Resveratrol

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- Resveratrol is a type of natural non-flavonoid polyphenol, and a phytoalexin which is produced by several plants in response to injury or when the plant is under attack by pathogens such as bacteria or fungi.
- Sources of resveratrol in food include the skin of grapes, blueberries, raspberries and mulberries.
- In vitro studies indicate that resveratrol activates 1) sirtuin 1 (SIRT1); which is an enzyme that deacetylates proteins that contribute to cellular regulation, and 2) PGC-1alpha, and affects functioning of mitochondria.
- Resveratrol gets extensively metabolized in the body, with the liver and lungs as the major sites of its metabolism.
- Interest in the compound became the center of attention in 2003 when research from David Sinclair (and his team from Harvard) reported that resveratrol was able to increase the lifespan of yeast cells.
- In June 2012, research from the University of Alberta commented that resveratrol may enhance exercise training and performance, showing that high doses of the natural compound improved physical performance, heart function and muscle strength in lab models.

Resveratrol in Dentistry

- Periodontitis is a chronic infection of the gum affecting the soft tissue and bone supporting the teeth. Reportedly it is the second most common disease worldwide.
- Resveratrol was found to suppress the growth of certain bacteria known to promote periodontal disease, with no living bacteria found after 24 hours of study. " It was demonstrated that resveratrol, a naturally occurring phytoalexin, possesses a significant antimicrobial effect against the periodontal pathogens Actinobacillus actinomycetemcomitans and Porphyromonas gingivalis"
- Research out of Japan shows that mice with experimentally induced periodontitis that were treated with resveratrol derivative-rich melinjo seed extract "actually caused healing of bone." The research showed that resveratrol reversed bone loss when administered after establishment of periodontitis.
- "The data show that these agents not only inhibit induction of periodontitis/bone-loss (in rats) but also reverse the loss of bone in situations where bone loss has already developed."
- Reactive oxygen species (ROS) is required for osteoclast differentiation and therefore the higher the levels of ROS, especially in Periodontally compromised individuals, leads to increased levels of bone loss.

- The mechanism in which this happens is thought to be by eliminating reactive oxygen species preventing osteoclastogenesis and reducing inflammation and therefore preventing and also reversing bone loss in rats.
- Studies have shown that smokers have higher levels of oxidative stress and that the aryl hydrocarbons from smoke attract ROS species - which causes osteoclast differentiation. It is the aryl hydrocarbons upregulation of ROS species in which Resveratrol may inhibit, therefore decreasing or eliminating the osteoclastic differentiation = minimizing bone loss.

Summary:

Resveratrol, a natural phenol found in different foods from grapes to blueberries and raspberries, it is thought to initially improve cardiovascular health. While Resveratrol's use in dentistry still needs to undergo multiple studies involving human trials the initial results (from rat studies) are impressive. Resveratrol shows clear benefits when studied in rats with experimentally induced periodontitis. The results include not only preventing inflammation and bone loss but more importantly, reversing previous bone loss that had occurred.

References

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