Ann Allergy Asthma Immunol*. 2016;117(6):697-702.e1. doi:10.1016/j.anai.2016.09.427

Curcumin

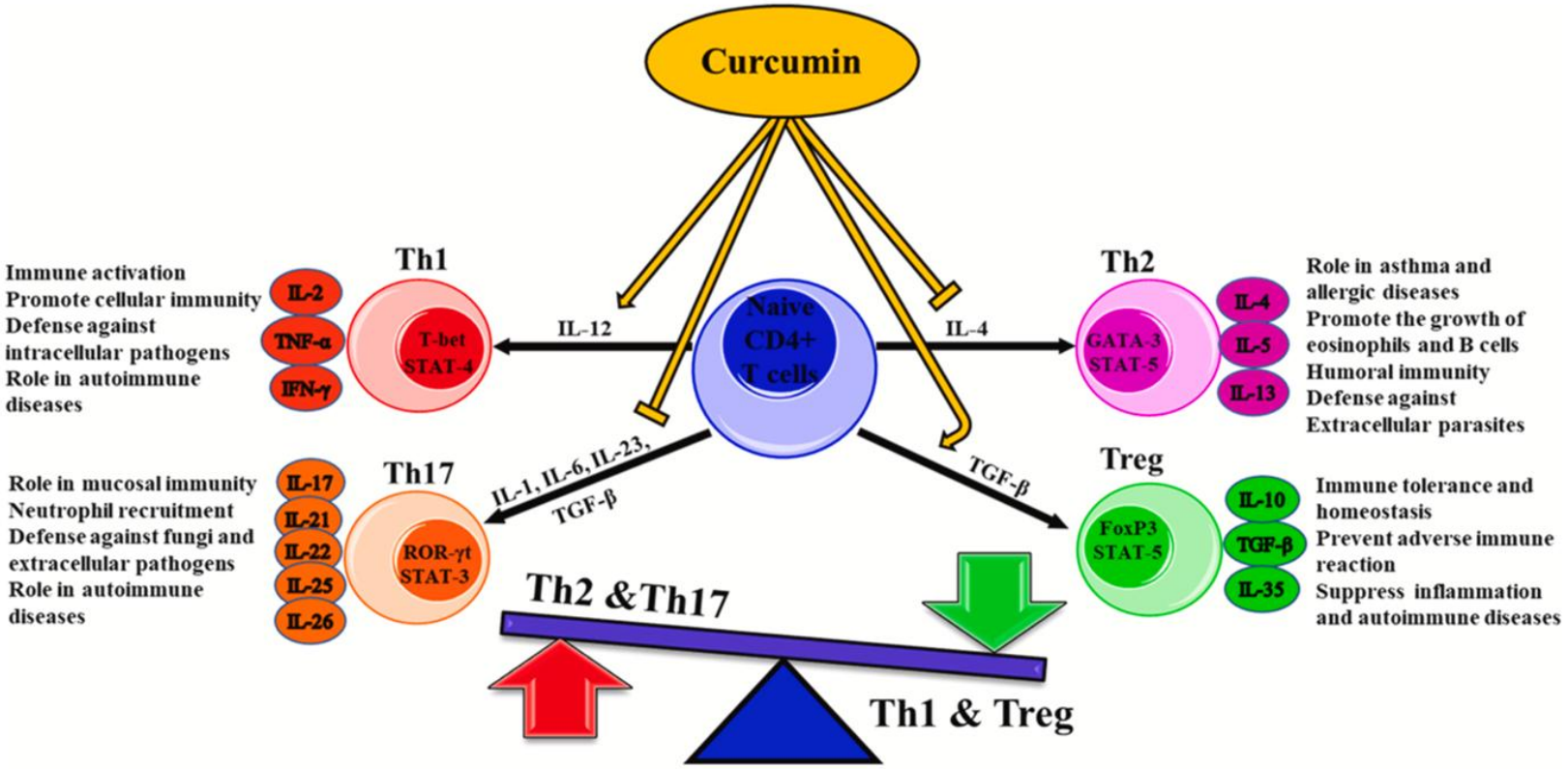


The modulatory effects of curcumin on allergic responses and mast cell activation

Haftcheshmeh SM, et al. Therapeutic potency of curcumin for allergic diseases: A focus on immunomodulatory actions. *Biomed Pharmacother*. 2022;154:113646. doi:10.1016/j.biopha.2022.113646

Pharma Nord Academy

Curcumin

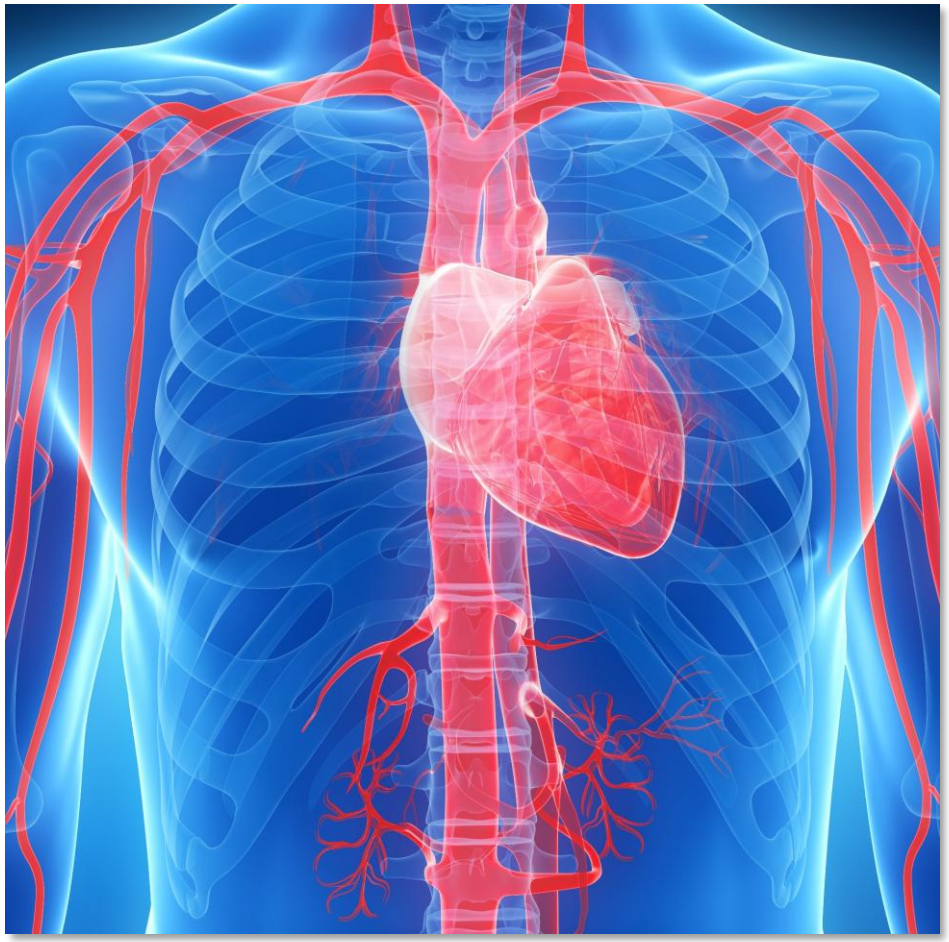


The modulatory effects of curcumin on naive CD4 (Th0) cell differentiation into distinct functional subsets

Haftcheshmeh SM, et al. Therapeutic potency of curcumin for allergic diseases: A focus on immunomodulatory actions. *Biomed Pharmacother*. 2022;154:113646. doi:10.1016/j.biopha.2022.113646

