

HASH BIOTECH LIMITED

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PHYCOERYTHRIN

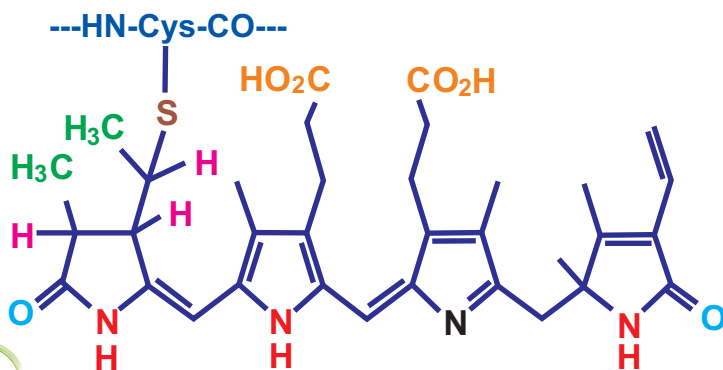
CHARACTERISTICS

MOLECULAR WEIGHT	: 240KDa
COMPOSITION	: PHYCOERYTHRIN CONSIST OF THREE ALPHA (α), BETA (β) AND GAMMA (γ) SUBUNITS. THE ALPHA, BETA AND GAMMA UNITS HAVE MOLECULAR WEIGHTS OF 20, 20 AND 30 KDA RESPECTIVELY.
PURITY	: $A_{566}/A_{280} > 4.6$, $A_{620}/A_{566} < 0.03$, $A_{566}/A_{498} < 1.5$
ABSORPTION MAXIMA	: 545nm, 563 nm
EMISSION MAXIMA	: 578 nm
CONCENTRATION	: ≥ 10.0 mg/mL (UV)
ORIGIN	: INDIA
SOURCE	: <i>Spirulina platensis</i>

PHYCOERYTHRIN (PE) OCCURS AS THE CYANOBACTERIAL PHYCOBILIPROTEIN WITH HIGH FLUORESCENCE QUANTUM YIELD, MOLAR EXTINCTION COEFFICIENTS, ABSORBTIVITY AND STABILITY. IT CAN BE EASILY CROSS LINKED WITH ANTIBODIES AND OTHER PROTEINS BY USING CONVENTIONAL MOLECULAR TAGGING TECHNIQUES WITHOUT LOSING ITS FLUORESCENT PROPERTIES.

THE PHYCOBILIPROTEINS ARE PROTEINS WITH LINEAR TETRAPYRROLE PROSTHETIC GROUPS (BILINS) THAT, IN THEIR FUNCTIONAL STATE, ARE COVALENTLY LINKED TO SPECIFIC CYSTEINE RESIDUES OF THE PROTEINS. THESE PROTEINS ARE FOUND IN CYANOBACTERIA (BLUE GREEN ALGAE), IN A CLASS OF BIFLAGELLATE UNICELLULAR EUKARYOTIC ALGAE (CRYPTOMONADS), AND IN RHODOPHYTA (RED ALGAE). THE INTRODUCTION OF PHYCOBILIPROTEINS AS FLUORESCENT TAGS OF CELLS AND MACROMOLECULES WAS FOLLOWED BY ITS WIDESPREAD APPLICATION IN HIGHLY SENSITIVE FLUORESCENCE TECHNIQUES SUCH AS FLUORESCENT ACTIVATED CELL SORTING, FLOW CYTOMETRY, FLUORESCENCE IMMUNOASSAY AND FLUORESCENCE MICROSCOPY[1].

