

The background of the cover features a close-up of ginger root in the upper right and a large pile of bright orange-yellow curcumin powder in the lower left. A wooden spoon, also filled with the powder, lies in the foreground. Two overlapping circles, one white with an orange border and one solid orange, are positioned in the upper right quadrant, framing the title and author information.

# Curcumin Nature's Miracle Spice

By Robert Redfern  
With Studies & Extracts  
for Health Professionals

# CONTENTS

Introduction – Uncovering Curcumin	3
What Exactly is Curcumin?	3
History of Use	4
Strong Pharmacological Properties of Curcumin	4
Curcumin's Role in Fighting Cancer and its' Therapies	6
Skin Cancer and Conditions of the Skin	9
Arthritis and Inflammation	10
Alzheimer's Disease	11
Digestive System Disorders	12
Heart Disease	13
Lung Disease	14
Liver Damage	15
Bacteria, Viruses, Fungi, and Parasites	16
Improvements in Curcumin's Absorption and Bioavailability	17
Meriva®	17
BCM-95®	18
Conclusion	21
Research and References	22

### Introduction – Uncovering Curcumin

When you don't know where to look, finding Curcumin can be a challenge! Once you discover Curcumin and all its' health-promoting benefits, finding it and using it will become second nature. So where is this miracle of nature to be found? Curcumin is hidden as a chemical compound in the much more familiar spice, known as turmeric. Curcumin is what gives the spice its' deep golden yellow hue.

Tumeric is one of the most cherished and commonly used spices in Indian and Thai cuisine. It has been used for thousands of years. The spice's aesthetically appealing yellow tint is used to convey color, as well as flavor in preparing a multitude of dishes, especially curry, which is a foundation of the Indian diet.



### Where else can turmeric and the versatile compound Curcumin found?

- Prepared yellow mustard
- Garam masala, a mixture of ground spices common to India
- Indonesian foods in the form of chili paste, yellow rice and various meat dishes
- Thai dishes with curry sauces
- Caribbean curries, including pumpkin
- As an added color for many foods: dairy products, cereals, packaged fruit and vegetable products, candy, soups, fats, oils, pickles, sauces, protein shakes, beverages, essential oils, and edible ices

Even though Curcumin is found within turmeric, it has its' own unique qualities and characteristics.



### What Exactly is Curcumin?

Curcumin is a phytochemical and belongs to a class of compounds known as curcuminoids. Other than being an important component of turmeric, Curcumin is a natural polyphenol, in other words a group of chemicals which provide many health benefits.

Curcumin is a standardized extract from the dried root of the curcuma plant, the root being the portion used for medicinal purposes. The curcuma plant is a perennial originating from India and is found throughout Southern and Eastern Asia. The plant, a member of the ginger family, can mature and grow up to 3 feet tall.



### History of Use

Historically, spices, including turmeric and the Curcumin within it, had many uses and spanned many cultures. Turmeric was used as a folk remedy as well as a cure in ancient Ayurvedic medicine, where it was considered a symbol of prosperity.

Ayurveda means "the knowledge for long life," while ayurvedic medicine itself, native to India, is a combination of alternative and traditional medicine. Curcumin was used in India as a primary anti-inflammatory herb and as a relief for stomach irritation.

### Other recorded uses included facilitating the healing of:

- Wounds (external)
- Sprains
- Digestive distress
- Rheumatism (arthritis)
- Liver disorders
- Coughs
- Colds
- Burns
- Edema
- Parasites (dysentery)
- The liver



Turmeric was also traditionally used in India for preserving food and dyeing woven and knitted materials.

Turmeric was not only specific to Indian culture, but was included in Traditional Chinese Medicine (TCM) to:

