SUPPLEMENTAL MATERIAL

Table S1. Exclusion Criteria
1. Have significant disease(s) or condition(s) that put the subject at risk
2. Hospitalized within 3 months for major atherosclerotic events
3. Any metal implants in soft tissues
4. Implanted cardiac pacemaker or other non-MRI compatible implanted cardiac device
5. Have chronic, uncontrolled hypertension as judged by the Investigator
6. BMI of < 18 or > 32 kg/m^2
7. Creatinine clearance < 45 mL/min
8. Laboratory or ECG abnormalities
9. Clinically significant abnormalities on physical examination (as judged by the Investigator)
10. History or evidence of renal, hepatic, pulmonary (including chronic asthma), endocrine (eg, diabetes, hypo- and hyperthyroidism, adrenal insufficiency), central nervous or neurologic disorders (MS, epilepsy, history of seisures), or gastrointestinal (cirrhosis or viral hepatitis) system dysfunction,
11. Claustrophobia
12. Cancer, unless subject has documentation of completed curative treatment
13. History of serious mental illness as judged by the Investigator
14. Alcohol or drug abuse
15. Are currently or within the last 30 days enrolled in a clinical trial involving an investigational product or nonapproved use of a drug or device or concurrently enrolled in any other type of medical research judged not to be scientifically or medically compatible with this study
16. Donated or received blood or blood products within the past 30 days

The abbreviations are: BMI, body mass index.

Table S2. Treadmill time (min) and incline grade (%) during training at baseline (Pre), at the end (Post) and the change (ΔPost-Pre) with the study.

	Pre		Post		Post-Pre	
	Time (min)	Grade (%)	Time (min)	Grade (%)	Time (min)	Grade (%)
PL-INT	6.6±3.9	8.8±3.5	17.9±3.5	9.9±3.5	11.3±4.8	1.1±2.6
PL-REC	9.0±3.3	4.8±2.6	12.0±3.9	7.0±3.0	3.0±3.9	2.2±1.7
AX-INC	6.5±2.4	9.5±2.9	16.5±1.0	10.8±1.9	10.0±4.3	1.4±1.9
AX-REC	10.0±3.4	5.3±2.4	12.0±3.8	6.4±2.4	2.0±4.8	1.0±2.9

Values are means± SD Abbreviations are: PL – placebo, AX – Astaxanthin formulation, INT – interval, REC- recovery.

Table S3. Walking distance at baseline (Pre), at the end (Post) and the change (ΔPost-Pre) with the study in the placebo (PL) and astaxanthin formulation (AX) fed groups.

	Walking distance (Meter)			
	Pre	Post	Δ Post-Pre	*P*
PL	527±74	568±83	41±65	$P<0.001$
AX	530±53	581±53	48±38	$P<0.01$

Values are mean±SD (paired t-test)

Table S4: Human TA muscle properties pre and post training and treatment in the placebo (PL) and astaxanthin formulation (AX) fed groups.

	PL	AX
Strength (MVC, N)		
Pre	88.6±25.7	83.2±23.0
Post	87.4±18.7	91.4±19.2
ΔPost-Pre	-1.2±24.2	8.1±18.2
Muscle Size (CSA, mm^2)		
Pre	1030±214	1064±221
Post	1035±214	1092±23
ΔPost-Pre	5±43.6	28±48.0
Specific Force (MVC/CSA, N/mm^2)		
Pre	0.09±0.017	0.08±0.024
Post	0.09±0.022	0.09±0.024
ΔPost-Pre	-0.0002±0.044	0.007±0.019

Values are mean±SD. MVC: maximal volunteer contraction force; CSA, cross sectional area.

Figure S1A.

