

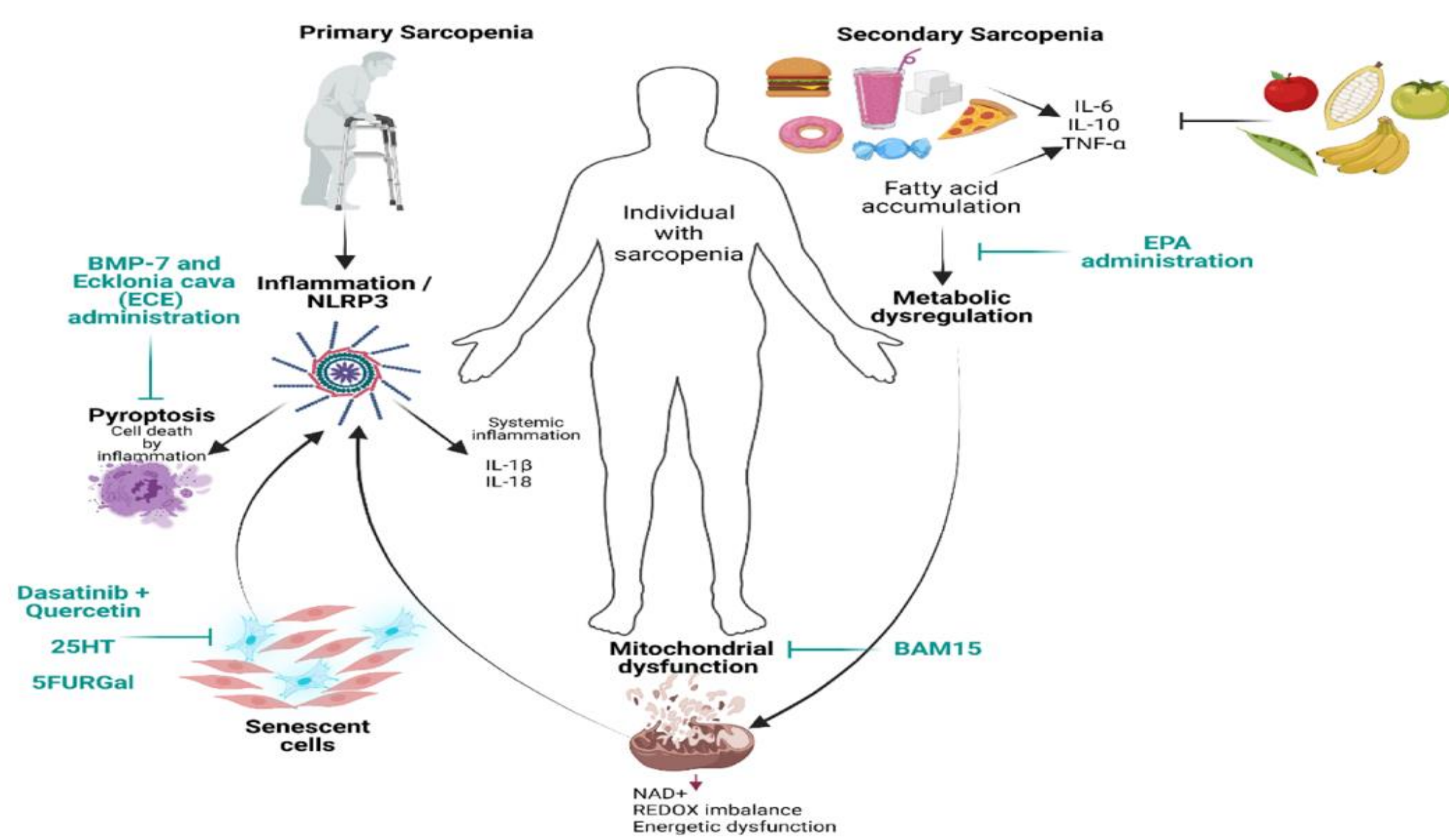
Attenuation of muscle loss and functionality through diet in patients with muscle atrophy-associated inflammation: a bibliographic review

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INTRODUCTION & AIM

Muscle atrophy can be generated by various factors: inflammation, malnutrition, aging, and a pro-inflammatory diet. The latter can lead to muscle wasting by promoting oxidative stress and thus activating the proinflammatory response via pro-inflammatory cytokines such as IL-6 and TNF α , which in turn can trigger insulin resistance, obesity, and type II diabetes, as well as alter muscle regeneration and cause aging. Oxidative stress and the impairment of antioxidant defenses promote an imbalance in homeostasis, leading to muscle atrophy and mitochondrial dysfunction. Bioactive substances can prevent the loss of muscle mass and promote functional recovery.



Molecular Mechanisms of Inflammation in Sarcopenia: Diagnosis and Therapeutic Update. *Cells*. 2022; 11(15):2359

To review the association between inflammation and muscle atrophy and how dietary compounds can attenuate muscle loss.

METHOD

A bibliographic search was conducted in the Medline, Web of Science, and Scopus databases including articles published in the last 10 years in English and Spanish.

RESULTS & DISCUSSION

Food phytochemicals can prevent muscle protein degradation, promote protein synthesis, support anti-inflammation, and downregulate atrophy gene expression.

Nutraceutical	Chemical structure	Dietary source	Mechanism
Oleuropein, hydroxytyrosol, and tyrosol		Extra virgin olive oil and its phenolic compounds	Act by eliminating ROS, activating anabolic pathways, and counteracting mitochondrial and inflammatory alterations
DHA		Nuts, fish	Prevents palmitate-induced atrophy by inhibiting mitochondrial ROS production
Resveratrol		Grapes, red wine	Increases mitochondrial biogenesis and decreases MuRF-1 and mitophagy.
Selenium		Nuts, eggs	Decrease in IL-6, TNF- α , and myostatin
Vitamins A, C, and D		Carrots, dairy, eggs	reduce oxidative stress and the expression of MuRF1 and MAFbx.
Epicatechin-3-gallate		Tea polyphenols	Decrease MuRF1, MAFbx and Myostatin
Gallocatechin gallate			Increases myogenesis (Myf5, MyoD)
Epicatechin			Increases myogenesis (Myf5, MyoD)
Curcumin		Sardine, curcuma, curry	Decreases NF- κ B, TNF- α , IL-1 β , MuRF1, and MAFbx, muscle proteolysis
Astaxanthin		Salmon, trout, crabs, shrimp.	Decreases oxidative stress, proteolysis, apoptosis, and ROS
Phenolic compounds from pomegranate		Pomegranate	Inhibit oxidative stress, NF- κ B, and the ubiquitin-proteasome system, on top of activating Akt/mTOR signaling.

CONCLUSION

Inflammation is associated with muscle atrophy, chronic diseases, and aging. Food phytochemicals may be key to reducing the individual's inflammatory condition.

FUTURE WORK / REFERENCES

- Research for nutritional treatment in sarcopenic elderly patients

