

## THERACURMIN HP® BIOAVAILABLE CURCUMIN

Theracurmin is a novel preparation of turmeric that utilizes patented, colloidal dispersion technology to enhance bioavailability and dramatically increase curcumin levels in the blood.\* Unlike other forms of curcumin, Theracurmin is water-dispersible, meaning it dissolves quickly and maintains solubility over time, thereby improving curcumin's overall absorption.

### Over 27 Times More Bioavailable

Standard curcumin is poorly absorbed even at high doses. Human trials show that Theracurmin is over 27 times more bioavailable than standard curcumin extracts.<sup>1</sup> This high absorbability suggests Theracurmin supplementation can maximize curcumin's biological effects in the body.\*

### Demonstrated Results

Theracurmin has been the subject of compelling research demonstrating its ability to promote healthy liver function, and more research is under way.\*

Historically, curcumin has been shown to:

- Support the body's detoxification pathways.\*
- Support the body's cytokine and chemotactic response.\*
- Provide relief of minor pain due to occasional overuse.\*

### Theracurmin® HP - Available in Two Sizes

Theracurmin HP provides 180 mg curcumin in only two capsules in both a 60 and 120 count bottle size allowing for more flexibility in patient dosing.

Visit [integrativepro.com/theracurmin-HP](http://integrativepro.com/theracurmin-HP) for more information.



wheat free



gluten free



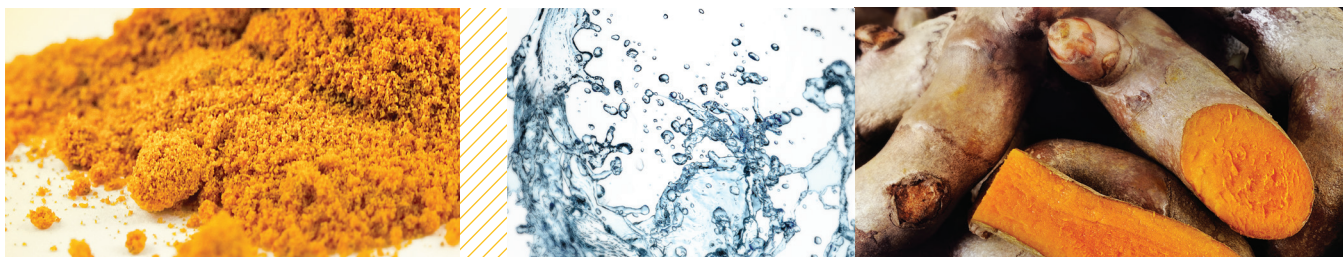
soy free



dairy free



vegan



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1. Sasaki H, Sunagawa Y, Takahashi K, et al. Innovative preparation of curcumin for improved oral bioavailability. *Biol Pharm Bull.* 2011;34(5):6605.

\*THESE STATEMENTS HAVE NOT BEEN EVALUATED BY THE FOOD AND DRUG ADMINISTRATION. THESE PRODUCTS ARE NOT INTENDED TO DIAGNOSE, TREAT, CURE, OR PREVENT ANY DISEASE.

# THERACURMIN®

## Background

The dried, ground rhizome of turmeric (*Curcuma longa*) has been used in Asian medicine for centuries. This perennial plant in the ginger family is cultivated throughout the tropics and is used as both a spice and to support health.\* Curcumin is a term that is sometimes used to refer to any or all of the curcuminoid compounds in turmeric. There are three main curcuminoids in turmeric, of which curcumin (diferuloylmethane) is the best studied. Other curcuminoids in turmeric include demethoxycurcumin and bisdemethoxycurcumin. Curcumin imparts yellow color to the rhizome.

## How it Works

Curcumin supports antioxidant pathways\*<sup>1,2</sup> demonstrating several effects on the body.

