



TM

# PHYCOCYANIN

An Extract from *Spirulina platensis*

A PRODUCT OF HASH BIOTECH LABS PRIVATE LIMITED

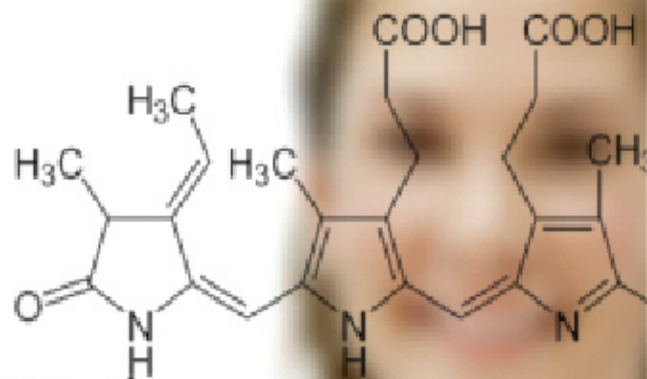


- ✓ Cancer suspected subjects
- ✓ Newly diagnosed cancer patients
- ✓ Patients already undergoing cancer treatment



Hash BioTech Labs

A Natural  
**Hepatoprotective**  
**Neuroprotective**  
**Anti-Cancer**  
**Molecule**



Introducing first time ever in the world, **PHYCOCYANIN**, a revolutionary wonder molecule for cancer care and support!

Biotech  
INNOVATION

Dietary  
SUPPLEMENT

First in the World to introduce  
**PHYCOCYANIN - the wonder molecule.**

**NutraCulture™**  
the culture for healthy living



# PHYCOCYANIN

An Extract from *Spirulina platensis*  
A PRODUCT OF HASH BIOTECH LABS PRIVATE LIMITED

A REVOLUTIONARY INNOVATION TO  
**FIGHT  
CANCER**

Supported By Doctors,  
Cancer Specialists And Experts

**PHYCOCYANIN™** is a natural dietary supplement dedicated to assisting individuals who are undergoing cancer therapies including chemotherapy and radiation. Besides, it also has cancer fighting and cancer preventive attributes of its own. **PHYCOCYANIN™** is a research innovation introduced by a team of world class researchers at Hash Biotech Labs, who harnessed the power of this wonder molecule from *Spirulina platensis*, one of the oldest algal species on earth. Our advanced high through put technology evolving from the combination of the latest medical research and the hidden powers of the natural microalgae has resulted in this specialized anti cancer dietary supplement that is a promising support in cancer fight. **PHYCOCYANIN** may be used to prepare for and ease negative symptoms during treatment as well as help the body revive and rejuvenate post treatment. **PHYCOCYANIN™** is being presented with the essential levels of purity and consistency to combat cancer as well as other related medical complications arising due to cancer onset and to meet the unique needs of cancer prevention attributes.

## WHAT IS PHYCOCYANIN?

Phycocyanin is an important molecule present in *Spirulina platensis*. It is a unique anti-cancer and cancer preventive molecule which has an excellent performing profile based on research proven scientific accreditations. It is a natural, water soluble and non-toxic molecule with potent anti oxidant, anti-inflammatory and anti-cancer properties. Various research studies also support strong cytoprotective, hepatoprotective and neuroprotective profile of phycocyanin. (Cheng and Wong 2008; Romay et al.2003; Vadiraja et al 1998)

**PHYCOCYANIN™** has 100% natural c-phycocyanin.

## Why PHYCOCYANIN™?

In the current times where dissipated lifestyle and other counting factors such as dietary, physical, mental mismanagements, drug administration intoxicifications in the form of chemotherapies and chemical toxicities are adding up to the cumulative risk of cancer occurrence, consumption of **PHYCOCYANIN™** is essentially required. **PHYCOCYANIN™** helps fight and revive against cancer and address other similar conditions which may deteriorate the quality of health. It provides protection and vitality to the body by boosting the immune system. Due to its strong anti-oxidant properties it detoxifies and rejuvenates the over all health profile.

