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THESSALY

The SmArT Lab

Η μυϊκή λειτουργία κατά τη γήρανση: Ο ρόλος της φυσικής δραστηριότητας

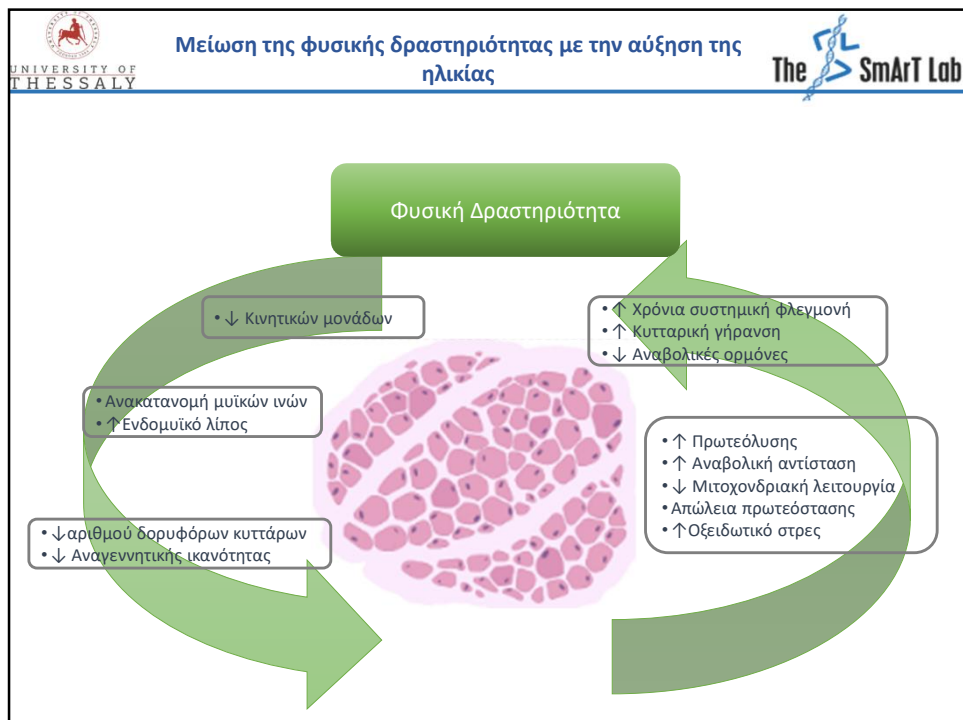
Μη σαρκωπενικός

Created in BioRender.com

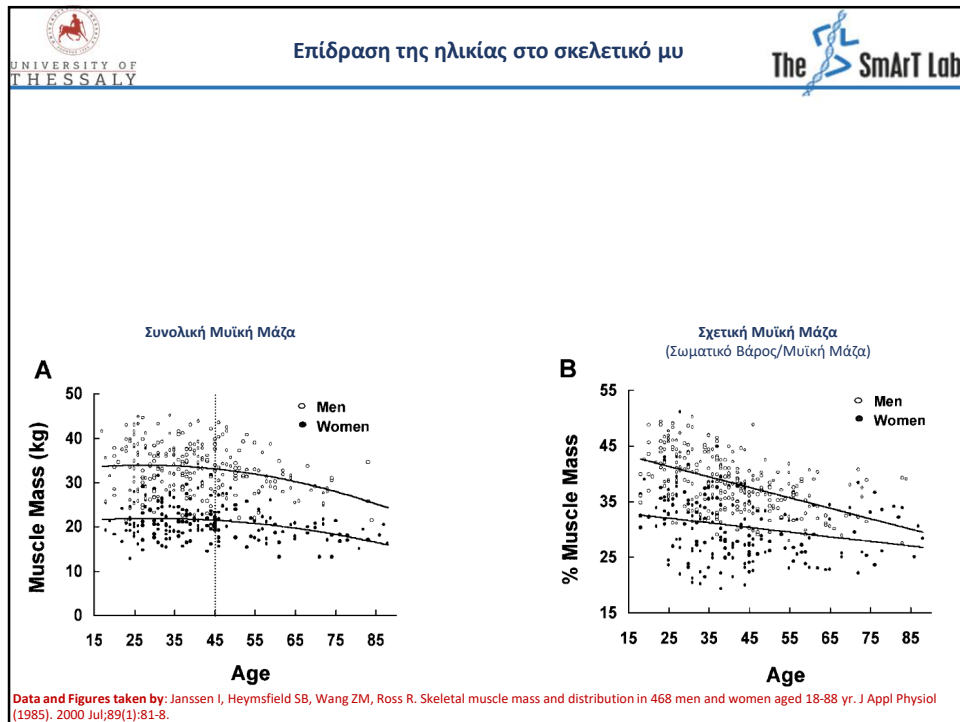
Σαρκωπενικός

Δραγανίδης Δημήτριος
Επίκουρος Καθηγητής
Τ.Ε.Φ.Α.Α. – Π.Θ.