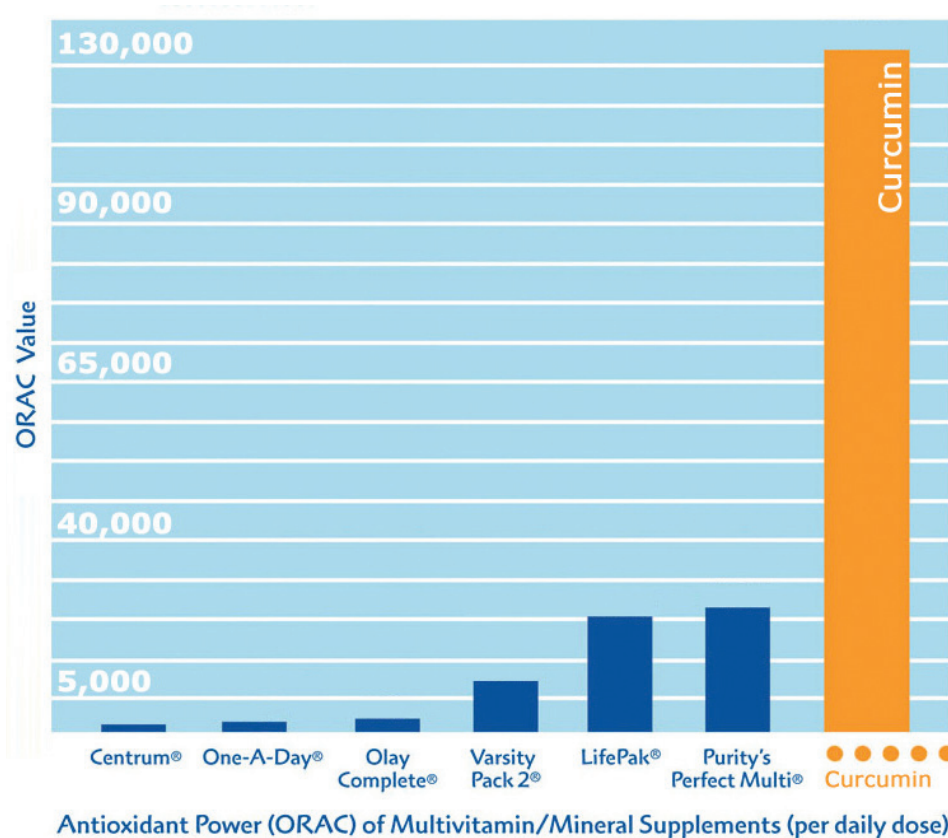
- Treat liver and gallbladder problems
- Stop bleeding
- Ease chest congestion and menstrual discomfort

# Strong Pharmacological Properties of Curcumin

This brings us to Curcumin's use in the present day and the research surrounding it. Curcumin is known for its' strong pharmacological properties.

### Curcumin is:

- An antioxidant
- Anti-inflammatory
- Anti-bacterial
- Anti-viral
- Anti-fungal



Curcumin also has anti-cancer properties due to its' high level of antioxidants, lending to its' ability to eliminate free radicals and heal the damage they leave behind.

Turmeric rates 8th out of 326 foods on the antioxidant capacity ORAC scale (oxygen radical absorbance capacity) with a score of 127,068. The ORAC score measures the antioxidant capacity of foods and supplements and was developed by scientists at the National Institutes of Health.

Foods and supplements ranking higher on the ORAC scale are believed to neutralize free radicals more effectively. The free-radical theory of aging tells us antioxidants slow down oxidation and the free radical damage that contributes to aging and disease, including cancer.

Free radicals are joined by inflammation as the two main culprits behind the vast majority of sickness that ails us today. It creates what we know as disease or dis-ease, meaning the body is not at ease.

### The consequences of this?

- Cancer (cell growth)
- Skin cancer and conditions of the skin: acne and psoriasis
- Arthritis
- Alzheimer's disease
- Digestive system disorders
- Heart disease
- Lung disease
- Liver damage
- Bacteria, viruses, fungi, and parasites

Can spices heal, cure, and offer relief for these health consequences? How about part of a spice, a single component? The research shows Curcumin, the active ingredient concentrated in turmeric, can do all of these things.

What role does Curcumin play in accomplishing these goals?

## Curcumin's Role in Fighting Cancer and its' Therapies

Curcumin can tell the difference between a cancer cell and a normal cell; so powerful it can stop chemicals in their tracks; and so strong it can enable DNA to walk away from lethal doses of radiation virtually unscathed. With over 200 kinds of cancer lurking out there this is good news!

The most recent statistics (2009) from the Center for Disease Control (CDC) tell us cancer kills over half a million people a year in the United States alone, only slightly behind heart disease as the number one killer. The Office for National Statistics tells us England and Wales's second leading cause of death is also from cancer with 141,446 deaths in 2010.

According to the organization Cancer Council Australia, at least one in three cancer cases are avoidable and could be prevented by simply choosing a healthy lifestyle.



What about the other two out of three cases or when lifestyle isn't effective?

### Curcumin is effective and can help!

#### Curcumin works to fight cancer by:

- Working as a kinase inhibitor
- Protecting against estrogen-mimickers
- Interfering with cytokines
- Activating apoptosis
- Enhancing immunity
- Stopping angiogenesis

### Kinase Inhibitor

One of the hottest areas in oncology drug development is in the area of kinase inhibitors. Kinases are the equivalent of phone lines into cancer cells. There are over 2000 known protein kinases, or phone lines. These lines carry messages from the outside of a cell into the inside of a cell where the DNA command center is located. Block these lines, and you can effectively stop the growth of some types of cancer cells.

What does Curcumin do? Curcumin effectively blocks some of these lines. In cells treated with Curcumin, certain "grow" signals are blocked from reaching the cell, thus inhibiting the growth of certain cancer cells. It turns out that the structure of Curcumin enables it to inhibit multiple kinases.

