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Functional Medicine

## QUOTE GM #48

2019-05-06

Title

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### DIETARY POLYPHENOLS PROTECT AGAINST OXIDATIVE STRESS!

Oxid Med Cell Longev. 2019 Mar 24;2019:9682318. doi: 10.1155/2019/9682318. eCollection 2019.

#### **Dietary Polyphenols in Age-Related Macular Degeneration: Protection against Oxidative Stress and Beyond.**

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#### **Abstract**

Age-related macular degeneration (AMD) is a multifactorial disease of the retina featured by degeneration and loss of photoreceptors and retinal pigment epithelium (RPE) cells with oxidative stress playing a role in its pathology. Although systematic reviews do not support the protective role of diet rich in antioxidants against AMD, dietary polyphenols (DPs) have been reported to have beneficial effects on vision. Some of them, such as quercetin and cyanidin-3-glucoside, can directly scavenge reactive oxygen species (ROS) due to the presence of two hydroxyl groups in their B ring structure. Apart from direct ROS scavenging, DPs can lower oxidative stress in several other pathways. Many DPs induce NRF2 (nuclear factor, erythroid 2-like 2) activation and expression of phase II enzymes that are under transcriptional control of this factor. DPs can inhibit A2E photooxidation in RPE cells, which is a source of oxidative stress. Anti-inflammatory action of DPs in RPE cells is associated with regulation of various interleukins and signaling pathways, including IL-6/JAK2 (Janus kinase 2)/STAT3. Some DPs can improve impaired cellular waste clearance, including AMD-specific deficient phagocytosis of the A $\beta$ 42 peptide and autophagy.

PMID: 31019656 PMCID: PMC6451822 DOI: 10.1155/2019/9682318