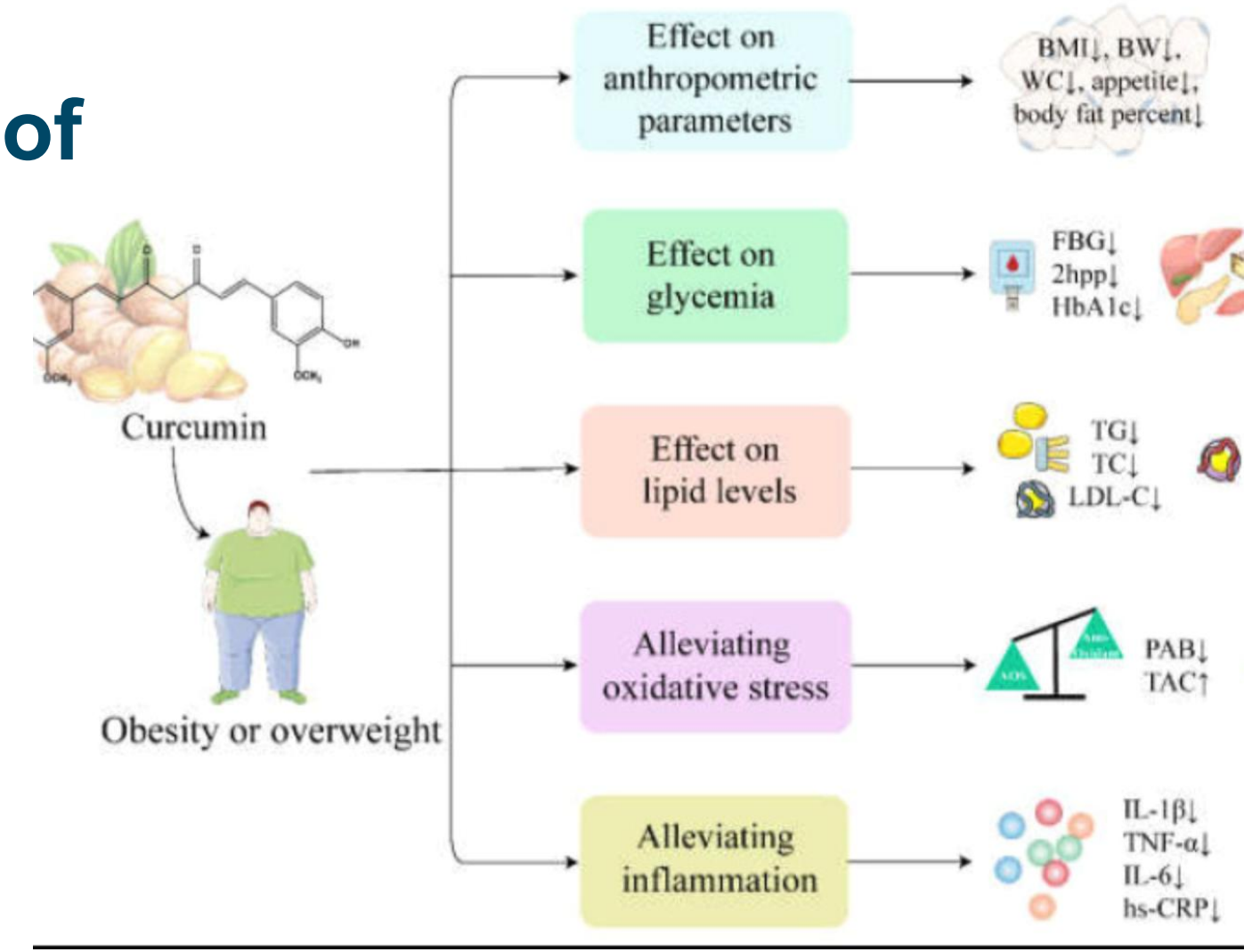
Pharma Nord Academy

Cardiometabolic health



Supports several different aspects of metabolic health

- 2023 review of 38 trials on individuals with either obesity, metabolic syndrome or NAFLD
- Concluded efficacy with curcumin
- But that there is great heterogeneity across trials (doses, preps)



Zeng Y, Luo Y, Wang L, Zhang K, Peng J, Fan G. Therapeutic Effect of Curcumin on Metabolic Diseases: Evidence from Clinical Studies. Int J Mol Sci. 2023 Feb 7;24(4):3323

Example showing wide range of doses used across trials with efficacy

Author	Subject Type	Dose and type of intervention
Khajehdehi et al. (2012)	Lupus Nephritis	1500 mg/d Turmeric (containing 66.3 mg/day curcumin)
Amin et al. (2015)	Metabolic syndrome	2400 mg/d Turmeric (amount of curcumin was not reported)
Jiménez-Osorio et al. (a) (2016)	Nondiabetic proteinuric CKD	320 mg/d Turmeric (containing 107 mg curcumin)
Funamoto et al. (2016)	COPD	180 mg/d Theracurmin
Campbell et al. (2017)	Obese men	500 mg/d curcumin containing 193 mg enhanced bioavailable curcuminoids
Adibian et al. (2017)	Type 2 diabetes	1500 mg/d curcumin containing 440 mg curcuminoids per capsule
Santos-Parker et al. (2017)	Healthy older adults	2000 mg/d optimized Curcumin containing 400 mg curcumin; solid lipid particle formulation
Saberi-Karimian et al. (a) (2018)	Metabolic syndrome	1000 mg/d common curcumin
Saberi- Karimian et al. (b) (2018)	Metabolic syndrome	1000 mg/d containing 200 mg absorption enhanced curcumin
Jazayeri-Tehrani et al. (2019)	Overweight/obese patients with NAFLD	80 mg/d Nano-curcumin

Hadi A, Pourmasoumi M, Ghaedi E, Sahebkar A. The effect of Curcumin/Turmeric on blood pressure modulation: A systematic review and meta-analysis. Pharmacol Res. 2019;150:104505. doi:10.1016/j.phrs.2019.104505

Other health conditions

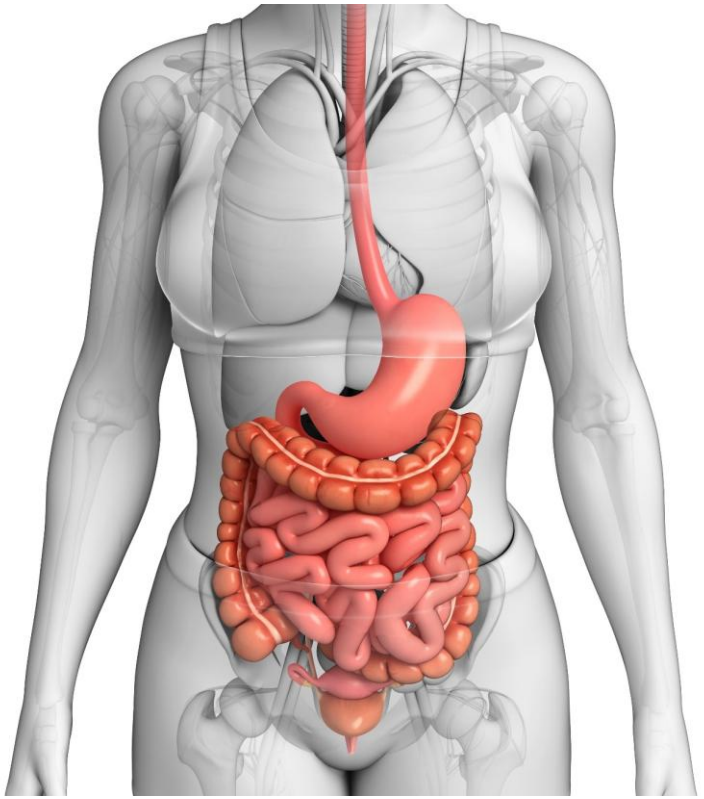
- Endometriosis
- Inflammatory bowel diseases
- Microbiome imbalances and IBS
- Depression
- Cataracts, glaucoma and uveitis
- Certain cancers (to support medical treatment)
- Psoriasis and other inflammatory skin conditions
- Peptic ulcer, gastric ulcer
- Several autoimmune dxs
- Hepatic conditions
- Chronic toxic metal and/or alcohol exposure
- And many more…

Limitations of curcumin in clinical studies and practice

- Huge range of dosages used across human trials
- Standardised curcumin has limited bioavailability (so passes straight through the gut; or is absorbed and quickly metabolized in the liver to be excreted)
- Increasingly wide range of delivery systems
- Thus it can be hard to compare studies

Curcumin has poor bioavailability

- Curcumin is highly sensitive to light and oxygen
  - Thus has limited chemical stability during both manufacturing and storage processes
- Curcumin has poor water solubility
  - This reduces its absorption into plasma and target tissues, thereby limiting its effectiveness
- Curcumin undergoes rapid metabolism (glucuronidation) in the liver and intestine (conjugated before it has a chance to be absorbed)
  - This further reduces its bioavailability *and* shortens its half-life



Zhang HA, Kitts DD. Turmeric and its bioactive constituents trigger cell signaling mechanisms that protect against diabetes and cardiovascular diseases. Mol Cell Biochem. 2021 Oct;476(10):3785-3814.