While drug companies rush to try to recreate safe, patentable, chemical versions of this structure, Curcumin sits ready and available for use. Blocking kinases, however, is only one of Curcumin's anti-cancer effects.



### Estrogen Mimicker

One of the things that sets Curcumin apart from most other anti-cancer supplements is Curcumin can actually block chemicals from getting inside cells.

More importantly, is Curcumin's ability to interfere with pesticides that mimic estrogen. These include DDT and dioxin, two extremely toxic chemicals that contaminate America's food and water.



## Curcumin Nature's Miracle Spice

Curcumin competes for the same cellular doorway as estrogen and estrogen-mimickers and has the power to block access to the cell, thereby protecting the cell from unwanted intruders.

Just like estrogen, estrogen-mimicking chemicals promote the growth of breast cancer. In a study on human breast cancer cells, Curcumin reversed growth caused by 17 $\beta$ -estradiol, (estrogen hormone replacement) by 98%. Curcumin also blocked DDT's growth-enhancing effects on breast cancer by about 75%.

Two other estrogen mimickers were tested for their ability to enhance breast cancer. Chlordane and endosulfane together make breast cancer cells grow almost as much as 17 $\beta$ -estradiol. Curcumin can reverse that growth by about 90%. Adding the soy phytochemical, genistein, causes a 100% growth arrest!

This unique ability of Curcumin to block other chemicals has been documented. It has been tested against paraquat (weed killer), nitrosamines (found in cooked meat and "lunch" meats), and carbon tetrachloride (a solvent in varnish and other products). In all cases, Curcumin was able to block the chemical's effect. The benefits of this are evident in a study where mice were treated with diethylnitrosamine. All mice treated with this chemical usually develop liver cancer; however, when treated with Curcumin, the percentage of animals developing cancer went from 100% to 38%, with the number of tumors dropping by 81%!

## Cytokines

Curcumin blocks the well-studied nuclear factor, NF- $\kappa$ B. NF- $\kappa$ B is activated by chemical messengers known as cytokines. Cytokines help the immune system, but they also activate signals that tell cells to multiply and grow, including cancer cells. Curcumin interferes with those signals and effectively stops the growth of cancer cells by kinase pathways.

Curcumin possesses several other anti-cancer benefits that make it useful for cancer prevention. One of its most recognized features is its antioxidant action. Turmeric, which remember contains Curcumin, has traditionally been used as a food preservative for good reason: it keeps food from going rancid or oxidizing. And just as turmeric (Curcumin), keeps oxygen from turning meat rancid, it protects our own bodies from damaging free radicals. Free radicals promote cancer by damaging DNA and activating genes. Radiation damages DNA partially through free radicals. In a recent study, it was demonstrated that under laboratory conditions, Curcumin could protect bacteria from a lethal dose of radiation almost perfectly. Bacterial DNA emerged virtually intact.



## Apoptosis

Other studies using cancer cells grown in vitro have demonstrated Curcumin's ability to prompt apoptosis, or programmed cell death, among leukemia, B lymphoma, and other cancerous cells. The process of apoptosis creates apoptotic bodies (cell fragments) that white blood cells are able to take over very quickly and eliminate before any of what's inside the cell can spill out and contaminate the surrounding cells.





### Immunity

Curcumin can also help the body fight off cancer should some cells escape apoptosis. When researchers looked at the lining of the intestine after ingestion of Curcumin, they found that certain types of immune cells were greater in number.

In addition to this localized immune stimulation, Curcumin also enhances immunity in general. Researchers in India have documented increased antibodies and more immune action in mice given Curcumin.

### Angiogenesis

All of the above actions of Curcumin stop cancer before it has a chance to become detectable. If cancer grows to the point of a detectable tumor, Curcumin can still have an effect. Certain enzymes enable tumors to create a blood supply for themselves. Known as "angiogenesis," this phenomenon allows tumors to invade surrounding tissue and spread. Curcumin slows the ability of these tumors to create their blood supply, ultimately starving and killing them.

Curcumin's preventative and curative effects on cancer and some of its' therapies are powerful and proven. The actions of Curcumin have been the subject of presentations at major meetings on cancer research and the object of study by researchers at the most prestigious universities in the world.

If Curcumin were a drug, it would be hailed as one of the best all-around cancer drugs ever invented. As it is, Curcumin is a phytochemical with impeccable credentials, thousands of years of use behind it, and a very small price tag. No wonder a host of drug companies want to imitate it.