- Supports healthy cardiovascular, liver, lung, and kidney function\*<sup>3-6</sup>
- Supports optimal immune function\*
- Supports normal soft tissue proliferation<sup>7</sup> and remodeling functions<sup>8</sup> (e.g., angiogenesis, collagen deposition, granulation tissue formation, epithelialization, and tissue contraction)\*<sup>9</sup>

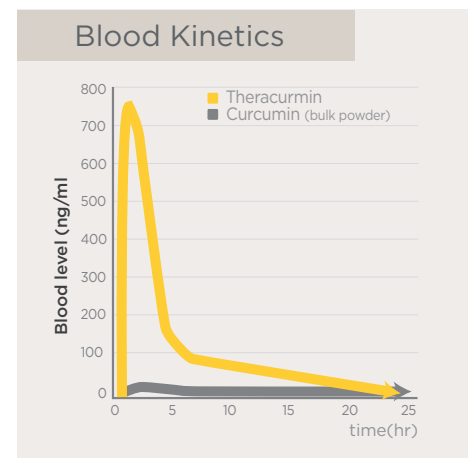
Mechanisms of action are still under intensely prolific investigation, and publications on curcumin in the medical literature number in the thousands. Among its many observed biochemical effects, curcumin has been found to interact profoundly with several mechanisms in the body that support a healthy cytokine and chemotactic response.\* For example, curcumin down-regulates COX-2 and iNOS enzymes, likely by suppressing NF-κB activation;<sup>10</sup> it inhibits arachidonic acid metabolism via lipoxygenase and scavenging of free radicals generated in this pathway; it inhibits the production of cytokines, TNF-α, interleukins, monocyte chemoattractant protein (MCP) and migration inhibitory protein; it down-regulates mitogen-activated Janus kinases and Protein Kinase C.\*<sup>11-13</sup> In addition, the vanilloid part of the curcumin molecule is important for activation of the transient receptor potential vanilloid 1 (TRPV1, also known as the capsaicin receptor), which plays an important role in nociception.\* Among the several modes of action identified for turmeric, experimental research indicates that curcumin blocks TRPV1 activation and thereby inhibits TRPV1-mediated pathways.\*<sup>14</sup>

## Bioavailability of Curcumin

The clinical usefulness of curcumin has been limited by its chemical instability at intestinal pH values, by its low water solubility, and by its poor oral bioavailability and quick conjugation and excretion. As a result, several human studies of standard curcumin have failed, even at high doses, and its full clinical potential remains unrealized.<sup>15</sup> In humans, curcumin is very poorly absorbed, rapidly metabolized, and quickly eliminated. Once in the plasma, however, curcumin is quite stable and even available to hard-to-reach tissues, such as the brain as seen in experimental animal models.<sup>16</sup> The challenge, therefore, has been to find a way to stabilize curcuminoids in the gut and deliver them to the plasma without the use of synthetic agents or substances that are otherwise undesirable. Several strategies have been employed to improve curcumin bioavailability, with varying degrees of success. These include the use of adjuvants, like piperine, that interfere with glucuronidation; use of liposomal curcumin; curcumin phospholipid complexes; curcumin submicron particles; curcumin nanoparticles; surfactant additives; cyclodextrin matrices of curcumin; and use of structural analogues of curcumin.<sup>15,17</sup>

## Bioavailability of Theracurmin®

Theracurmin is a novel turmeric preparation with dramatically enhanced absorption and bioavailability. Finely milled turmeric is made into a colloid with glycerin and a vegetable gum called gum ghatti, which mainly consists of polysaccharides obtained from the sap of ghatti trees (*Anogeissus latifolia*). Theracurmin is very stable against light and heat, has unmatched dispersion and stability in water, is 27 times more bioavailable in humans than standard curcumin, and is many times more bioavailable than other commercially available curcumin supplements (*see chart*).\* Theracurmin is properly categorized as a submicron particle.



Theracurmin enhances gastrointestinal absorption as a result of a unique colloidal dispersion. In one study male (n=8) and female volunteers (n=6), aged between 30 and 59 years, with a body mass index ranging from 18–30 were selected. The selected subjects were not taking any medications before or during this study. Both curcumin powder and Theracurmin in liquid form were administered orally at a dose of 30 mg of curcumin. Subjects were randomly assigned to dose groups, with 7 subjects in each treatment group. Blood samples were collected before dosing and at 1, 2, 4, 6, and 24 hours after curcumin was administered. The 24-hour AUC of Theracurmin (113 ng/mL) after a single dose was 27-fold higher than that of standard curcumin (4.1 ng/mL).<sup>18</sup> Cmax for Theracurmin was 29.5 ng/ml, compared to 1.8 ng/ml for standard curcumin. Theracurmin reached Tmax in one hour, compared to six hours for standard curcumin. Following this study, it remained to be determined whether higher doses of Theracurmin could increase plasma curcumin levels in a dose-dependent manner.\* Kanai and colleagues therefore conducted a dose escalation study in which they administered differing doses of Theracurmin to six healthy human volunteers.<sup>19</sup> Curcumin was given at a single oral dose

