



Human Skin Carotenoids Measured by BioPhotonic Scanner and Effects of Life Styles and LifePak on Carotenoids Scores

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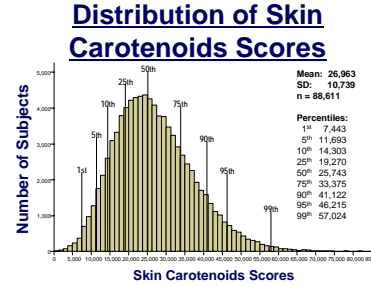
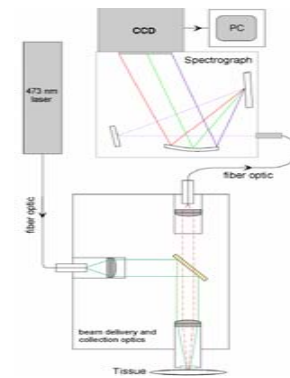


Abstract

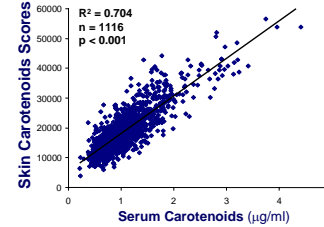
Biophotonic Scanner was designed by use of a technique of Resonance Raman Spectroscopy, a non-invasive, easy-to-use tool to specifically determine skin antioxidant carotenoids. We examined skin carotenoids of 88,611 volunteers, and monitored changes in human skin carotenoids as a function of life styles and in response to daily consumption of fruits, vegetables, and a dietary supplement LifePak. We found that skin carotenoids presented as Biophotonic Scanner scores are significantly closely, positively correlated with serum carotenoids determined by use of HPLC (n=1116, r²=0.704, p<0.001). Non-smokers and subjects with less sun-light exposure had significantly higher scores than those for cigarette smokers and former smokers and people with high exposure to sun light (p<0.001). The higher the BMI, the lower the scores (p<0.001), indicating diluted fat-soluble carotenoids in the skin associated with increased body fat mass. The more daily consumption of fruits-vegetables and dietary supplements, the higher the scores (p<0.01). Daily LifePak intake resulted in increases in the scores by 24.3% after 4 weeks of supplementation and by 44.0% after 8 weeks (p<0.001). In conclusion, Biophotonic scanner scores reflect steady state levels of antioxidant carotenoids in human's skin. Fruits-vegetables intake and LifePak supplements increase the antioxidant capacity, but smoking and sun-light exposure reduce it.

Resonant Raman Spectroscopy BioPhotonic Scanner

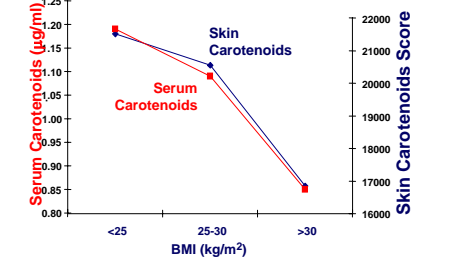
- Excitation: 473 nm
- Detection: 511 nm (C=C)



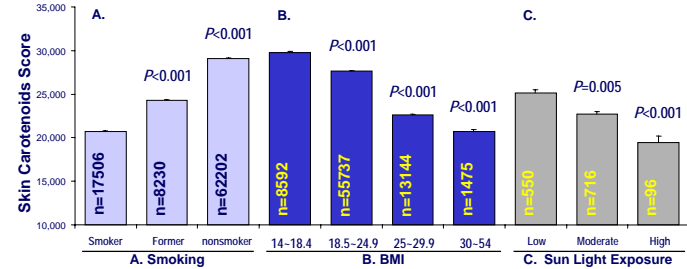
Correlation of Skin and Serum Carotenoids



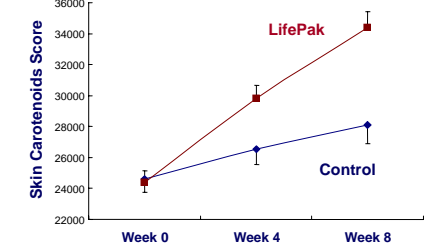
BMI vs. Serum & Skin Carotenoids



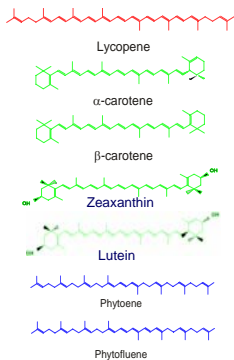
Effects of Smoking, BMI, & Sun-Light Exposure on Skin Carotenoids Score



LifePak Intake Increases Skin Carotenoids Score



Carotenoids

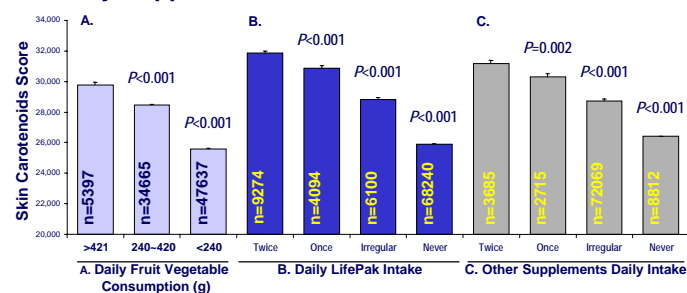


- Carotenoids are a group of fat soluble chemicals having antioxidant properties.
- Uptake through the diet
- Store in fat tissues and Stratum Corneum (SC) of human skin
- Safe vitamin A sources (α- & β-carotene)
- Benefits in immune functions (β-carotene), and protections of DNA (lycopene) and macular region of retina (lutein)

Skin Carotenoids Scanner Scores



Effects of Fruits-Vegetable Consumption, LifePak & Other Dietary Supplements Intake on Skin Carotenoids Score



Conclusion

- Skin carotenoids score reflects steady state levels of antioxidant carotenoids, and closely, positively correlates to serum carotenoids.
- The higher the BMI, the lower the skin carotenoids score, indicating distribution of fat-soluble carotenoids in human bodies.
- Smoking and sun-light exposure reduce skin carotenoids scores, indicating reduction of body's antioxidant defense capacity.
- Daily consumption of fruits and vegetables, and supplementation of dietary supplements, especially LifePak, increase skin carotenoids scores, indicating increases in body's antioxidant defense capacity.