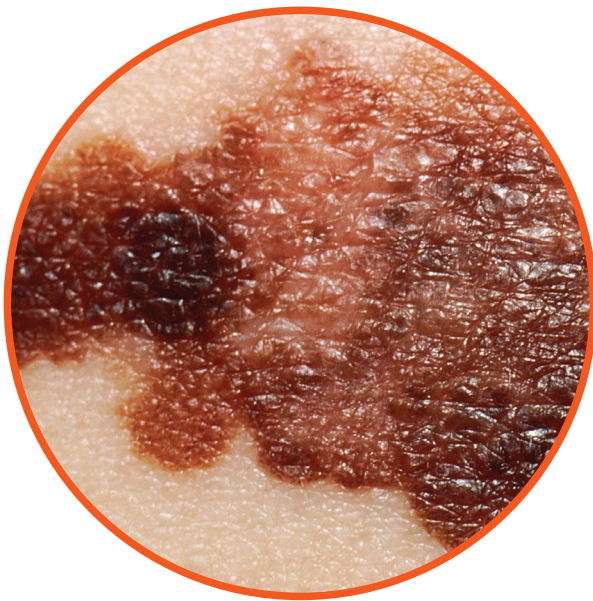
### Skin Cancer and Conditions of the Skin

The skin, being the largest organ of the body, is subject to inflammation and free radical damage just like any other organ in the body. These free radicals, when not kept under control, lead to skin cancer. Doctors diagnose roughly 53,600 people with melanoma every year, the most life-threatening form of skin cancer. The cancerous cells develop as irregularly shaped and colored moles on the surface of the skin. Skin cancer resists many chemotherapy treatments and can metastasize, spreading to other organs in the body.

Researchers from the University of Texas: M. D. Anderson Cancer Center in Houston discovered small doses of Curcumin not only stopped the growth of melanoma cells in the lab but also caused the cells to self-destruct. Unlike normal cells, cancer cells grow uncontrollably and do not usually self-destruct.

Dr. Bharat Aggarwal, (co-author of the research), and his colleagues believe that Curcumin blocks the signals a cancer cell needs to survive. David Fisher, director of the melanoma program at the Dana Farber Cancer Institute, agrees. Fisher believes looking at how Curcumin blocks these signals was one of the more important discoveries in this study, which will be published in the journal Cancer. This coincides with what we've already learned about Curcumin and preventing other cancers.

Dr. Aggarwal said Curcumin is intriguing to researchers because of its low toxicity. While most forms of chemotherapy cause serious adverse reactions in cancer patients, studies have shown that people can tolerate large amounts of Curcumin with no ill effects.



**Curcumin also has many uses in the dermatology venue and includes the prevention and/or treatment of:**

- Acne
- Wounds
- Burns
- Eczema
- Sun damage
- Premature aging from the sun
- Psoriasis

The use of Curcumin in treating psoriasis is a relatively new venture. The curcuminoids and volatile oils are believed to contain anti-inflammatory agents which operate by selective inhibition of phosphorylase kinase, an enzyme found in the epidermis. Significantly higher levels of phosphorylase kinase have been found to coincide with clinical activity of psoriasis.

Is there more? Yes. Indian women have used turmeric for thousands of years to give them their beautiful and flawless complexions.

### Arthritis and Inflammation

Inflammation is no more apparent than its' manifestation through arthritis. Arthritis hits many of us as we age. It is painful and often debilitating. A common resource for arthritis sufferers is to take some form of nonsteroidal anti-inflammatory drug, frequently known as an NSAID, e.g., ibuprofen, aspirin or naproxen. There are a multitude of harmful side effects associated with taking NSAIDs for relief.

#### These are just the most common ones.

- Nausea
- Vomiting
- Diarrhea
- Constipation
- Decreased appetite
- Rash
- Dizziness
- Headache
- Drowsiness
- Gastrointestinal bleeding



Now that you know the side effects do you actually know how NSAIDs work?

NSAIDs relieve inflammation by hindering the ability of the enzyme COX-2 to create inflammation. Along with that, the COX-1 enzyme is also inhibited. COX-1's job is to keep the lining of the digestive tract and blood vessels intact and safe. When this enzyme can't do its' job, ulcers may occur and blood vessels may leak.

Curcumin relieves pain and inflammation by working on the COX-2 enzymes too, but at the same time preserves healthy levels of COX-1 enzymes. Curcuminoids are a natural source of anti-inflammatories and are every much as strong and effective, if not more so, than steroidal and non-steroidal drugs, just without all the unwanted side effects.

NSAIDs were reduced by over 60% when people suffering from osteoarthritis of the knee were given Curcumin. An unexpected side effect? C-reactive protein, (CRP) a marker for inflammation and cardiovascular health, was dramatically reduced; 16 fold!

Where does all this inflammation come from in the first place? Inflammation is a result of a complicated series of events: actions and/or reactions, to tissue damage. This kicks the body's immune system into action. This tissue damage can be caused by any number of physical traumas, including surgery and disease.