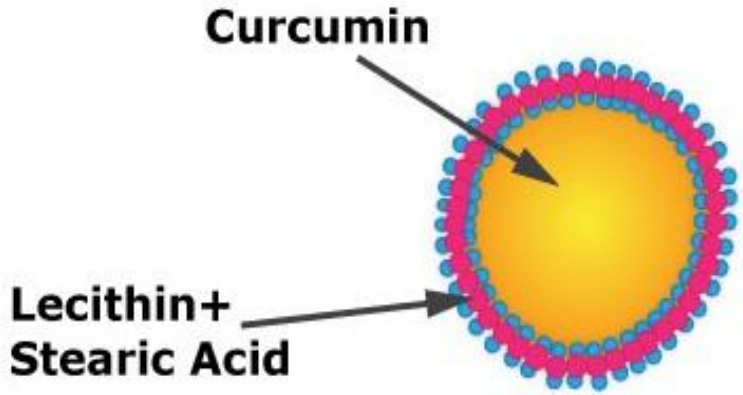
Getting around these issues

- Many clinical studies are now using novel delivery systems that enhance curcumin's solubility, extend its time in plasma and increase its cellular uptake
- E.g. giving with adjuvants piperine or genistein (note: EGCG can *inhibit* curcumin bioavailability)
- Or technologies such as liposomes, polymeric micelles, micro-emulsions, and nano-particles
- But this also means it can be hard to compare studies because they tend to use different types of enhanced bioavailability systems

Fogacci F, Avagimyan A, Cesaro A, Bernardi M, Perone F, Giovannini M, Cicero AFG. The effect of highly bioavailable forms of curcumin on lip systematic review and meta-analysis of randomized clinical studies. Prostaglandins Other Lipid Mediat. 2025 Jun;178:106994

Bio-Curcumin (Longvida)

- An enhanced delivery form of curcumin called ‘Solid Lipid Curcumin Particles’ (SLCP)
- Curcumin is encapsulated inside a sphere of fatty acids and phospholipids (‘liposome matrix’/‘micelle’)
- This allows entry to the lymphatic system vs. the circulatory system, meaning that it…
- …Bypasses the liver's rapid metabolism (glucuronidation) and the kidneys' quick excretion
- Thus it delivers **free** (not deactivated, metabolized nor glucuronidated) curcumin through gut lining



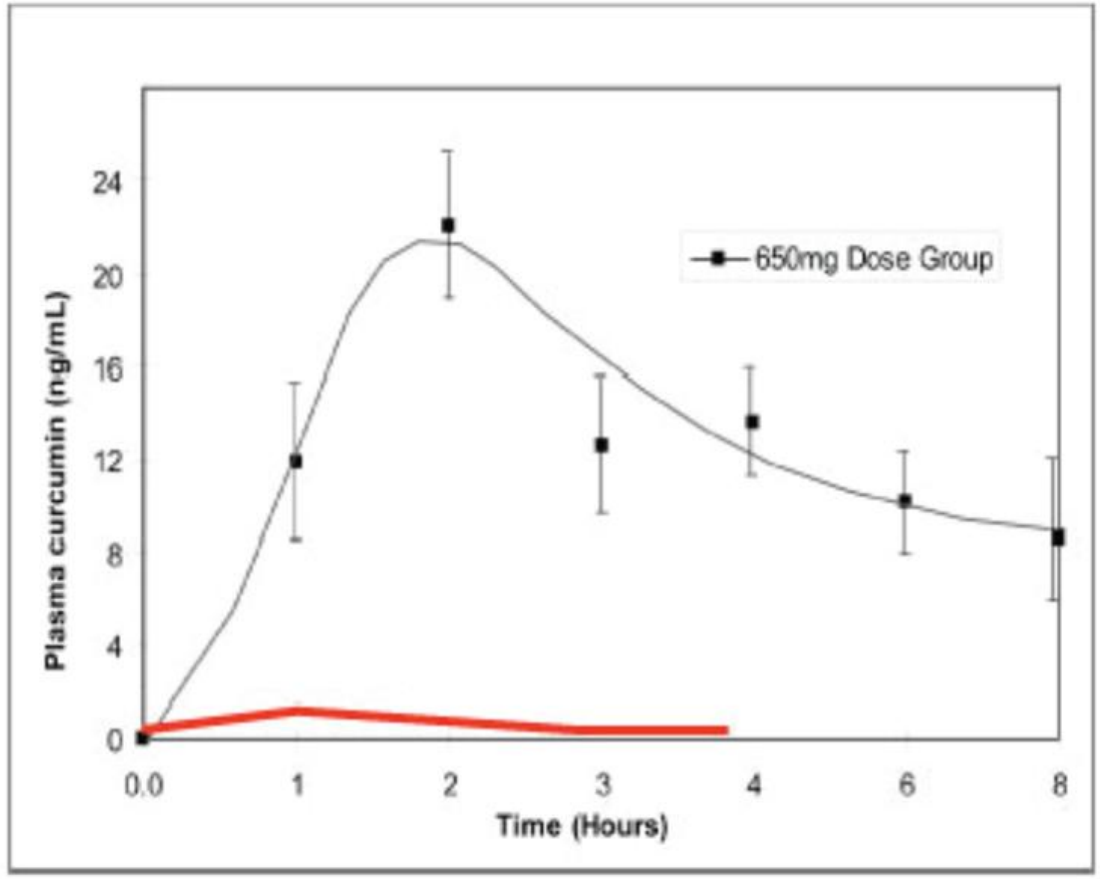
Solid Lipid Curcumin Particle

Grgić J, Šelo G, Planinić M, et al Role of the Encapsulation in Bioavailability of Phenolic Compounds. *Antioxidants*. 2020; 9(10):923.
Gota VS, Maru GB, Soni TG, et al Safety and pharmacokinetics of a solid lipid curcumin particle formulation in osteosarcoma patients and healthy volunteers. J Agric Food Chem. 2010;58(4):2095-2099.

Pharma Nord Academy

65 x higher peak plasma levels and 7 x longer lasting action than standard 95% curcumin

Study showing the mean peak concentration of curcumin achieved from dosing 650 mg of SLCP (approx. 130mg curcumin) was 22.43 ng/mL, whereas plasma curcumin from dosing an equal quantity of 95% curcuminoids extract was not detected