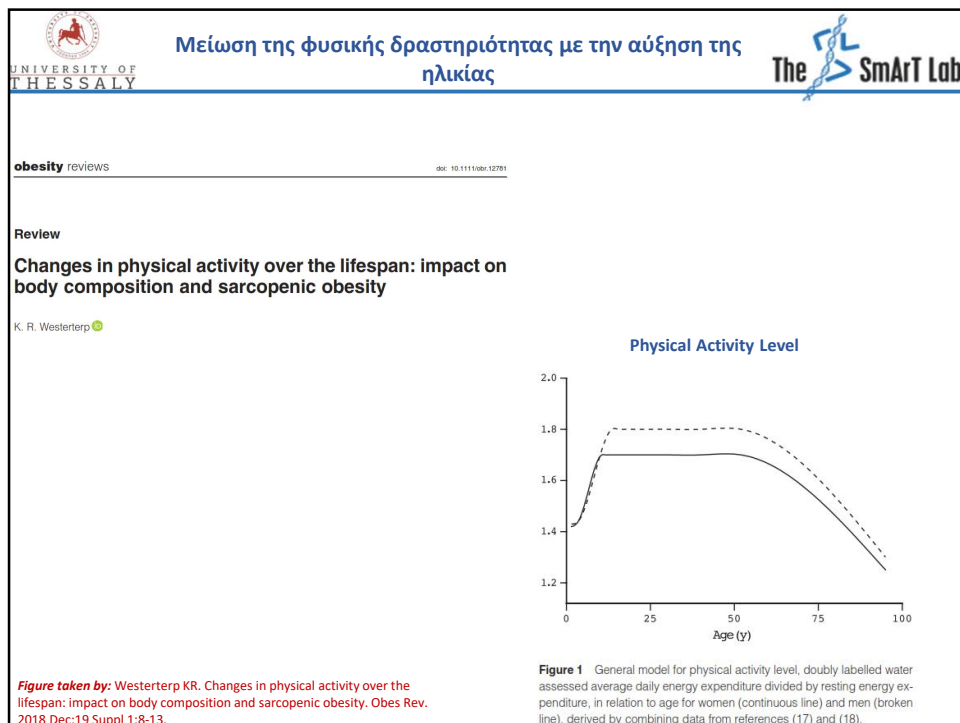
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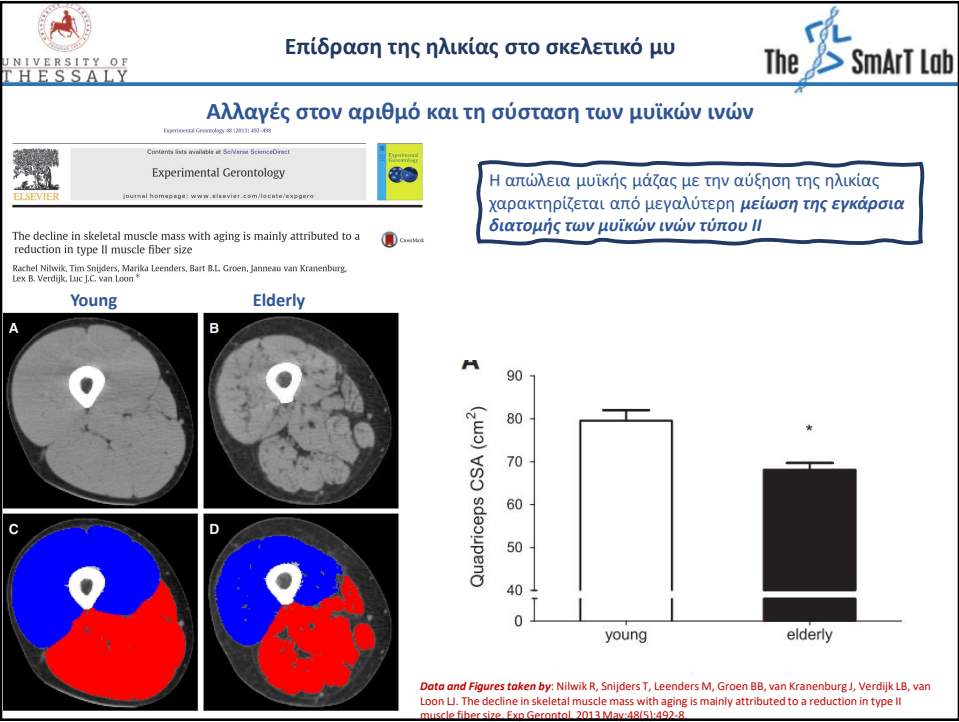
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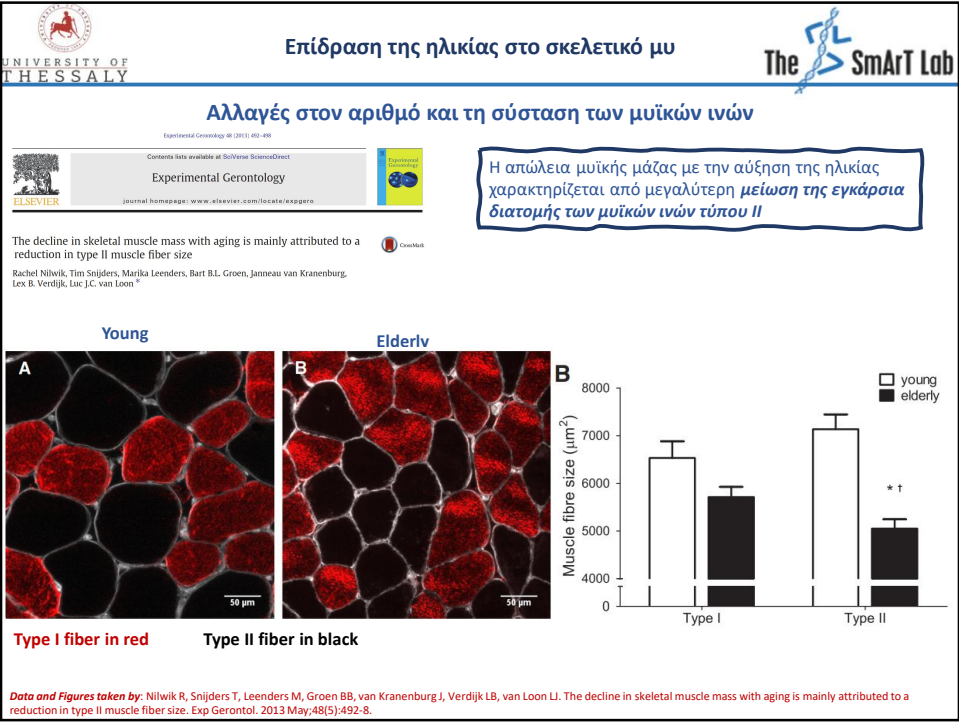
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Επίδραση της ηλικίας στο σκελετικό μυ