While some inflammation is necessary to heal, chronic inflammation leads to chronic conditions e.g., arthritis. When curcumin's anti-inflammatory properties were tested in a clinical trial, patients with rheumatoid arthritis experienced dramatic improvement. The therapeutic effects were comparable to those obtained with phenylbutazone, another powerful NSAID. Curcumin has reduced markers of inflammation by almost 100% in certain studies, leading to relief and hope.

**Curcumin is not just for inflammation anymore either. It has been shown to actually help prevent cartilage from breaking down, therefore keeping arthritis from progressing.**

## Alzheimer's Disease

There is also hope in the field of Alzheimer's. Alzheimer's disease is the most common form of dementia, affecting millions of middle-aged and elderly adults worldwide. It is an irreversible disorder of the brain that progresses slowly, resulting in memory loss, erratic behavior, and cognitive dysfunction.



### How can Curcumin help?

What's unique about Curcumin," says Gregory Cole, associate director of the Alzheimer's Disease Center at the University of California, Los Angeles (UCLA), "is that it binds directly to beta-amyloid deposits in the brain and reduces their size."

Beta-amyloid deposits are the protein fragments that build up between the brain cells of people with Alzheimer's disease. These protein deposits (plaques) are responsible for the memory loss that is representative of the disease. The latest studies suggest that Curcumin might not only prevent the build-up of these plaques in patients already experiencing symptoms, but may also prevent the plaques from occurring altogether.

As early as 2001, UCLA found a low-dose of Curcumin as part of a treatment plan decreased the amount of plaque by almost half. "The prospect of finding a safe and effective approach to both prevention and treatment of Alzheimer's disease is tremendously exciting," said principal investigator Gregory Cole. Due to the promising results gained from animal studies, research has been prompted for studying humans. "There's real potential for Curcumin in treating brain diseases," concludes Cole.

Research also shows Curcumin, when compared with the powerful drugs being tested to battle Alzheimer's, fared better. Curcumin prevents the formation of the protein fragments due to its' low molecular weight and polar structure, allowing it to penetrate the blood-brain barrier and effectively bind to the beta amyloids.

In earlier studies the same research team found Curcumin's powerful antioxidant and anti-inflammatory properties. Scientists believe these properties help ease the Alzheimer's symptoms caused by oxidation and inflammation. These findings lead researchers to believe there is great potential for Curcumin to play a role in preventing people from developing Alzheimer's.



# Digestive System Disorders

Millions of people worldwide are also afflicted with some kind of digestive disorder, most of them undiagnosed and untreated. These afflictions can be mild to very serious, even life threatening.

Curcumin plays a strong role in the digestive system as well as a strong role in offering relief for many of these digestive disorders.

### Curcumin's role in the digestive system includes:

- Easing digestion
- Aiding in liver function
- Stimulating bile production in the liver and gallbladder, improving the ability to digest fats
- Reducing inflammation

### Curcumin's role as an anti-inflammatory is the key in relieving these disorders.

### Some of these disorders include:

- Colitis
- Crohn's disease
- Irritable bowel syndrome (IBS)

## Colitis and Crohn's Disease

Colitis and Crohn's disease are both inflammatory bowel diseases (IBD).

In Crohn's disease the small and large intestines are mostly affected. This is where Curcumin's anti-inflammatory response comes into play, as it stops the growth of additional blood vessels that would feed the inflamed area in the digestive tract. This process is called angiogenesis, the same process we learned about whereby cancerous tumors get their blood supply, enabling them to grow.

### When Curcumin was used to treat ulcerative colitis in a Japanese study with human subjects there were:

- Fewer episodic events
- Decreased side effects of:
  - o Excessive bleeding
  - o Ruptured colon
  - o Dehydration
  - o Liver disease



### Irritable Bowel Syndrome

The symptoms associated with irritable bowel syndrome fluctuate between loose stools and constipation, in addition to stomach cramping, bloating, and gas. A pilot study conducted on human subjects showed turmeric reduced abdominal pain and discomfort significantly, with 2/3rds of all subjects reporting improvements in symptoms, including a favorable shift in bowel patterns.

Whether simply seeking help with your digestive process or finding relief from a digestive disorder, Curcumin can do both!

### Heart Disease

Even more people are affected by heart disease than digestive disorders. Heart Disease is the leading cause of death in the western world. Our lifestyle of excess and lack of physical activity have contributed to our clogged arteries, our high cholesterol levels and our general lack of well-being.