of 150 mg (as 1,500 mg Theracurmin). After an interval of 2 weeks, the same subjects then received curcumin at a single dose of 210 mg (2,100 mg Theracurmin). Plasma curcumin levels were measured at 0, 1, 2, 4, 6, and 24 h after each dosing using HPLC. C<sub>max</sub> for curcumin (as Theracurmin) at 150 and 210 mg was 189 ng/ml and 275 ng/ml respectively, and the AUC for 24 h was estimated to be 2,649 and 3,649 ng/ml. The t<sub>1/2</sub> was estimated to be 9.7 h for 150 mg and 13.0 h for 210 mg doses. Researchers concluded that Theracurmin increased plasma curcumin levels in a dose-dependent manner without saturating the absorption system.\* These results were similar to the levels observed in a previous clinical trial and compared favorably with intake of 8 g of conventional curcumin (134 ± 70 ng/ml).<sup>20</sup>

Theracurmin demonstrates far greater absorption efficiency than other commercially available curcumin preparations.\* A study published in the Journal of Nutritional Science and Vitaminology,<sup>21</sup> compared plasma curcumin levels after administration of Theracurmin and two other commercially available curcumin formulations. In this double-blind, 3-way crossover study, healthy male (n=5) and female (n=4) volunteers aged between 24-32 years were administered consecutive single oral doses of each curcumin supplement. Dosing of the commercial products were based on the calculated mass of curcumin of those products. Blood specimens were obtained prior to administration of each capsule and at 0.5, 1, 2, 4, 6 and 24 hours after dosing. At each interval plasma concentrations were greater with Theracurmin than with the other two formulations.\* The maximal level (C<sub>max</sub>) and total area under the curve (AUC) of plasma curcumin were assessed over the 24-hour period following administration.



C<sub>max</sub>: The authors report that the maximal plasma curcumin concentration (C<sub>max</sub>) of Theracurmin (287.2 ng/mL) was 5.6 - 10.7 times higher than that for the other two commercial preparations. Notably, the plasma concentration of Theracurmin remaining at the end of the 24 hour test period (66.4 ng/mL) was higher than even the maximum values (C<sub>max</sub>) achieved by either of the other two commercial preparations at their peak.\*

AUC: The authors report the Area Under the Curve (AUC) for plasma concentration over time as follows:

At 6 hours: AUC<sub>0-6h</sub> was reported to be 5.6 and 16.1-fold higher for Theracurmin relative to the other two formulations, respectively.\*

At 24 hours: AUC<sub>0-24h</sub> was reported to be 4.6 and 11.0-fold higher for Theracurmin relative to the other two preparations, respectively.\*

The authors conclude that bioavailability of curcumin is significantly better with Theracurmin.

## Benefits of Theracurmin

Theracurmin has been the subject of several studies, some still ongoing.

### Liver support\*

Theracurmin has demonstrated a liver supportive effect in humans.\* Researchers conducted a small crossover study (n = 7) to evaluate the effects on liver function after oral administration of Theracurmin that contains 30 mg of curcumin.<sup>18</sup> Normal blood acetdehyde concentrations were supported with Theracurmin, compared to the time when subjects did not take Theracurmin.\* Shimatsu and colleagues reported further beneficial hepatic effects of Theracurmin, orally administered to healthy volunteers (n = 19).<sup>22</sup> Liver function markers, such as gamma-glutamyl transpeptidase (γ-GTP), aspartate transaminase (AST), and alanine transaminase (ALT), were assessed before and after a regiment of 90 mg twice daily for 1 month, with little lifestyle modification. Significant decreases were observed in overall mean AST (-12%, p = 0.016), ALT (-16%, p = 0.041), and γ-GTP (-15%, p = 0.010).\* Further, liver function was more markedly improved in subjects who had higher baseline values than in relatively normal ones.\*

### Skin moisture\*

Shimatsu and colleagues also reported that healthy women who received oral Theracurmin (at doses of 30 and 90 mg curcumin twice daily in the morning and evening) for 4 weeks, had skin moisture level significantly increased from baseline (average 15% increase).<sup>22</sup> In addition, dose-dependent improvement was observed based on findings via diagnostic imaging of spots, wrinkles, and pores on the facial skin.\*

