Lutein

Lutein from Latin luteus meaning “yellow” is a xanthophyll and one of 600 known naturally occurring carotenoids. Lutein is synthesized only by plants and like other xanthophylls is found in high quantities in green leafy vegetables such as spinach, kale and yellow carrots. In green plants, xanthophylls act to modulate light energy and serve as non-photochemical quenching agents to deal with triplet chlorophyll (an excited form of chlorophyll), which is overproduced at very high light levels, during photosynthesis.

In humans, the Observed Safe Level (OSL) for lutein, based on a non-government organization evaluation, is 20 mg/day.

Although much higher levels have been tested without adverse effects and may also be safe, the data for intakes above the OSL are not sufficient for a confident conclusion of long-term safety.

Neither the U.S. Food and Drug Administration nor the European Food Safety Authority consider lutein an essential nutrient or have acted to set a tolerable upper intake level [1)].

Many studies have reported that lutein may exert its biological activities, including antiinflammation, anti-oxidase and anti-apoptosis, through effects on reactive oxygen species (ROS). Thus, lutein may prevent the damaging activities of ROS in cells.

Tan et al. investigated the effect of lutein against severe traumatic brain injury (STBI) and examined the mechanism of this protective effect. Sprague-Dawley rats were randomly divided into 5 groups: Control group, STBI model group, 40 mg/kg lutein-treated group, 80 mg/kg lutein-treated group and 160 mg/kg lutein-treated group. In this study, lutein protects against STBI, suppressed, interleukin (IL)-1β, IL-6 and monocyte chemoattractant protein-1 expression, reduced serum ROS levels, and reduced superoxide dismutase and glutathione peroxidase activities in STBI rats. Treatment with lutein effectively downregulated the expression of Nuclear factor kappa (NF-κB) p65 and cyclooxygenase 2, intercellular adhesion molecule (ICAM)-1 protein, and upregulated NFE2L2 and endothelin-1 protein levels in STBI rats. These findings demonstrated that lutein protects against STBI, has anti-inflammation and antioxidative effects and alters ICAM-1/Nrf-2 expression, which may be a novel therapeutic for STBI the clinic [2)].

1)
https://en.wikipedia.org/wiki/Lutein

2)
Tan D, Yu X, Chen M, Chen J, Xu J. Lutein protects against severe traumatic brain injury through anti-inflammation and antioxidative effects via ICAM-1/Nrf-2. Mol Med Rep. 2017 Jul 20. doi: 10.3892/mmr.2017.7040. [Epub ahead of print] PubMed PMID: 28731190.