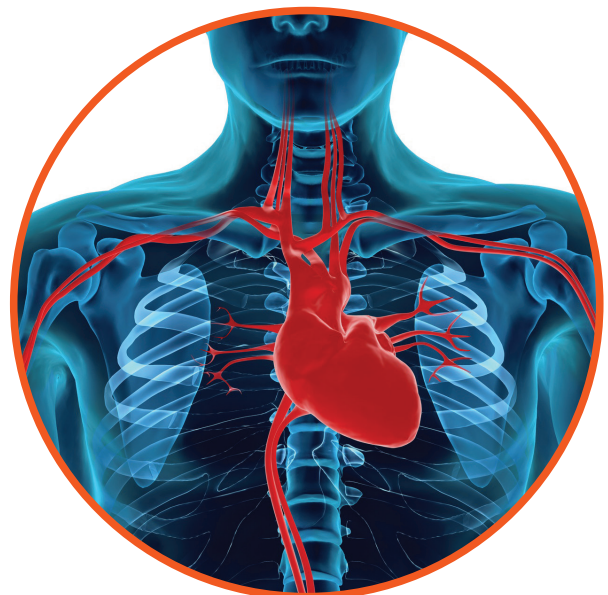
Some of the most intriguing new research on Curcumin's potential benefits involves its apparent ability to improve cardiovascular health. As with many of Curcumin's protective actions, this ability to improve circulatory system function may be due to its powerful antioxidant activity. Late last year, several reports detailed Curcumin's ability to protect test animals against a variety of conditions that model heart disease in humans.

Atherosclerosis is a major cause of heart disease and may also lead to stroke. It begins gradually, as cholesterol and other lipids (fats) deposit on arterial walls and form damaging plaques. As plaques grow, vessel walls may eventually thicken and stiffen, restricting blood flow to target organs and tissues. When atherosclerotic plaques restrict blood flow to the heart, depriving cardiac muscle of vital oxygen and nutrients, coronary tissues die. Angina and heart attack are the result. Since Curcumin is a naturally occurring, well-tolerated antioxidant that is capable of destroying the dangerous free radicals that lead to peroxidation (the breakdown of lipids through oxidation), it would appear that it holds enormous potential in the fight against heart disease.

Curcumin also raises HDL ("good") cholesterol levels, even as it reduces LDL ("bad") levels. In a small study of human volunteers, researchers reported a highly significant (29%), increase in HDL among subjects who consumed one-half gram (500 mg) of Curcumin per day for seven days. Subjects also experienced a decrease in total serum cholesterol of more than 11%, and a decrease in serum lipid peroxides of 33%. Further human studies are needed, but these preliminary findings are promising.

#### What might the future hold in terms of preventing and treating heart disease?

It may include Curcumin instead of the statins and other prescription drugs being currently used. Compare the natural effects and inexpensiveness of Curcumin to the cost and side effects of using dangerous pharmaceuticals!



### Lung Disease

Curcumin's role in protecting the lungs was discovered when a scientific French review looked at using the compound to protect lungs from acute and chronic diseases. They came to the conclusion that there has been surmounting evidence over time that Curcumin is therapeutic as well as protective in a multitude of lung diseases.



**Studies utilizing Curcumin to treat lung fibrosis demonstrate that Curcumin decreases lung injury and fibrosis created by:**

- Radiation
- Chemotherapeutic drugs
- Toxicants

**Information obtained from other research studies support Curcumin's protective role in:**

- Chronic obstructive pulmonary disease
- Acute lung injury
- Acute respiratory distress syndrome
- Allergic asthma

**And a therapeutic role in treating:**

- Inflammation
- Oxidative stress

### Liver Damage

The liver is an organ which you could call a multi-tasker as it has multiple functions. The liver plays a key role in digestion.

#### The liver's role in digestion is to:

- Metabolize nutrients absorbed from the small intestine.
- Produce and secrete bile into the small intestine to facilitate fat digestion.

#### What else does the liver do?

- Supplies a variety of chemicals the body needs to operate efficiently.
- Detoxifies potentially harmful chemicals and drugs, including alcohol.

As these functions are all crucial to good health it is imperative we protect our liver from damage.

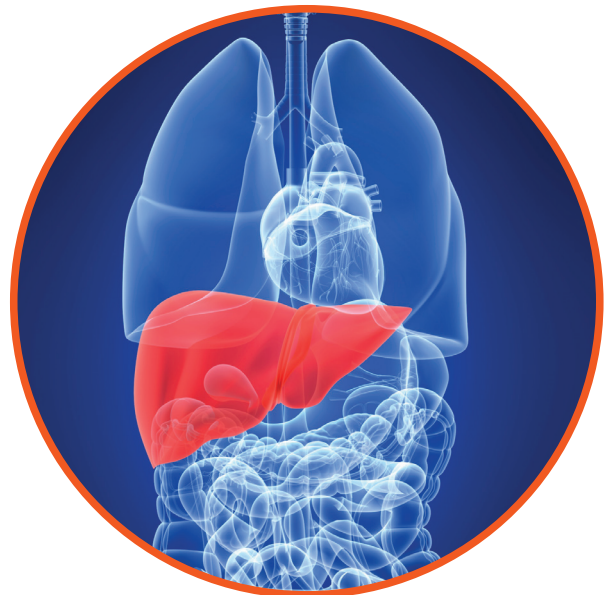
Curcumin may be the key. We've already learned NF-kB, a molecule which creates inflammation and is responsible for killing tissues, including tissues in the liver, may be blocked by Curcumin.