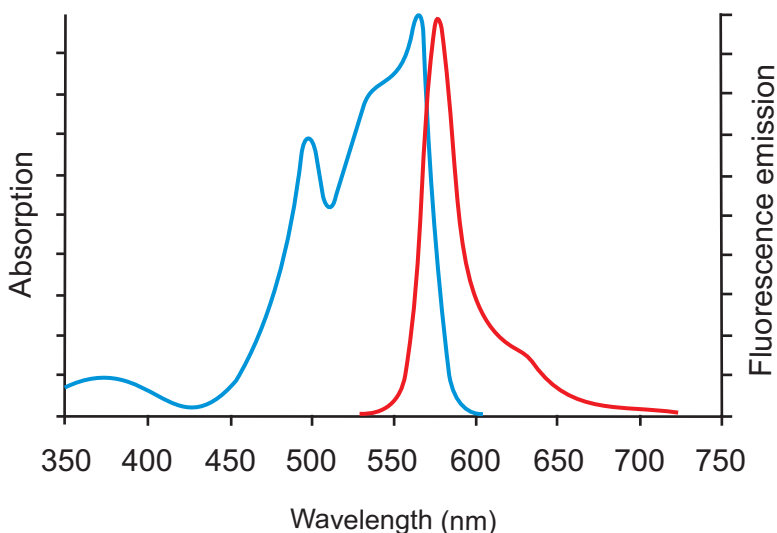
PHYCOERYTHRIN IS A MAJOR LIGHT-HARVESTING PIGMENT OF RED ALGAE AND CYANOBACTERIA THAT IS WIDELY USED AS A FLUORESCENT PROBE AND ANALYTICAL REAGENT. PHYCOERYTHRINS CAN BE DIVIDED INTO THREE MAIN CLASSES, DEPENDING ON THEIR ABSORPTION SPECTRUM, B-PHYCOERYTHRIN (PEAKS AT 545, 565 NM WITH A 499 SHOULDER), R-PHYCOERYTHRIN (PEAKS AT 499, 565 NM AND



Molecular Skeleton of Phycoerythrin

A 545 SHOULDER) AND C-PHYCOERYTHRIN (PEAK AT 565) [2] [3] [4].

PHYCOERYTHRIN HAS BEEN SHOWN TO BE PARTICULARLY USEFUL DUE TO ITS LARGE ABSORPTION COEFFICIENT AND GREAT FLUORESCENCE PROPERTIES JUST AS THE HIGH QUANTUM YIELD AND HIGH STOKES SHIFT. PHYCOERYTHRIN FLUORESCES IN A SPECTRAL REGION THAT IS DISTINCT FROM THE REGION OF EMISSION OF THE SIMPLE ORGANIC DYES COMMONLY USED AS FLUORESCENT INDICATORS. THEREFORE, B-PHYCOERYTHRIN IS A VALUABLE CANDIDATE IN THE DESIGN AND CHARACTERIZATION OF LIGHT-SENSING ELEMENTS IN BIOSENSORS [5].



Absorption and fluorescence emission spectra of Phycoerythrin in pH 7.5 buffer

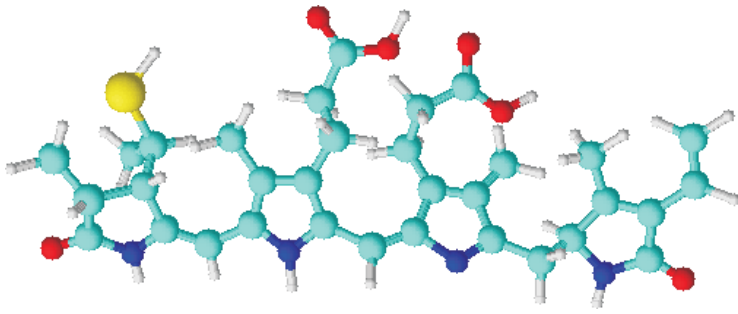
APPLICATION:

B-PHYCOERYTHRIN IS A VALUABLE COLORANT DUE TO ITS INTENSE AND UNIQUE PINK COLOUR. ITS UTILIZATION AS NATURAL DYES IN CHEWING GUMS, JAMS JELLIES ICE-CREAMS ETC HAS RAISED ITS HIGH DEMAND IN MARKET.