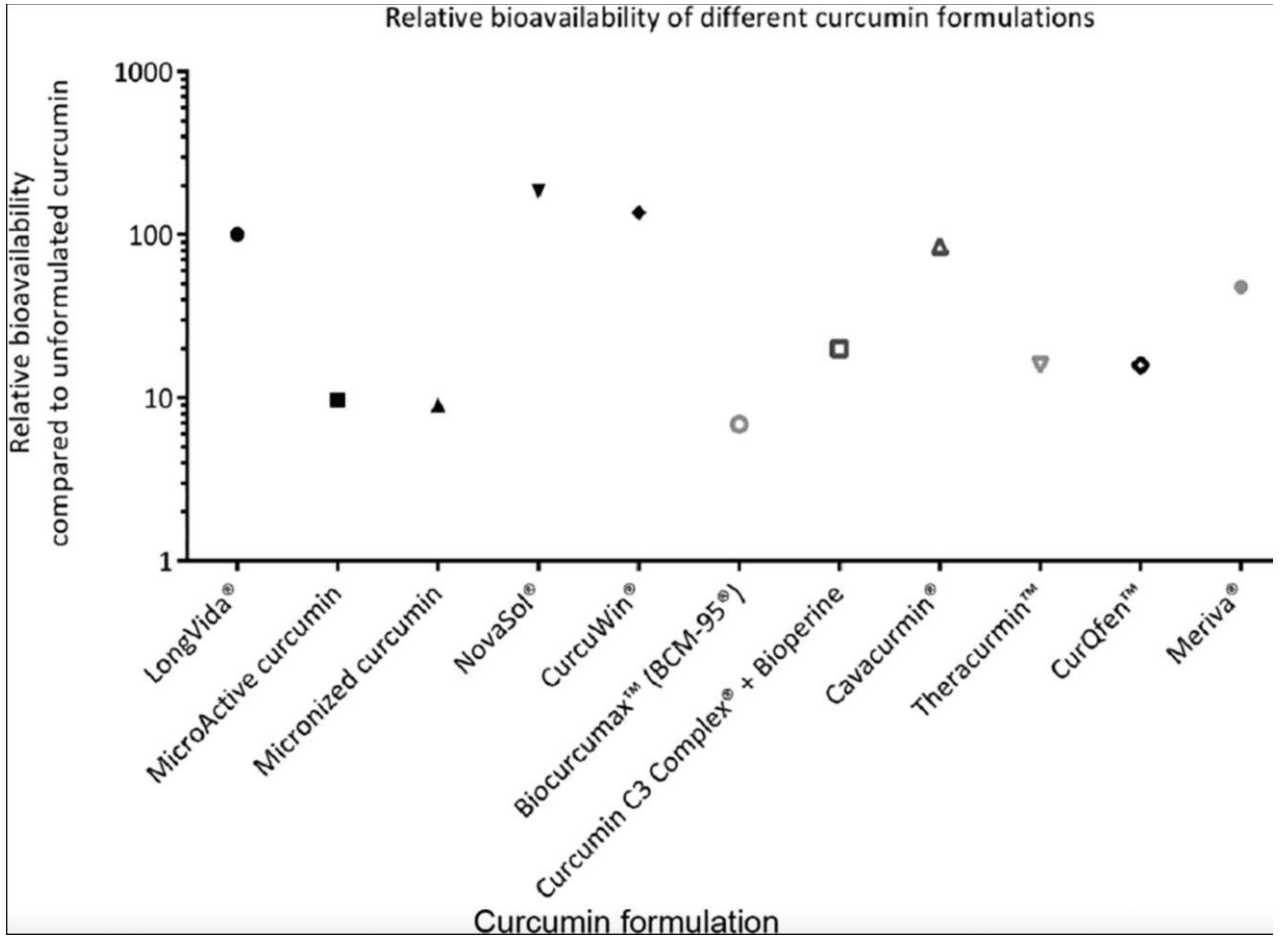


Longvida (black line) is 65 times more bioavailable than 95% curcuminoids (red line).

Gota VS, Maru GB, Soni TG, Gandhi TR, Kochar N, Agarwal MG. Safety and pharmacokinetics of a solid lipid curcumin particle formulation in osteosarcoma patients and healthy volunteers. J Agric Food Chem. 2010 Feb 24;58(4):2095-9

A comparative study of various curcumin formulations reported Longvida to have over 100-fold higher bioavailability relative to unformulated curcumin

Study chart also shows relative bioavailability of other enhanced delivery formulations



Jamwal R. Bioavailable curcumin formulations: A review of pharmacokinetic studies in healthy volunteers. J Integr Med. 2018 Nov;16(6):367-374.

Pharma Nord Academy

Enhanced delivery Bio-Curcumin

- Developed by neuroscientists at UCLA and first commercialized in 2007
- Then reported to cross not only the intestinal barrier, but also the blood brain barrier…and the blood retinal barrier
- And to clear *tau* protein tangles in mice (a protein that clumps into neurofibrillary tangles that damage neurons)
- And to reduce levels of plasma beta-amyloid in humans
- Retinal Aβ plaques are similar to plaques in the brain. Longvida's ability to cross the BBB and its affinity for binding to amyloid beta have led to its consideration as a more cost-effective alternative imaging tool for screening of AD through the eyes

Frost S et al. Retinal amyloid orescence imaging predicts cerebral amyloid burden and Alzheimer's Disease. Alzheimer's Dement. 2014. 10(4): P234-P235, Begum AN, Jones MR, Lim GP, Morihara T, Kim P, Heath DD, Rock CL, Pruitt MA, Yang F, Hudspeth B, Hu S, Faull KF, Teter B, Cole GM, Frautschy SA. Curcumin structure-function, bioavailability, and efficacy in models of neuroinflammation and Alzheimer's disease. J Pharmacol Exp Ther. 2008 Jul;326(1):196-208, Frost S, Kanagasingam Y et al (2014). RETINAL AMYLOID FLUORESCENCE IMAGING PREDICTS CEREBRAL AMYLOID BURDEN AND ALZHEIMER'S DISEASE. Alzheimer's and Dementia. Vol.10(4S Part. 4): 234-P235, DiSilvestro RA, Joseph E, Zhao S, Bomser J. Diverse effects of a low dose supplement of lipidated curcumin in healthy middle aged people. Nutr J. 2012 Sep 26;11:79, Ma QL, Zuo X, Yang F, Ubeda OJ, Gant DJ, Alaverdyan M, Teng E, Hu S, Chen PP, Maiti P, Teter B, Cole GM, Frautschy SA. Curcumin suppresses soluble tau dimers and corrects molecular chaperone, synaptic, and behavioral deficits in aged human tau transgenic mice. J Biol Chem. 2013 Feb 8;288(6):4056-65.

Pharma Nord Academy

Animal study ranks Longvida in the Top 5 plants for neuroprotection

- As part of a strategy to help guide the selection and evaluation of medicinal plant candidates for their neuroprotective potential…
- ... researchers at University of Rhode Island developed a Neuroprotective Potential Algorithm (NPA)…
- … by evaluating 23 standardized and chemically characterized Ayurvedic medicinal plant extracts in a panel of bioassays targeting oxidative stress, carbonyl stress, protein glycation, amyloid beta (Aβ) fibrillation, acetylcholinesterase inhibition, and neuroinflammation
- Longvida scored NPA > 60 (top 5 ranking)

Liu W et al. Development of a neuroprotective potential algorithm for medicinal plants. University of Rhode Island. Neurochem Int. 29 Sep 2016. 100: 164-177

Human trial evidence using Bio-Curcumin (Longvida)

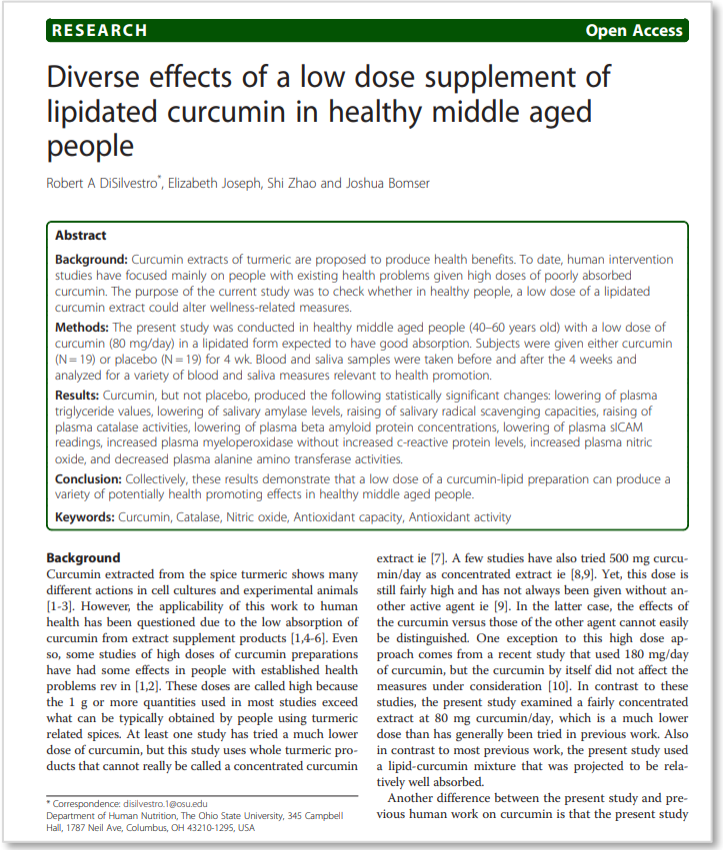
400 mg patented SLCP in each capsule
20% curcuminoids