A good example of this scenario comes from an animal study conducted by Finland researchers. The study looked at how administering excessive alcohol and Curcumin at the same time affected inflammation and tissue damage in the liver. Their results showed the animals were free of any of the signs and symptoms usually associated with liver damage and alcoholism.

Another animal study looked at animals with well over half of their livers missing. After curcumin was implemented new tissue appeared in some animals in as little as a day.

Curcumin also appears to be very protective against liver cancer. In a more recent study, the incidence of liver cancer was slashed by 62%, with the number of tumors decreasing by 81% in mice given curcumin four days before a carcinogenic chemical was administered.

Clearly, Curcumin has a role to play in protecting our liver and one day may play a bigger role in alcohol recovery, regeneration and cancer.



### Bacteria, Viruses, Fungi, and Parasites

Due to Curcumin's anti-bacterial, anti-viral and anti-fungal properties it has been used for centuries to fight off bacteria, viruses, fungi, and parasites. Curcumin's therapeutic use continues to the present day, still protecting us from these microbes. Taif University conducted a study using Curcumin to treat mice infected with parasites. There was a significant decrease in the parasite load of the mice.

After learning about some of Curcumin's beneficial roles in preventing and treating many of the things that ail us we need to know the best way to implement nature's miracle spice into our lifestyle.



# Improvements in Curcumin's Absorption and Bio-Availability

There's the old saying, "You are what you eat," but is that really accurate? Shouldn't the new saying be, "You are what you absorb?" Yes! No matter how well you eat or what miraculous supplement you take, if the absorption process is ineffective so are the nutrients you're taking in.

As beneficial as Curcumin is, inexpensive supplements contain only somewhere between 2-5% (if you're lucky) of the desired compound. Even then, can you actually absorb it? Probably not! Curcumin is highly effective when the body can utilize it; however, without a little help its' bioavailability is limited. Don't worry, there is a solution. Two, actually.

## The answers have been found in the form of:

- Meriva®
- BCM-95®

First, let's take a look at Meriva® what it is, what it does, and where it can be found.

## Meriva®

Meriva® is a patented formulation of Curcumin combined with soy lecithin for an overall content of 20% Curcumin. With almost 3000 pre-clinical investigations, Curcumin is one of the best investigated products of the whole biomedical literature.

A 2007 study published in the journal Cancer Chemotherapy and Pharmacology demonstrated the superior bioavailability of Meriva® compared to a standardized Curcumin extract in rats. Meriva® improved plasma levels of curcuminoids by 20-fold and levels of Curcumin in the liver increased by much more than 20 fold.



In a new comparative study in humans, the overall curcuminoid absorption was about 29-fold higher for Meriva® compared to the unformulated curcuminoid mixture. The improved absorption, and possibly a better plasma curcuminoid profile, might underlie the clinical efficacy of Meriva® at doses significantly lower than unformulated curcuminoid mixtures.

Studies show Curcumin 95%, an unformulated curcuminoid mixture with inherent poor absorbency, requires high doses to achieve the dramatic effects shown in Meriva® studies. Now CurcuminX4000™ resolves this dilemma with its unique high utilization formulation.

What's behind CurcuminX4000's™ superior, high utilization formulation? – Phytosome® technology. By definition, a phytosome is a complex of a natural active ingredient and a phospholipid. More specifically, phytosomes are plant extracts bound to phosphatidylcholine which is an essential component of human cells. Our bodies make phosphatidylcholine, but we can also get it from food and supplements. When taken orally, phosphatidylcholine is very well absorbed. To improve absorption, scientists at Indena found a way to attach Curcumin to phosphatidylcholine.

## The result?

### CurcuminX4000™!

When you take CurcuminX4000™ your body readily absorbs the phosphatidylcholine and the Curcumin attached to it, resulting in more Curcumin reaching the cells. In a recent study, 450mg of CurcuminX4000™ delivered the equivalent benefits of 4000mg of ordinary Curcumin 95% capsules. Each capsule of CurcuminX4000™ contains 200mg of highly effective Curcumin Phytosome®. At 20-45 x better utilization than Curcumin 95%, CurcuminX4000™ is the most powerful and cost effective Curcumin supplement available.

### Superior Bioavailability

A 2007 study published in the journal Cancer Chemotherapy and Pharmacology demonstrated CurcuminX4000™'s superior bioavailability compared to a standardized Curcumin extract. This animal study noted a significantly greater amount of Curcumin in the blood and tissues after dosing with CurcuminX4000™. A human study compared blood levels of Curcumin after dosing with 4 grams of a standardized curcuminoid extract compared to 450mg of CurcuminX4000™. Similar blood levels of Curcumin were found in all participants.