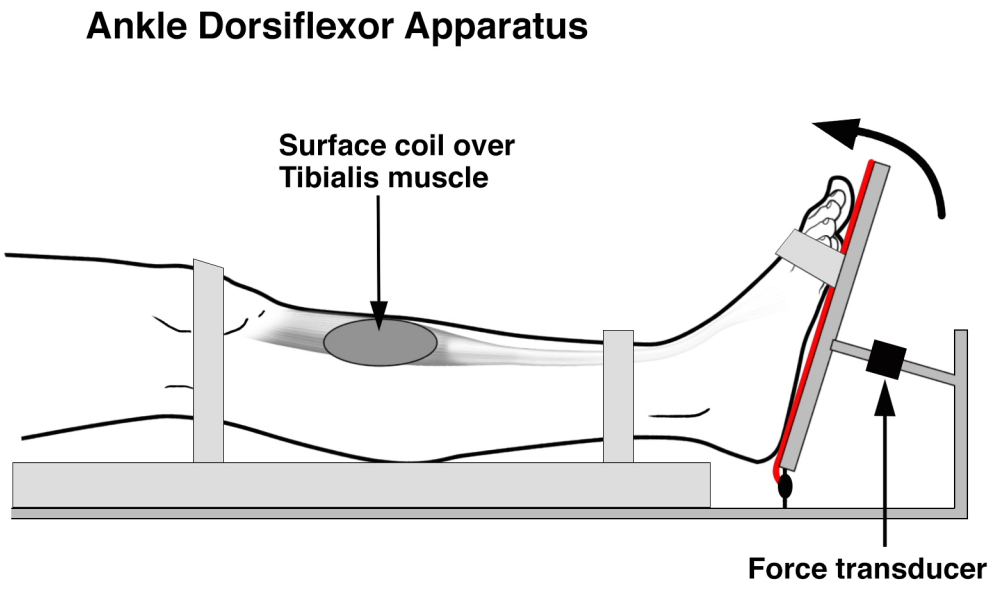

Figure S1B.

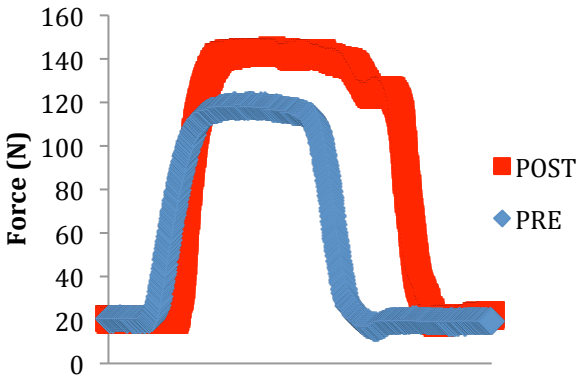

Figure S1. A) Apparatus for measuring muscle strength in ankle dorsiflexion, B) Example of a single maximum voluntary contraction at baseline and after three months of training in an Ax formulation treated human elderly subject.

Figure S2

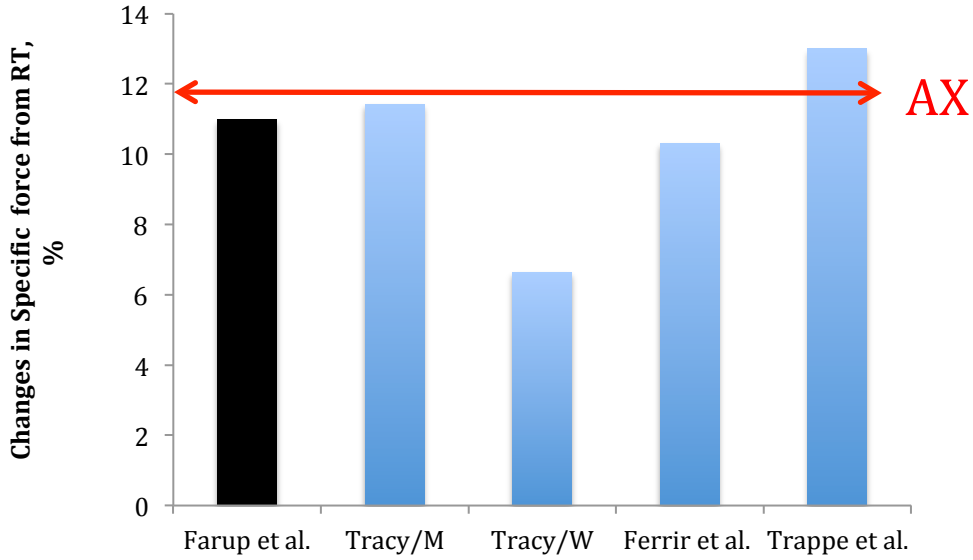

Figure S2. Specific force changes with resistance training (RT) and Ax treatment with exercise training (red arrow). Note: "Tracy/M" represents the older male average and "Tracy/W" represents the older female data. Farup et al. (black bar) training data from young adults; Tracy, Ferrir, and Trappe et al. data points all represents elderly (>65yr) subject training studies.

LITERATURE CITED

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2. Ferri A, Scaglioni G, Pousson M, Capodaglio P, Van Hoecke J, Narici MV. Strength and power changes of the human plantar flexors and knee extensors in response to resistance training in old age. *Acta Physiol Scand.* 2003;177(1):69-78.
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