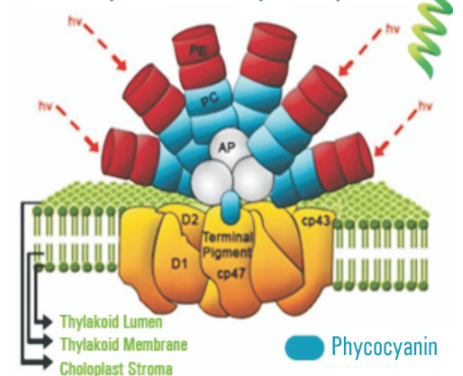
**PHYCOCYANIN™**  
IS SAFE

**PHYCOCYANIN™** is naturally designed to meet the unique needs of cancer prevention attributes and is being presented with the essential levels of purity and consistency. Zero toxicity and accomplished safety profiles of this wonder molecule, makes it a choice of health-conscious individuals as well as cancer fighting subjects without any hesitation.

**PHYCOCYANIN** has been acknowledged and recommended by oncologists and other medical experts. Thus far, many cancer specialists and other health-care providers have come up to recommend the wondrous **PHYCOCYANIN™** for cancer combating as well as for general rejuvenation.

**PHYCOCYANIN**  
RECOMMENDATIONS

Structure of PHYCOCYANIN embedded inside Phycobilisome of *Spirulina platensis*



The structure of phycocyanin consists of 2 dissimilar  $\alpha$  and  $\beta$  protein subunits of 17kDa and 19.5kDa respectively with one bilin chromophore attached to the  $\alpha$  subunit and two to the  $\beta$  subunit (Mc Carty 2007). Phycocyanin is 100% natural and no toxicity or side effects have been reported.

natural ANTI-INFLAMMATORY

# ANTI CANCER AND CANCER PREVENTIVE

## ATTRIBUTES OF PHYCOCYANIN

### ANTI-CANCER

- ☑ Inhibits tumor cell proliferation
- ☑ Induces tumor cell differentiation
- ☑ Induces apoptosis
- ☑ Inhibits tumor invasion
- ☑ Antimetastatic

## PHYCOCYANIN

### CANCER PREVENTION

- ☑ Activates Anti-inflammatory Modulators
- ☑ Induces Phase-II Enzymes
- ☑ Inactivates Phase-I Enzymes

## PREVENTION AND PROTECTION AGAINST CANCER

## PHYCOCYANIN and its effect on Reactive Oxygen Species (ROS), Apoptosis, Cyclo-oxygenase 2 (COX-2), Bcl-2

### HOW DOES PHYCOCYANIN PROTECT US AGAINST CANCER?

Cancer cells are those cells where the DNA has been altered thus causing uncontrolled division (an effect resulting from oxidative stress in most cases). Cancer cells by themselves are also known to generate reactive oxygen species endogenously to significant amounts which may be the cause of their excessive growth, elucidating the relation between the risk of carcinogenesis and reactive oxygen species (Szatrowski and Nathan, 1991)

Phycocyanin induces apoptosis in the existing and proliferating cancer cells and being a natural antioxidant, it also helps getting rid of any cancer promoting oxidative stress. Phycocyanin lowers the amount of cyclooxygenase-2 which is upregulated in cancer cells. It is established that Phycocyanin induces apoptosis in cancer cells by changing the Bcl-2/Bax ratio (Bcl-2 is an anti apoptosis protein, Bax is a pro-apoptotic protein, the ratio of Bcl-2/Bax represents the degree of apoptosis) and the release of Cyt-c in the cytosol (Lu et al, 2011).

The most widely studied effects of phycocyanin are its anti cancerous & apoptotic effects and cancer preventive antioxidant capacity in addition to its free radical scavenging ability (Romay et al., 1998). Phycocyanin is able to scavenge free radicals in the cells, protecting cells from damage which prevents or lessens the severity of a disease (Wang et al., 2007). Studies have shown that phycocyanin is an efficient scavenger of oxygen free radicals (Bhat et al, 2001) and also reacts with other oxidants of pathological relevance such as HOCl and ONOO- thus proving that the therapeutic use of phycocyanin appears to be promising. Phycocyanin is one of its kind natural molecule which has an established promising value as a cancer preventive moiety.