Pharma Nord Academy

Variety of health-promoting effects in middle aged individuals

DBRCT (N = 38) randomized either Longvida 400mg (80mg curcumin) or placebo for 4 weeks. Results for curcumin groups compared to placebo:

- Lower triglycerides values
- Lower salivary amylase (a marker of SNS stress)
- Lower plasma beta amyloid protein
- Lower plasma sICAM (soluble intercellular adhesion molecule) linked to atherosclerosis
- Lower liver enzyme ALT (alanine amino transferase)
- Increased plasma nitric oxide
- Increased plasma and salivary antioxidant responses



RESEARCH Open Access

Diverse effects of a low dose supplement of lipidated curcumin in healthy middle aged people

Robert A DiSilvestro*, Elizabeth Joseph, Shi Zhao and Joshua Bomser

Abstract

Background: Curcumin extracts of turmeric are proposed to produce health benefits. To date, human intervention studies have focused mainly on people with existing health problems given high doses of poorly absorbed curcumin. The purpose of the current study was to check whether in healthy people, a low dose of a lipidated curcumin extract could alter wellness-related measures.

Methods: The present study was conducted in healthy middle aged people (40–60 years old) with a low dose of curcumin (80 mg/day) in a lipidated form expected to have good absorption. Subjects were given either curcumin (N = 19) or placebo (N = 19) for 4 wk. Blood and saliva samples were taken before and after the 4 weeks and analyzed for a variety of blood and saliva measures relevant to health promotion.

Results: Curcumin, but not placebo, produced the following statistically significant changes: lowering of plasma triglyceride values, lowering of salivary amylase levels, raising of salivary radical scavenging capacities, raising of plasma catalase activities, lowering of plasma beta amyloid protein concentrations, lowering of plasma sICAM readings, increased plasma myeloperoxidase without increased c-reactive protein levels, increased plasma nitric oxide, and decreased plasma alanine amino transferase activities.

Conclusion: Collectively, these results demonstrate that a low dose of a curcumin-lipid preparation can produce a variety of potentially health promoting effects in healthy middle aged people.

Keywords: Curcumin, Catalase, Nitric oxide, Antioxidant capacity, Antioxidant activity

Background

Curcumin extracted from the spice turmeric shows many different actions in cell cultures and experimental animals [1-3]. However, the applicability of this work to human health has been questioned due to the low absorption of curcumin from extract supplement products [1,4-6]. Even so, some studies of high doses of curcumin preparations have had some effects in people with established health problems rev in [1,2]. These doses are called high because the 1 g or more quantities used in most studies exceed what can be typically obtained by people using turmeric related spices. At least one study has tried a much lower dose of curcumin, but this study uses whole turmeric products that cannot really be called a concentrated curcumin extract ie [7]. A few studies have also tried 500 mg curcumin/day as concentrated extract ie [8,9]. Yet, this dose is still fairly high and has not always been given without another active agent ie [9]. In the latter case, the effects of the curcumin versus those of the other agent cannot easily be distinguished. One exception to this high dose approach comes from a recent study that used 180 mg/day of curcumin, but the curcumin by itself did not affect the measures under consideration [10]. In contrast to these studies, the present study examined a fairly concentrated extract at 80 mg curcumin/day, which is a much lower dose than has generally been tried in previous work. Also in contrast to most previous work, the present study used a lipid-curcumin mixture that was projected to be relatively well absorbed.

Another difference between the present study and previous human work on curcumin is that the present study

* Correspondence: disilvestro.1@osu.edu
Department of Human Nutrition, The Ohio State University, 345 Campbell Hall, 1787 Neil Ave, Columbus, OH 43210-1295, USA

DiSilvestro RA, Joseph E, Zhao S, Bomser J. Diverse effects of a low dose supplement of lipidated curcumin in healthy middle aged people. Nutr J. 2012 Sep 26;11:79.

Pharma Nord Academy

Longvida Curcumin in knee OA

Study: Double-blind placebo, 90 days trial, 2019

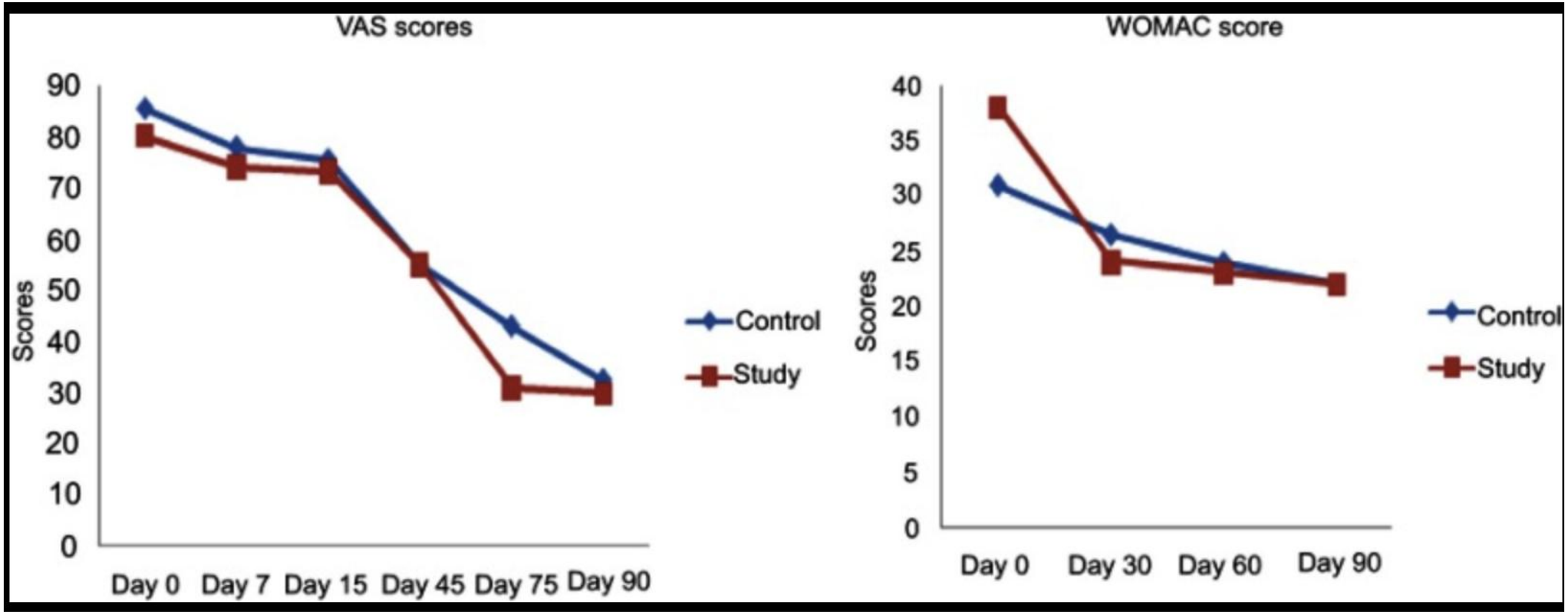
- 2x 400mg/d SLCP (**solid lipid curcumin particles**), providing total of 160mg actual curcumin (i.e. the active ingredient comprises approx. 20% of total)
- V.s. Ibuprofen 400mg/d

Findings:

- Significant improvements in OA sxs (see graph →)
- 160 mg daily was found to be effective & safe in alleviating symptoms in patients suffering from knee osteoarthritis when administered for 90 days
- *'Comparable efficacy of SLCP in alleviating pain with Ibuprofen'*.