The SmArT Lab

○ Προοδευτική απώλεια μυϊκής μάζας -----> **Σαρκοπενία**

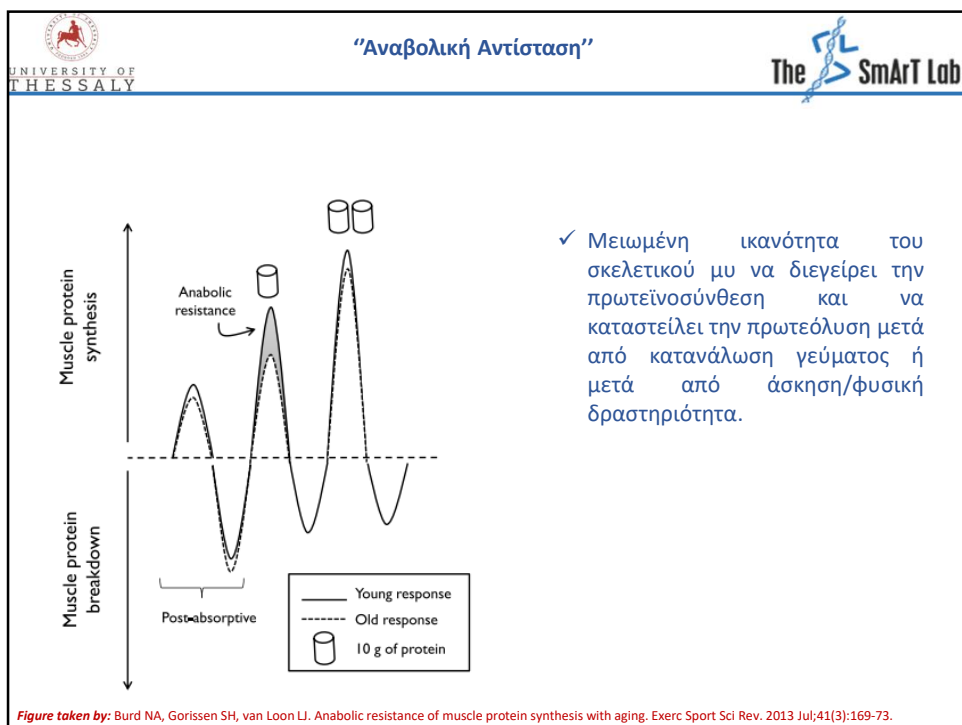
Απεικόνιση της εγκάρσιας διατομής του τετρακέφαλου μέσω μαγνητικής τομογραφίας (MRI)