## THE HUMAN BODY, OXIDATIVE STRESS AND PHYCOCYANIN

Many problems that affect health and well being are caused by oxidative stress. This is characterized by excessive formation of ROS (Reactive Oxygen Species) that cannot be counteracted by one's normal antioxidant defense system. In order to protect the body against the consequences of oxidative stress, a successful approach consists of improving one's antioxidant profile. Therefore adding additional natural antioxidants is helpful to prevent free radical-induced cell damage.

It has been demonstrated that phycocyanin has significant antioxidant and radical scavenging properties alongside its easy digestibility and water solubility, thus becoming a possible natural agent for reducing the harmful effects of oxidative stress without any risk or toxicity. Some of the other beneficial and important characteristics of Phycocyanin are as follows:

1. A pronounced cyto- and tissue-protective potential, in particular against oxidative stress.
2. Supports a healthy inflammatory response and neurological health.
3. An anti-oxidant potential due to multi-site actions such as neutralizing ROS.

### ADDITIONAL MANIFOLD BENEFITS OF PHYCOCYANIN

PROTECTING THE VITALITY OF CELLS AND TISSUES

IMMUNE SYSTEM BOOSTING AND REVITALIZING

ANTI-OXIDANT AND REJUVENATING

PROTECTION AND DETOXIFICATION OF LIVER AND KIDNEYS

# natural ANTI-CANCER

**NATURAL  
ANTI INFLAMMATORY**

Anti-inflammatory activity of phycocyanin both in-vivo & in-vitro has been reported to occur by inhibition of cyclooxygenase-2 (COX-2) activity or by inhibition of platelet aggregation (Romay et al). Phycocyanin has been evaluated in numerous models and has been seen to have exerted anti-inflammatory effects in a dose dependent fashion. Phycocyanin reduced edema, histamine release, myeloperoxidase activity and the levels of prostaglandin and leukotriene in the inflamed tissues. These anti-inflammatory effects of phycocyanin can be due to its scavenging properties towards oxygen reactive species (ROS) and its inhibitory effects on cyclooxygenase-2 (COX-2) activity (Madyastha et al, 2000).

One of the most widely studied effects of phycocyanin is its antioxidant capacity and its free radical scavenging ability, both in-vivo & in-vitro (Romay et al., 1998). Anti-oxidant potential of phycocyanin is mainly attributed to its phycobilisome (chromophore) moiety (Patel et al., 2006) and partially to its apoprotein counterpart (Apt et al., 1995) as the former shows high degree of conjugation of double bonds which stabilizes free radicals. It is well known that reactive oxygen species (ROS) are involved in a diversity of important processes in medicine including inflammation, atherosclerosis, cancer, reperfusion injury etc. One way by which a substance can interfere with these processes is by acting as an antioxidant. Phycocyanin is able to scavenge free radicals in the cells, protecting cells from damage which prevents or lessens the severity of the diseases (Wang et al., 2007).

**NATURAL  
ANTI-OXIDANT**

**NATURAL  
HEPATOPROTECTIVE**

Lipid peroxidation mediated by ROS is believed to be an important cause of destruction and damage to cell membranes. Research suggests that phycocyanin is selective COX-2 inhibitor (Reddy et al., 2000), which significantly inhibits liver microsomal lipid peroxidation thus protecting the liver by preventing oxidative stress in hepatocytes acting as hepatoprotective molecule (Sathyasaikumar et al., 2007). Phycocyanin also inhibits microsomal lipid peroxidation induced by Fe+2 – ascorbic acid or the free radical initiator 2, 2' azobis (2-amidinopropane) hydrochloride (AAPH) (Bermejo-Bescos et al 2008). Furthermore, it reduces carbon tetrachloride (CCl4)- induced lipid peroxidation. The inhibition of COX-2 by phycocyanin is also known to be involved in its hepatoprotective effect on CCl4-induced liver damage.