Gupte PA, Giramkar SA, Harke SM, et al. Evaluation of the efficacy and safety of Capsule Longvida® Optimized Curcumin (solid lipid curcumin particles) in knee osteoarthritis: a pilot clinical study. J Inflamm Res. 2019 Jun 5;12:145-152

Effect of **Longvida** on clinical pain scores
(note the control is ibuprofen)



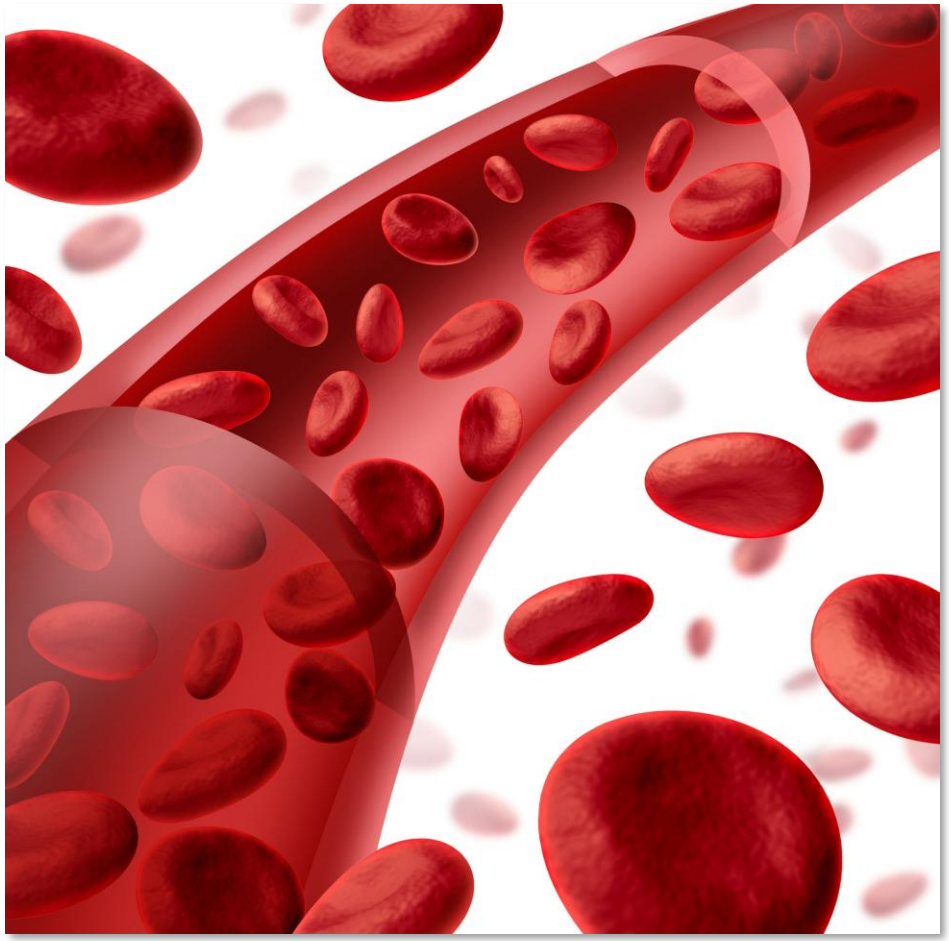
Gupte PA, Giramkar SA, Harke SM, et al. Evaluation of the efficacy and safety of Capsule Longvida® Optimized Curcumin (solid lipid curcumin particles) in knee osteoarthritis: a pilot clinical study. J Inflamm Res. 2019 Jun 5;12:145-152

Pharma Nord Academy

Vascular endothelial function

Endothelial dysfunction is the impaired functioning of the thin cell layer lining blood vessels, leading to a lower ability to regulate blood flow; and increased inflammation

Involves decreased production of nitric oxide, impaired vasodilation, and a pro-inflammatory, pro-thrombotic state that → CVD



Vascular Endothelial Function

Double-blind, parallel design, randomized study (2017)	
Curcumin supplementation improves vascular endothelial function in healthy middle-aged and older adults by increasing nitric oxide bioavailability and reducing oxidative stress	
Objective	Evaluate curcumin on age-related vascular endothelial function in healthy older men & postmenopausal women
Methods	Curcumin (2000 mg/day Longvida® pill) or placebo supplementation for 12 weeks
Participants	39 participants, aged between 45-75 years
Measures	Resistance artery endothelium dependent dilation (EDD) in the absence & presence of nitric oxide production & oxidative stress; conduit artery EDD; large elastic artery stiffness, & circulating markers of oxidative stress & inflammation

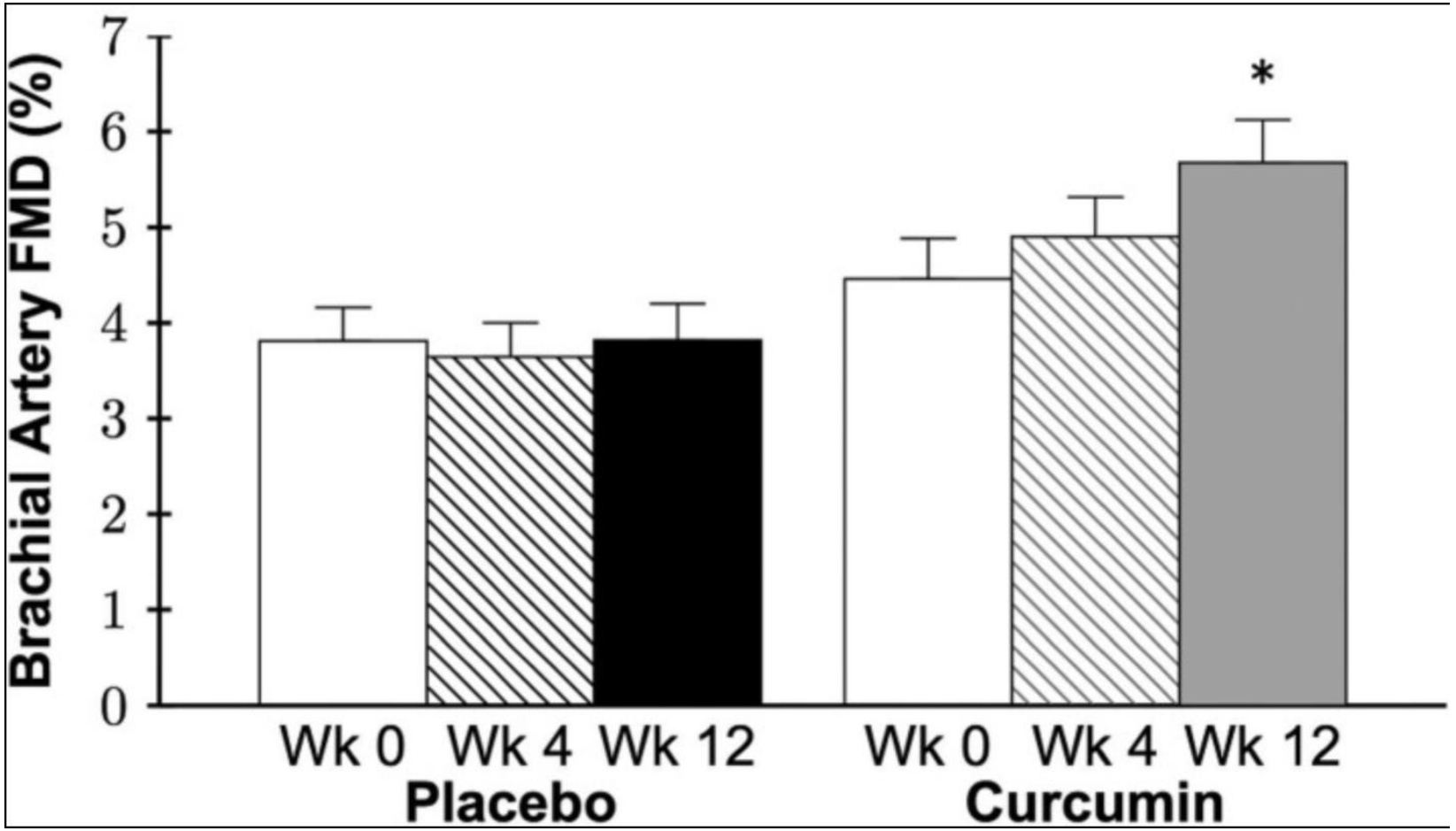
Results:

12 weeks curcumin supplementation improves resistance artery endothelial function by:

- Increasing vascular nitric oxide bioavailability
- Reducing oxidative stress
- Improving conduit artery endothelial function