PHYCOERYTHRIN POSSESSES A YELLOW FLUORESCENCE. BY THE VIRTUE OF THIS PROPERTY IT HAS BEEN USED IN WIDE RANGE OF FOOD PRODUCTS THAT FLUORESCCE UNDER NATURAL LIGHT AND UV LIGHT LIKE TRANSPARENT LOLLIPOPS MADE FROM SUGAR SOLUTION (THAT FLUORESCCE UNDER UV LIGHT).

B-PHYCOERYTHRIN FLUORESCES IN A SPECTRAL REGION THAT IS DISTINCT FROM THE REGION OF EMISSION OF THE SIMPLE ORGANIC DYES COMMONLY USED AS FLUORESCENT INDICATORS. THEREFORE, B-PHYCOERYTHRIN IS AN ESSENTIAL COMPONENT OF A HUGE INDUSTRY BUILT ON SENSITIVE FLUORESCENCE DETECTION AND IT HAS PERMITTED SENSITIVE TWO-COLOR LYMPHOCYTE SUBSET ANALYSIS WITH A SINGLE ARGON ION LASER.

B-PHYCOERYTHRIN IS A VALUABLE CANDIDATE IN THE DESIGN AND CHARACTERIZATION OF LIGHT-SENSING ELEMENTS IN BIOSENSORS.



FLUORESCENT LABELING REAGENTS ARE AN ESSENTIAL COMPONENT OF MANY INDUSTRIES BUILT ON SENSITIVE FLUORESCENCE DETECTION. THIS POWERFUL MULTICHROMOPHORE PROTEIN-LABELING REAGENT HAS CHANGED THE FLOW CYTOMETRY INDUSTRY AND PERMITTED SENSITIVE TWO-COLOR LYMPHOCYTE SUBSET ANALYSIS WITH A SINGLE ARGON ION LASER. PHYCOERYTHRIN EXCITES VERY STRONGLY AT 488 NM BUT THE EMISSION IS SHIFTED TO 580 NM BY ENERGY TRANSFER EVENTS BETWEEN CHROMOPHORES WITHIN THE PROTEIN.

PHYCOERYTHRIN AS A SECOND COLOR WORKS WELL WITH FLUORESCENCE LABELED ANTIBODIES. THEY CAN ALSO BE EXCITED AT 488 NM BUT ARE DETECTED SEPARATELY AT 525 NM TO PROVIDE THE SECOND COLOUR OF DETECTION. HIV MONITORING AND CANCER DIAGNOSTICS WERE A STRONG DRIVING FORCE FOR THE GROWTH OF THIS REAGENT.

THREE- AND FOUR-COLOR ANALYSES WITH A SINGLE LASER ARE NOW COMMONLY PLACE WITH PHYCOBILIPROTEIN-BASED ENERGY TRANSFER REAGENTS. LOW MOLECULAR WEIGHT FLUORESCENT LABELS SUCH AS CYANINE DYES CY5 (INDODICARBOCYANINE) AND CY7 (INDOTRICARBOCYANINE) ARE GOOD ACCEPTORS FROM EXCITED PHYCOERYTHRIN AND SHIFT EMISSION FARTHER TO RED AND DEEP RED WAVELENGTHS AND 11-COLOR ANALYSES ARE NOW POSSIBLE [6].

PHYCOERYTHRIN IS ALSO A VERY IMPORTANT REAGENT IN PROTEOMICS AND GENOMICS AND FORM THE BASIS OF DETECTION SYSTEM IN AFFYMETRIX CHIPS (DNA MICROARRAYS). PHYCOERYTHRIN LABELED STREPTAVIDIN IS ADDED AFTER COMPLETE BINDING AND PRODUCES A STRONG SIGNAL FROM ARRAY ELEMENTS CONTAINING THE BIOTIN-LABELED DNA OR PROTEIN PROBES [7].

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