part a

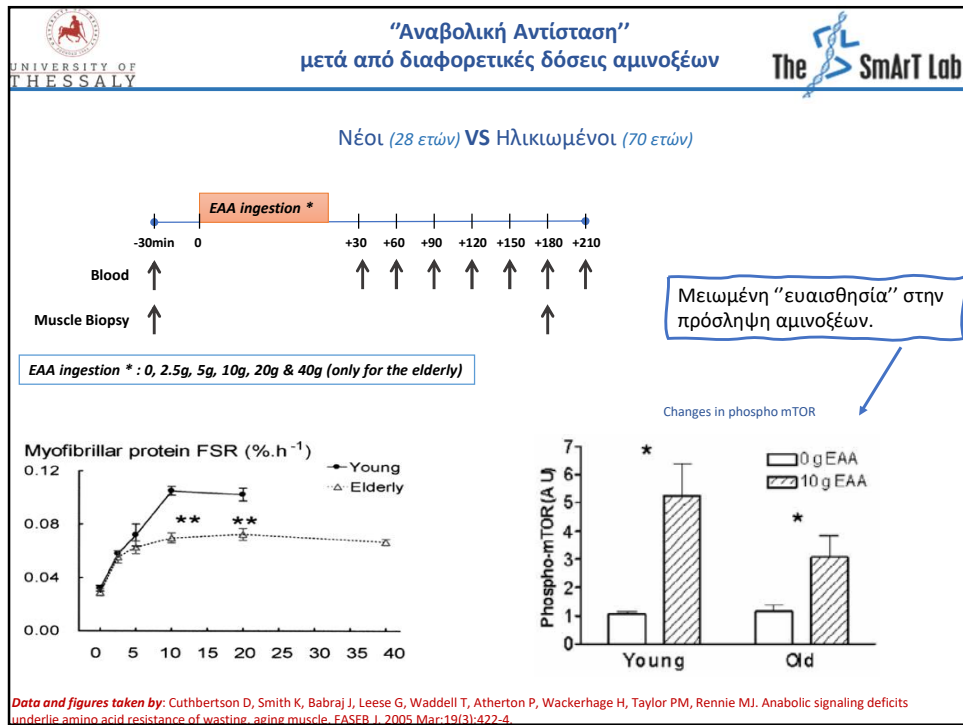
part b

Data and Photos taken by: Batsis JA, Villareal DT. Sarcopenic obesity in older adults: aetiology, epidemiology and treatment strategies. Nat Rev Endocrinol. 2018 Sep;14(9):513-537. doi: 10.1038/s41574-018-0062-9. PMID: 30065268; PMCID: PMC6241236.