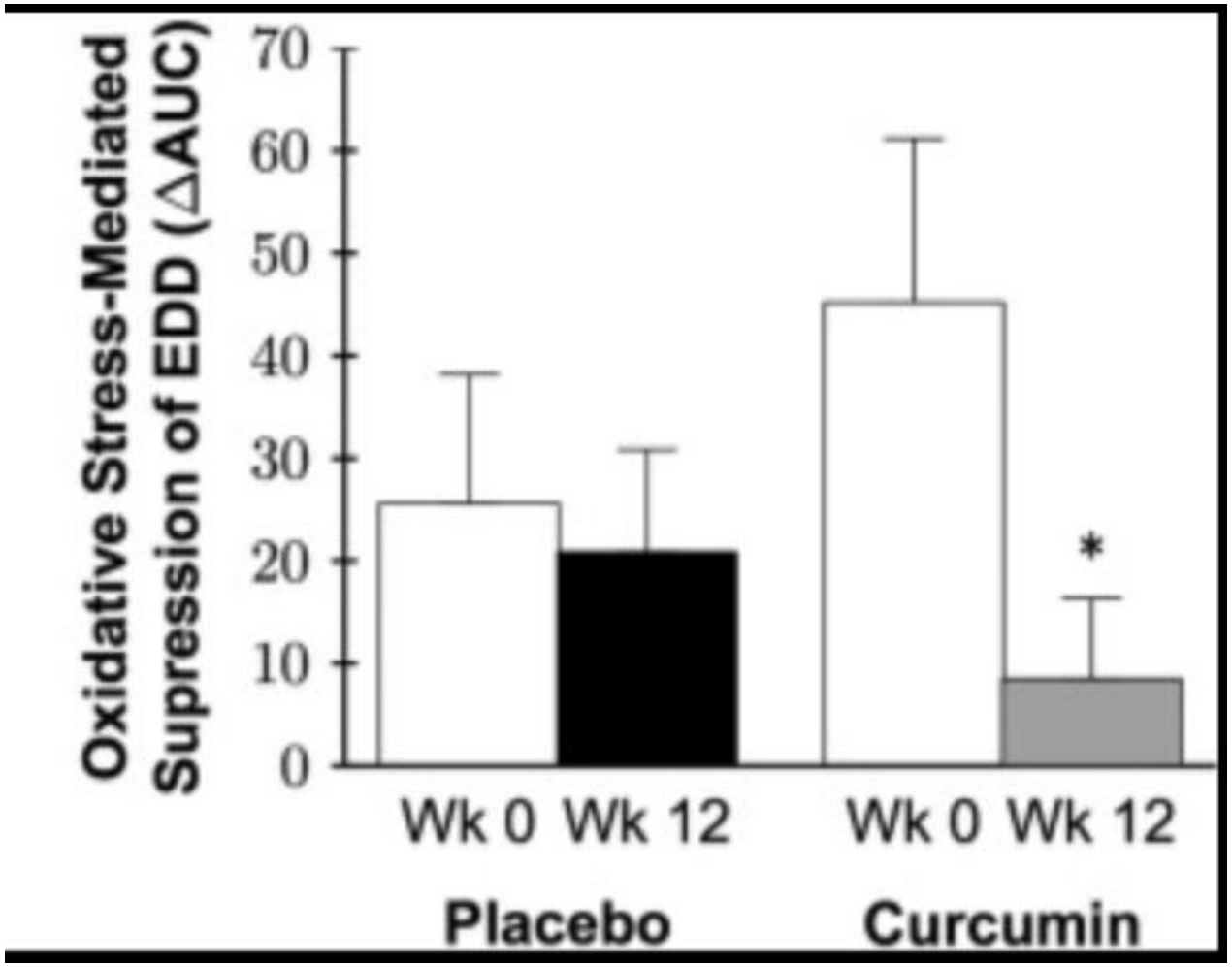
Santos-Parker JR, Strahler TR, Bassett CJ, Bispham NZ, Chonchol MB, Seals DR. Curcumin supplementation improves vascular endothelial function in healthy middle-aged and older adults by increasing nitric oxide bioavailability and reducing oxidative stress. *Aging (Albany NY)*. 2017;9(1):187-208. doi:10.18632/aging.101149

Brachial artery flow-mediated dilation (FMD) expressed as %age change at week 0 and after 4 and 12 weeks of placebo or curcumin supplements



Pharma Nord Academy

Oxidative stress-mediated *suppression* of endothelium-dependent dilation (EDD) at baseline and week 12



Santos-Parker JR, Strahler TR, Bassett CJ, Bispham NZ, Chonchol MB, Seals DR. Curcumin supplementation improves vascular endothelial function in healthy middle-aged and older adults by increasing nitric oxide bioavailability and reducing oxidative stress. Aging (Albany NY). 2017 Jan 3;9(1):187-208

Bio-Curcumin in the brain

- Cognitive, memory and mood chronic conditions are often caused by neuronal damage that come from chronic activation of microglial cells
  - Primed microglia secrete free radicals and cytotoxic cytokines
- A 6-month mouse study reported that feeding LongVida daily led to a significant reduction in the number of activated microglia in the hippocampus and the cerebellum
- And to improved balance (measured by how long the mice could stay on a rotating rod before falling)
- Concluded Longvida can attenuate inflammatory pathology and ameliorate neurodegeneration and motor deficits in mice; and that studies should be done on patients with neuro-inflammatory disorders

Ullah F, Asgarov R, Venigalla M, Liang H, Niedermayer G, Münch G, Gyengesi E. Effects of a solid lipid curcumin particle formulation on chronic activation of microglia and astroglia in the GFAP-IL6 mouse model. Sci Rep. 2020 Feb 11;10(1):2365.

Memory, mental fatigue and mood

Double-blind RCT (2020)

Further Evidence of Benefits to Mood and Working Memory from Lipidated Curcumin in Healthy Older People: A 12-Week, Double-Blind, Placebo-Controlled, Partial Replication Study

Objective	Evaluate curcumin on mood and memory on healthy older people
Methods	Curcumin (400mg Longvida) vs placebo over 12 weeks
Participants	80 participants, aged between 50-80
Measures	Neuropsych tests for cognitive performance and mood

Results:

Compared to placebo, curcumin was associated with significantly:

- Better working memory performance
- Lower fatigue scores
- Lower reports of tension, anger, confusion & total mood disturbance (at 4 weeks)

Cox KHM, White DJ, Pipingas A, Poorun K, Scholey A. Further Evidence of Benefits to Mood and Working Memory from Lipidated Curcumin in Healthy Older People: A 12-Week, Double-Blind, Placebo-Controlled, Partial Replication Study. *Nutrients*. 2020;12(6):1678. Published 2020 Jun 4. doi:10.3390/nu12061678

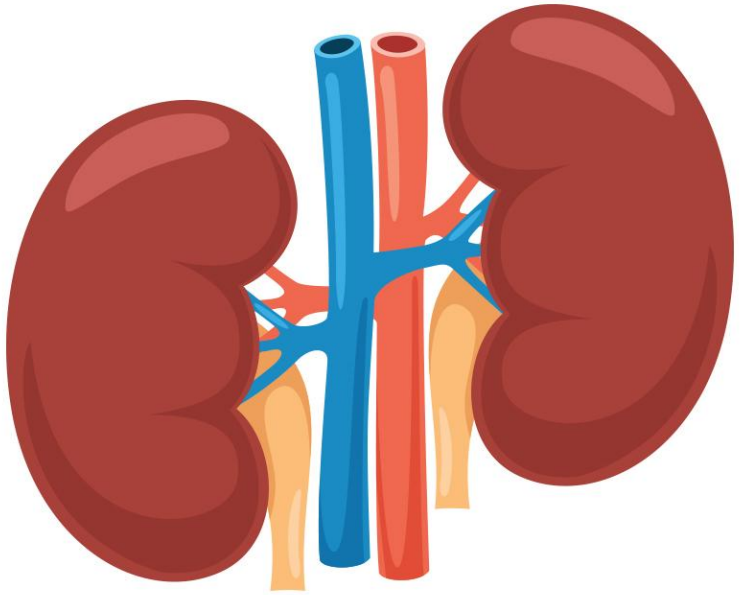
An earlier study on motor-cognitive function in healthy adults

- This earlier study on Longvida had reported no improvement in motor nor cognitive functions in healthy middle-aged and older adults
- The researchers say it is possible that curcumin may enhance these functions in groups with greater baseline impairments than those studied here, including adults greater than 75 years of age and/or patients with clinical disorders
  - The people in the study were all healthy at baseline
  - We saw in our recent seminar on cognition that most nutraceuticals tend to have most effect in people with established MCI

Santos-Parker JR, Lubieniecki KL, Rossman MJ, Van Ark HJ, Bassett CJ, Strahler TR, Chonchol MB, Justice JN, Seals DR. Curcumin supplementation and motor-cognitive function in healthy middle-aged and older adults. Nutr Healthy Aging. 2018 Jun 15;4(4):323-333.