Recent studies show that immune-modulatory properties, anti-inflammatory and antioxidant activities contribute to the neuroprotective effects of phycocyanin. A scientific study demonstrates that either the prophylactic or the therapeutic application of phycocyanin was able to significantly reduce the infarct volume, and also protect hippocampal neurons from death, induced by global cerebral ischemia/ reperfusion injury in gerbils (Penton-Rol et al, 2011). Studies reveal that phycocyanin is a potent platelet aggregation inhibitor with a potential to hamper arterial thromboembolism in conjunction with its neuroprotective ability.

**NATURAL  
NEURO PROTECTIVE**

**DETOXIFICATION AND  
ENZYME EXPRESSION**

Phycocyanin has been shown to increase the expression of essential enzymes and biochemicals related to the balanced function of liver and Kidney. Phycocyanin has been documented to modulate the activities of Cyt p-450, Superoxide Dismutase, Catalases, Alanine Transaminases, Aspartate Transaminases (Ivanova et al 2010).

**WHAT'S  
MORE?**

A further reason for using phycocyanin in cancer therapy is that the regular intakes of this molecule have been shown to boost immune responses. The particular types of immune cells involved in cancer control, cytotoxic T lymphocytes and NK cells, function more effectively with increased intakes of phycocyanin (Arias et al, 2011). Therefore, the likely benefits of PHYCOCYANIN™ in clinical cancer therapy especially when used as an adjuvant to chemotherapy are: improved response of cancers to chemotherapy, increased capacity of the immune system to fight cancer spread; and reduced risk that chemotherapy may eventually give rise to a new cancer.

**NO  
KNOWN  
TOXICITY**

Disclaimer: This product is not intended to diagnose, treat, cure or prevent any disease. All information, data & claims presented are taken from secondary sources like research papers etc. published in various National & International Journals and Standard Textbooks. Hash Biotech Labs Pvt. Ltd. makes no claim for their authentication. Please consult your doctor before taking any food supplement.

**natural HEPATO-PROTECTIVE**

# REFERENCES

## IMMUNE SYSTEM

Phycocyanin enhances secretory IgA antibody response and suppresses allergic IgE antibody response in mice immunized with antigen-entrapped biodegradable microparticles. – Department of Health and Nutrition, Kagawa Nutrition University, Chiyoda, Sakado, Saitama 350-0288, Japan

Phycocyanin boosts the immune system – In Japan, studies on mice suggests that phycocyanin raises lymphocyte activity and may increase survival of cancer-stricken organisms. – Iijima, N., Shimamatsu, H., et. Al. (inventors; Dainippon Ink x Chemicals assignee). Anti-tumor agent and method of treatment therewith. US Patent pending, ref. P1 150-726-A82679, App. 15 Sep 1982.

## ANTI OXIDANT AND FREE RADICAL SCAVENGING

C-phycocyanin: a biliprotein with antioxidant, anti-inflammatory and neuroprotective effects. – Departamento de Farmacologia, Centro Nacional de Investigaciones Cientificas, Apartado 6412, Habana, Cuba. – Curr Protein Pept Sci. 2003 Jun; 4(3):207-16

Analysis revealed the antioxidant and antiurolithic potential of phycocyanin thereby projecting it as a promising therapeutic agent against renal cell injury associated kidney stone formation. – Department of Medical Biochemistry, Dr. ALM Postgraduate Institute of Basic Medical Sciences, University of Madras, Taramani, Chennai 600113, India. – chem. Biol Interact. 2004 Aug 10; 149(1):1-7

C-phycocyanine are able to reduce the steady state concentration of the peroxy radicals. – Department of Chemistry, Faculty of Chemistry and Biology, Universidad de Santiago de Chile, Santiago, Chile. – Free radic boil Med 2000 Apr 1; 28(7):1051-5