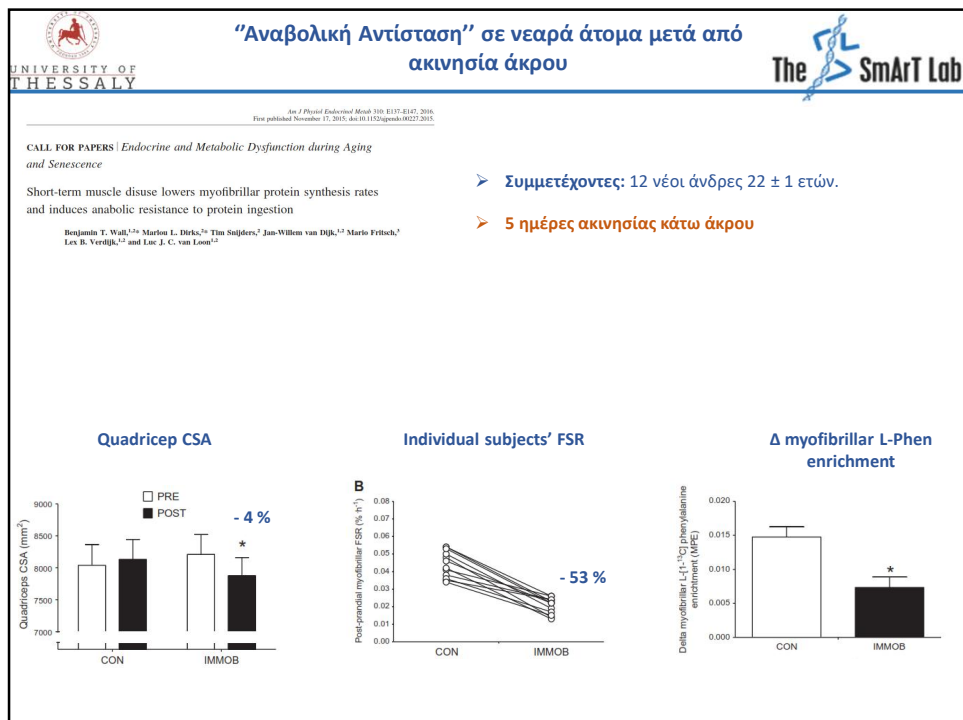
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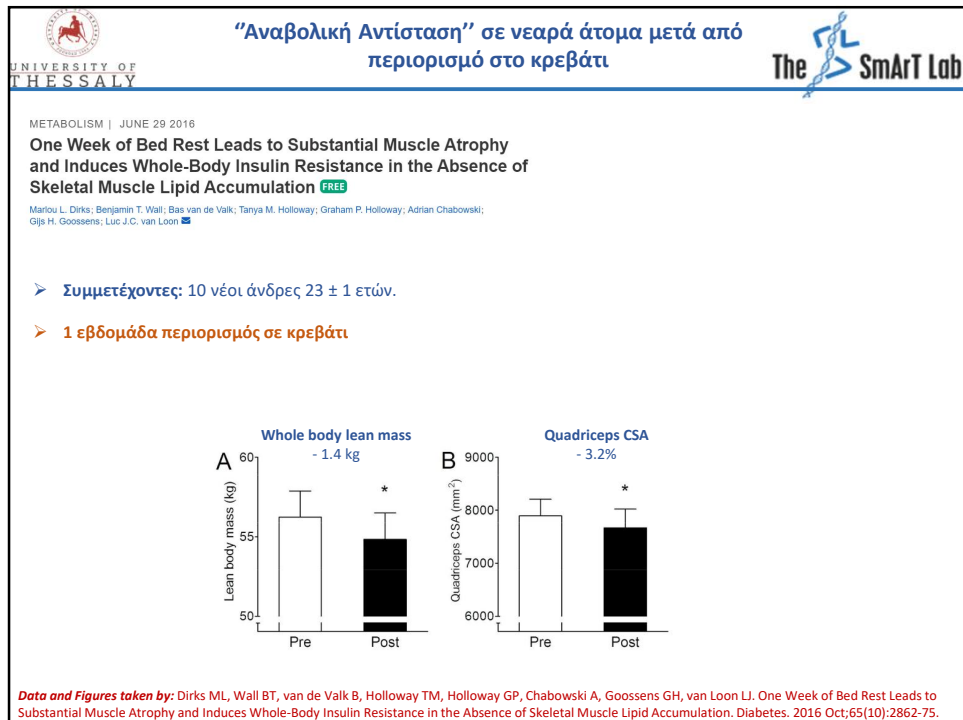
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