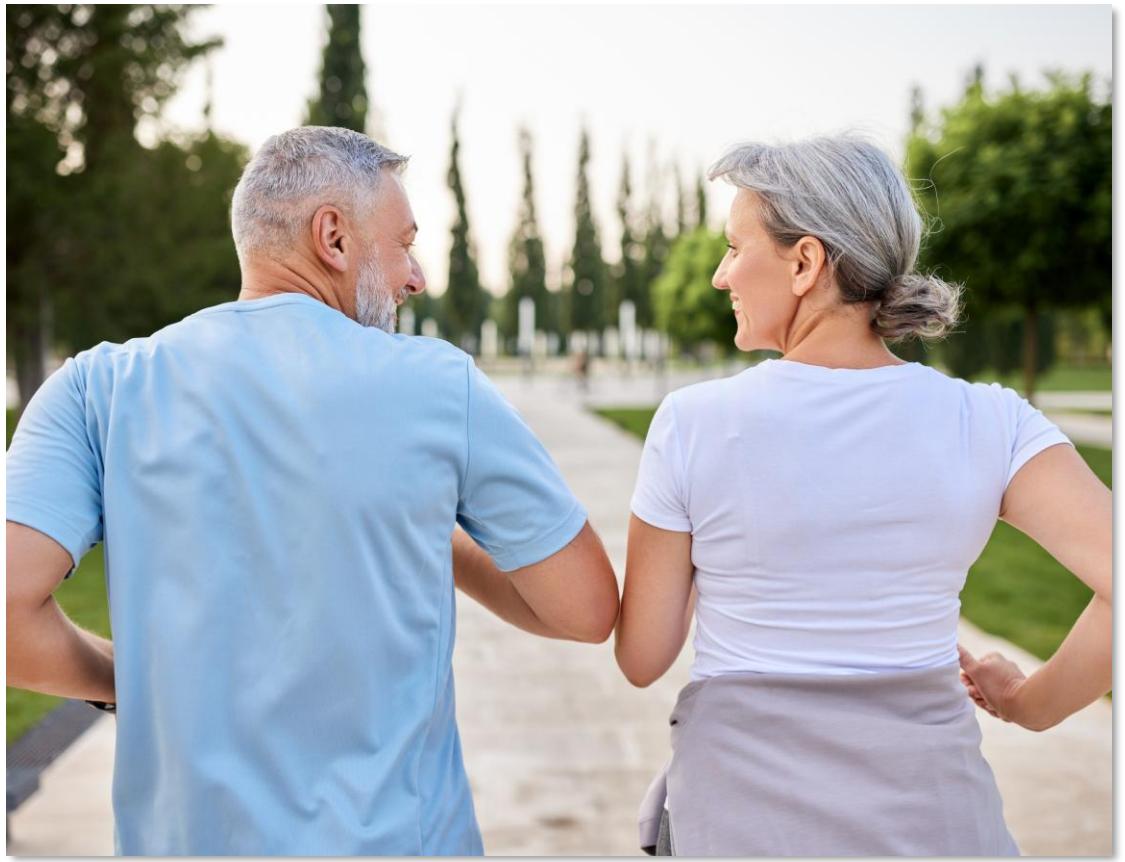
And no effect to date in CKD

- For example, although curcumin has been shown to support vascular and cognitive health, 12 months of Longvida did not improve kidney function (brachial artery flow-mediated dilation) in a RCT of 88 older adults with CKD
- Eighty-eight adults diagnosed with stage 3b or 4 CKD (aged 66 ± 8 years, 75% male)



Gimblet CJ, Kruse NT, Geasland K, Michelson J, Sun M, Ten Eyck P, Linkenmeyer C, Mandukhail SR, Rossman MJ, Sambharia M, Chonchol M, Kurella Tamura M, Seals D, Hoth KF, Jalal D. Curcumin Supplementation and Vascular and Cognitive Function in Chronic Kidney Disease: A Randomized Controlled Trial. Antioxidants (Basel). 2024 Aug 14;13(8):983.

Enhancing the effects of physical exercise



Exercise-induced inflammation and muscle damage (EIMD)

- EIMD and delayed onset muscle soreness (DOMS) impact subsequent training sessions and activities of daily living even in active individuals. In sedentary or diseased individuals, EIMD and DOMS may present even in the absence of structured exercise
- Subjects (N = 28) were randomly assigned to either Longvida (400 mg/day) or placebo (rice flour) and supplemented 2 days before to 4 days after EMID (eccentric-only dual-leg press exercise). Blood samples were collected prior to the challenge and 1, 2, 3, and 4 days after
- **Results:** There was no change in DOMS but Longvida led to smaller increases in inflammatory cytokines and study concludes this may → faster recovery and better capacity in subsequent exercise sessions

McFarlin BK, Venable AS, Henning AL, Sampson JN, Pennel K, Vingren JL, Hill DW. Reduced inflammatory and muscle damage biomarkers following oral supplementation with bioavailable curcumin. BBA Clin. 2016 Feb 18;5:72-8.

Can be taken alongside HIIT

- Curcumin is an antioxidant and anti-inflammatory and some AO supplements (e.g. vit C) and anti-inflammatory practices (e.g. ice baths) have been found to potentially attenuate exercise-induced adaptations in muscle
- A trial of Longvida during HIIT training in well-trained and recreationally trained cyclists reported no such detrimental effects
- 36 healthy adults were randomised to take either Longvida (1,000mg/day) or placebo for 14 days of HIIT
  - No detriment to cycling time trial performance was found (TTP actually increased but not to statistical significance)

Kisiolek JN, Kheredia N, Flores V, Ramani A, Lisano J, Johnston N, Stewart LK. Short Term, Oral Supplementation with Optimized Curcumin Does Not Impair Performance Improvements Associated with High Intensity Interval Training. J Diet Suppl. 2022;19(6):733-746.

Safety of Bio-Curcumin (Longvida)

- In trials, no reports of GI irritation as with some other preps because:
  - Lower amounts of curcumin can be used
    - Trials use 1-2 capsule 400mg, of which 80-160mg is curcumin
  - No need for the use of black pepper or other adjuvants that can irritate the gut lining in some individuals
- Shown to have a positive safety profile at 8,000-12,000mg/day (far higher than the therapeutic dose)

For all preps of curcumin:

1. Be sure to check DNIs. E.g. tamoxifen, immunosuppressants, blood thinners
2. May increase gallbladder contractions
3. Avoid in pregnancy, lactation and around surgery

Koronyo Y, Biggs D, Barron E, et al. Retinal amyloid pathology and proof-of-concept imaging trial in Alzheimer's disease. JCI Insight. 2017 Aug 17;2(16):e93621

Q&A Panel Webinar

Barrier Health

With Lorraine Nicolle, Sue Camp & Helen Lynam

- Tuesday **2nd December 2025**
- 10:00 am – 11:00 am GMT
- Sign-up for this and our other webinars at:

pharmanord.co.uk/webinars

Pharma Nord
Academy

Our latest Seminar programme

Nutrition for Healthy Body Barriers

- Full-day deep dive
- CPD approved for 5 hours (BANT, NNA, NTOI)
- Complimentary refreshments, lunch, vouchers & products
- Various dates until Nov 27th
- Sign up at **pharmanord.co.uk/events**

Thank you!

Please email

pro@pharmanord.com

For any queries!

Pharma Nord Academy