Phycocyanin is able to scavenge OH and RO radicals. It also inhibits liver microsomal lipid peroxidation. – Pharmacology Department, National Center for Scientific Research, CNIC, Havana, Cuba. – Inflamm Res 1998 Jan; 47(1):36-41

Increase in phycocyanin content was related to an increase in the antioxidant activity in different fractions, and therefore phycobiliprotein phycocyanin is the component mainly responsible for the antioxidant activity. – Departamento de Farmacologia, Facultad de Farmacia, Universidad Complutense de Madrid, Spain. – Farmaco 2001 May-Jul; 56(5-7): 497-500

Study has demonstrated that phycocyanin, a biliprotein from spirulina platensis has the ability to inhibit the ONOO(-), a potent physiological inorganic toxin, hence has the potential to be used as a therapeutic agent. – Chemical Biology Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India – Biochem Biophys Res Commun 2001 Jul 13; 285(2):262-6

Phycocyanobilin is responsible for the majority of the antioxidative activity of phycocyanin and may act as an effective antioxidant in a living human body. – Takashi Hirata, Mikiya Tanaka, Masaki Ooike, Teppei Tsunomura & Morihiko Sakaguchi, Division of Applied Biosciences, Graduate School of agriculture, Kyoto University, Japan

## HEPATOPROTECTION AND DETOXIFICATION

C-phycocyanin significantly decreases Kupffer cell phagocytosis and the associated respiratory burst activity, effects that may contribute to the abolition of oxidative stress-induced TNF-alpha response and NO production by hyperthyroid state. – Centro de Investigaciones del Ozono, Centro Nacional de Investigaciones Cientificas, Ciudad de la Habana, Cuba. – Inflamm Res 2002 Jul; 51(7):351-6

Phycocyanin provides protection to liver enzymes – Department of Organic Chemistry, Indian Institute of Science, Bangalore, 560 012, India. – Biochem Biophys Res Commun 1998 Aug 19; 249(2):428-31

Antioxidant nature of C-phycocyanin protects the renal cell against oxalate-induced injury and may be a nephroprotective agent. – Department of Medical Biochemistry, Dr. AL Mudalia Post-Graduate Institute of Basic Medical Sciences, University of Madras, Taramani, Chennai-600 113, India. – Clin Chim Acta. 2004 Oct; 348(1-2):199-205

## CELLS AND BLOOD SYSTEM PROTECTION

Phycocyanin and polysaccharides enhanced bone marrow reproduction, growth of thymus and spleen and biosynthesis of serum protein. – Zhang Cheng-Wu, et. al. Effects of polysaccharides and phycocyanin from spirulina on peripheral blood and hematopoietic system of bone marrow in mice. Second Asia Pacific Conf. Ibid, April, 1994

Phycocyanin, a novel hypocholesterolemic protein derived from spirulina platensis, can powerfully influence serum cholesterol concentrations and impart a stronger hypocholesterolemic activity than SPC (Spirulina platensis concentrate) in animals. – Department of Applied Life Science, Faculty of Applied Biological Sciences, Gifu University, Gifu 501-1193, Japan – J Nutr. 2005 Oct; 135(10):2425-30

C-phycocyanin protected cerebellar granule cells from the apoptosis induced by deprivation. – Unitat de Farmacologia i Farmacognosia, Facultat de Farmacia, Nucli Universitari de Pedralbes, Barcelona, Spain. – Naunyn Schmiedebergs Arch Pharmacol 2001 Aug; 364(2):96-104

## ANTI CANCER

Small dosage of phycocyanin daily maintains or accelerates normal control cell functions that prevents generation of malignancy such as cancer or inhibits its growth or recurrence. – Dainippon Ink x Chemicals and Tokyo Kenkyukai (inventors and assignee). Anti-tumor agents containing phycobilin – also used to treat ulcers and hemorrhoidal bleeding. 1983, JP58065216 A 830418.