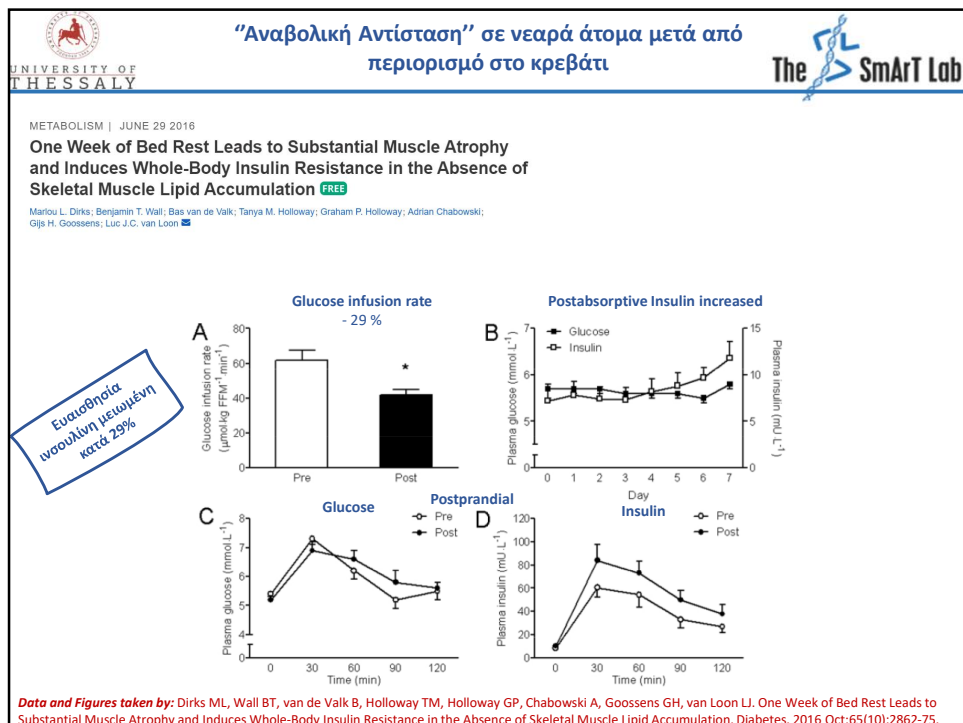
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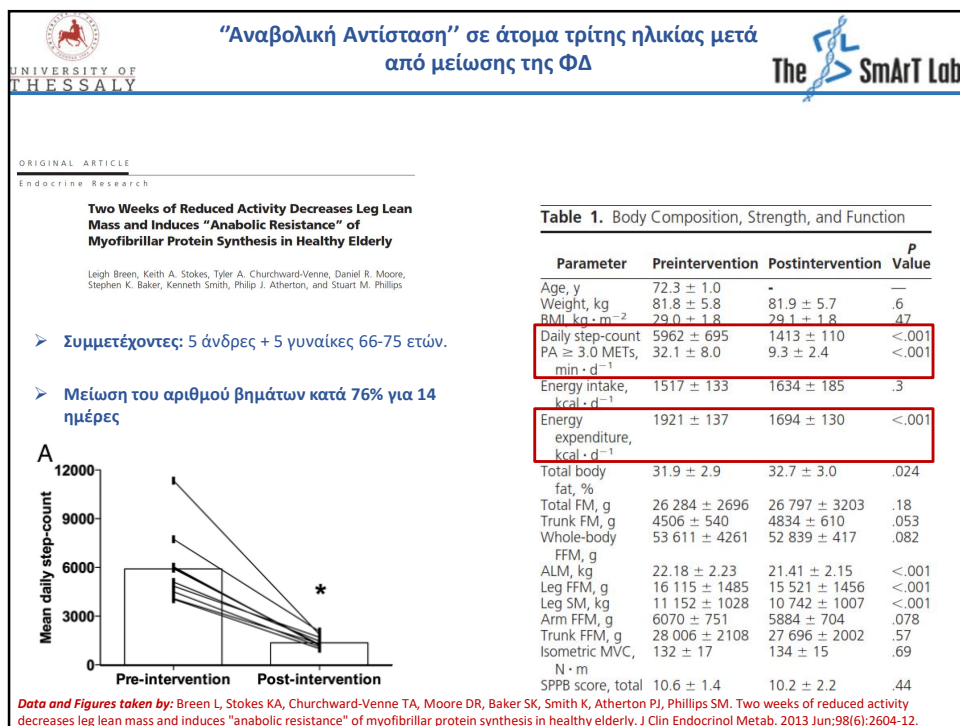