### Exercise endurance in postmenopausal women\*

Sugawara and colleagues reported effects of Theracurmin on central arterial hemodynamics.\*<sup>23</sup> The aim of this pilot study was to test the hypothesis that the regular endurance exercise combined with daily curcumin ingestion supports healthy left ventricular (LV) afterload to a greater extent than monotherapy with either intervention alone in postmenopausal women using a randomized, double-blind, placebo controlled, parallel manner.\* Forty-five women with comparable baseline cardiovascular hemodynamic variables were randomly assigned to four interventions: Placebo (n = 11); Theracurmin (150 mg curcumin/day; n = 11); exercise training with placebo (n = 11); or exercise training with Theracurmin (n = 12). Theracurmin or placebo capsules were administered for 8 weeks. Aortic blood pressure (BP) and augmentation index (AIx), an index of LV afterload, were

evaluated by pulse wave analysis from tonometrically measured radial arterial pressure waveforms. Researchers found that regular endurance exercise combined with daily Theracurmin ingestion supported normal LV afterload to a greater extent than monotherapy with either intervention alone in postmenopausal women.\*

#### *Muscle fatigue after endurance exercise\**

A small pilot study of young, non-conditioned males (n=14) was undertaken to ascertain the effects of Theracurmin on muscle recovery after intense exercise.<sup>24</sup> Participants took two doses of Theracurmin, 150 mg each, once immediately before and then once 12 hours after maximal biceps flexion exercise (flexion from 150°, 50 repetitions). The percent change in maximal voluntary muscle contraction (an indicator of muscle strength and degree of recovery) was found to be significantly greater (p < 0.05) in the Theracurmin group than in the placebo group.\* Theracurmin also improved biochemical indices of muscle recovery as compared to placebo, including creatine kinase (CK), lactate dehydrogenase (LDH), and creatine kinase MB (CK-MB) 72 hours after exercise.\* The differences for CK and CK-MB reached statistical significance (p < 0.05). This study has not yet been published.<sup>24</sup>

#### *Ongoing research on Theracurmin*

At the time of this writing, two additional clinical trials of Theracurmin were ongoing. The first, sponsored by the M.D. Anderson Center, is a Phase I study evaluating the effect of Theracurmin in individuals for whom one or more prior therapies have failed or for which there is no established standard of care therapy.<sup>24</sup> The second is an 18-month study sponsored by the University of California, Los Angeles (UCLA) evaluating the effects of Theracurmin on cognitive function in 132 subjects (aged 50 to 90 years) with mild memory complaints associated with aging.<sup>26</sup>

### Conclusion

Theracurmin® is an innovative colloidal preparation of turmeric with dramatically enhanced absorption and bioavailability demonstrated in humans and animals. Theracurmin is effective and well-tolerated. It is the most bioavailable turmeric product available, with absorption at least 27 times higher than standard curcumin.

Theracurmin HP is NSF Certified for Sport. Available as Theracurmin HP in a 60 and 120 count bottle size. In addition to this formula, you can find Theracurmin HP in several other Integrative Therapeutics™ products:

- Glutamine Forté (70676)
- Glycation Manager™ (70675)
- ProThrivors™ Wellness Brain (10530)
- ProThrivors™ Wellness Flavonoid Complex (10490)
- Sleep Reset™ (10285)

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### Supplement Facts

Serving Size 2 capsules

Amount per 2 capsules		%DV†
<b>Total Carbohydrate</b>	<1 g	<1%†
Theracurmin® (enhanced bioavailability water-dispersible turmeric (Curcuma longa) rhizome complex) providing 30% curcumin (180 mg)	600 mg	**

†Percent Daily Values (DV) are based on a 2,000 calorie diet.

\*\*Daily Value not established.

**Other ingredients:** cellulose, maltose, hydroxypropyl methylcellulose (vegetable capsule), gum ghatti, ascorbyl palmitate, dextrin, citric acid, silicon dioxide

**Contains no:** salt, yeast, wheat, gluten, soy, dairy products, artificial colors, flavors, preservatives or ingredients of animal origin.

If pregnant, nursing, or taking prescription drugs, consult your healthcare professional prior to use.

**Recommendations:** Take as recommended by your healthcare professional. Typical dose is 2 capsules or more once per day for 7 days; may reduce dosage to 1 capsule per day thereafter, or as recommended by your healthcare professional.

**Integrative Therapeutics**

60 CT - 10630

120 CT - 11332

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