C-Phycocyanin, the major light harvesting biliprotein from Spirulina platensis is of greater importance because of its various biological and pharmacological properties. It is a water soluble, non-toxic fluorescent protein pigment with potent anti-oxidant, anti-inflammatory and anti-cancer properties. – Department of Animal Sciences, School of Life Sciences, University of Hyderabad, Hyderabad 500046, India. – Biochem Pharmacol. 2004 Aug 1; 68(3):453-62

Phycocyanin significantly inhibited the growth of human leukemia K562 cells. – Medical School, Nanjing University, Nanjing, 2/0093, PR of China.

Phycocyanin, a natural product, could be a possible chemotherapeutic agent through its apoptotic activity against tumor cells. – Centre for Cellular and Molecular Biology, Hyderabad 500 007, India – Mol Cancer Ther. 2003 Nov; 2(11):1165-70

The recombinant subunit of C-phycocyanin inhibits cell proliferation and induces apoptosis – Cancer Letters – Department of Biology, Georgia Cancer Center, Georgia State University, University Plaza, Atlanta, Ga30303. USA – Received 16 January 2006, received in revised form 31 March 2006, accepted 6 April 2006.

## ANTI INFLAMMATORY

The anti-inflammatory effect of microalgae spirulina was studied in Zymosan-induced arthritis in mice. The anti-arthritic effect exerted by spirulina as shown in this model may be at least partly due to the previously reported anti-inflammatory and antioxidative properties of its constituent, Phycocyanin. –Ozone International Center, Havana, Cuba – Mediators Inflamm 2002 Apr; 11(2):75-9

Phycocyanin may result, at least partially, from inhibition of prostaglandin E2 production and a moderate inhibition of phospholipase A2 activity. – Departamento de Farmacologia, Centro Nacional de Investigaciones Cientificas, CNIC, Habana, Cuba – Arzneimittelforschung 2000 Dec; 50(12):1106-9

Anti-inflammatory activity of phycocyanin extract in acetic acid-induced colitis in rats – Pharmacology Department, National Center for Scientific Research, PO Box 6990, Havan, Cuba

Phycocyanin exerts inhibitory effects on tumor necrosis factor-alpha (TNF alpha) and NO production which might be ascribed to the antioxidative properties of the biliprotein. – Department of Pharmacology, National Center for Scientific Research, Havana, Cuba – Arzneimittelforschung 2001 Sep; 51(9):733-6

Phycocyanin shows anti-inflammatory activity in four experimental models of inflammation. Its antioxidative and oxygen free radical scavenging properties may contribute, at least in part, to its anti-inflammatory activity. – Depto. Farmacologia, Centro Nac. Invest. Cientificas, CNIC, Habana, Cuba – Inflamm Res 1998 Aug; 47(8):334-8

All information, data and claims presented, are taken from secondary resources like research papers etc published in various National and International Journals and Standard Textbooks. Hash BioTech Labs Pvt. Ltd. makes no claim for their authentication.

**CANCER**  
is killing  
many people  
with every  
moment  
passing.  
**LET US**  
**FIGHT AGAINST IT!!!**

**PHYCOCYANIN™ is a proactive technology innovation in the field of medical sciences, targeting both cancer prevention and cancer treatment. It is a wondrous food supplement for patients undergoing cancer treatment to help combat cancer as well as counter cancer related health challenges. PHYCOCYANIN™ is filling a huge void in the cancer supportive care expectations that the patients and the physician can rely upon.**

#### **RECOMMENDED DOSAGE**

Two tablets a day per person or as directed by your physician.



ISO 9001:2008

The product comes in a tamper proof pack of 60 tablets of 200 mg each.



Hash BioTech Labs

---

Head Office: Hoshiarpur Road, Randhawa  
Teh: Dasuya, Dist: Hoshiarpur, Punjab - 144205, INDIA  
Telephone: +91 01883 291 777 Fax: +91 01883 291 778  
[www.HashBioTech.com](http://www.HashBioTech.com) [info@HashBioTech.com](mailto:info@HashBioTech.com)

---

[www.HASHBIOTECH.com](http://www.HASHBIOTECH.com)