**Now, let's take a look at BCM-95®, what it is and how it works.**

### BCM-95®

**BCM-95® is 100% Natural and:**

- Has undergone a toxicity Study (toxicity not detected)
- Has a Patent Pending
- Is undergoing various clinical studies and long-term plans
- Has a high ORAC value (+13,000)

As compared to

**Turmeric 95% Extract, which has:**

- Poor bioavailability
- Major concerns on retention (up to 4-5 hours)
- Low ORAC value (2,000 – 4,000)

### Life Extension's Studies and Findings

According to the Life Extension website, the Life Extension Foundation is the largest organization dedicated to investigating every method of extending life. The Life Extension Foundation is a nonprofit, tax-exempt organization whose goal is to conquer the aging process within the next decade. The foundation has long recognized Curcumin and its' benefits to health.

Life Extension has also recognized the limitations of Curcumin absorption and has sought out and reviewed many products looking for one with a high absorption rate. Life Extension discovered a formula through a clinical study which reported having a 96% absorption rate as compared to a 50-60% absorption rate from pure Curcumin.

The foundation conducted their own independent study with human participants and found almost identical results.



### The formulation?

### BCM-95®!

The specific details of the studies showed BCM-95® was rapidly absorbed, peaked at one hour, peaked even higher at 4.5 hours, and by 8 hours was still in the blood. BCM-95® delivered almost seven times more Curcumin than the other two formulas tested: plant-bound Curcumin extract with piperine, and ordinary Curcumin extract.

**When you're looking for a source of Curcumin with BCM-95®, choose Serranol®.**

**Serranol® combines BCM-95® in the form of Bio-Curcumin® with:**

- Ecklovica Cava Extract
- Serrapeptidase (Serrapeptase)
- Vitamin D3



We already know the benefits of BCM-95® for absorption but what about the other benefits of Bio-Curcumin® and the other ingredients in Serranol®?

- **Bio-Curcumin®** is one of the best natural anti-inflammatory herbs that protect cells and tissues from inflammation, while strengthening the immune system. It has also been studied for its anti-bacterial, anti-viral, and anti-fungal properties.
- **Ecklonia Cava Extract** - People throughout Asia have consumed Ecklonia Cava Extract, a species of edible brown algae, for centuries. Harvested from the coastal waters of Japan, Korea and China, all studies indicate ECE offers outstanding health benefits.
- **Serrapeptidase (Serrapeptase)** - is a multi-functional, proteolytic enzyme that dissolves non-living tissues such as fibrin, plaque, blood clots, cysts, and inflammation in all forms – without harming living tissue. Serrapeptidase helps promote a healthy inflammatory system and supports your whole body including the digestive tract, colon, arteries, lungs, joints, and anywhere blockages/inflammation need resolving.
- **Vitamin D3** - is critical to keeping your immune system strong. The cells that make up the immune system contain vitamin D3 receptors. If there is insufficient vitamin D3 present to bind with receptors, immune cells become weak and cannot protect the body from infections. Vitamin D3 deficiency is quite common in individuals because it cannot be stored in the body, making replenishment through daily supplementation vital to immune health.

This new super nutrient formula is promising to be a major nutritional breakthrough. This unique formulation combines the two best known anti-inflammatory ingredients: Serrapeptase and Curcumin 95%, with the strong calming effects of Ecklonia Cava and the immune boosting power of Vitamin D3.

## Curcumin and Iron

Curcumins latest claim to fame, and another reason to take Serranol® is its' role as a powerful iron chelator (binder). Excess iron in the body affects the liver, the heart, and the brain, creating free radicals along the way. Curcumin facilitates the body's natural iron binder, ferritin, to escort iron away from tissues.

An unprecedented UCLA study showed a strong link between the accumulation of excess iron in brain tissue and neurodegenerative brain disorders, e.g., Parkinson's and Alzheimer's disease. This correlates to a lower risk of contracting a neurodegenerative brain disorder when intake of iron is limited.

Another recent discovery found Curcumin's iron-chelating capacity facilitated the restoration of the body's own DNA repair mechanisms. This finding tells us there we have yet another way to protect our damaged neurons.

Another unrelated benefit of reduced iron in the body: Curcumin can stop the growth of certain microorganisms, in this instance, yeast, by taking away their means of reproducing; iron!



### Conclusion:

Curcumin's strong pharmacological properties and its' role in fighting and preventing disease makes Curcumin an essential component of your existing diet and supplementation protocol. Choose CurcuminX4000™ when you need a highly absorbable form of Curcumin or Serranol® when you're looking for a highly absorbable source of Curcumin and a little bit more.

Our recommendation for the very best and most effective Curcumin supplement on the market

go to: [www.curcuminx4000.com](http://www.curcuminx4000.com)

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