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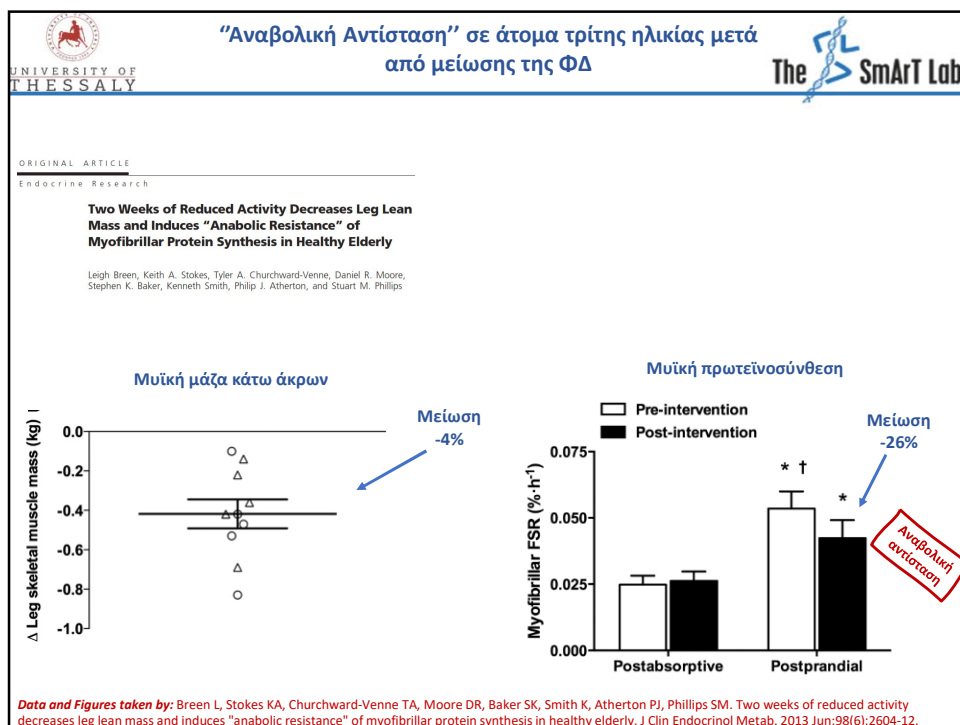
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“Αναβολική Αντίσταση” σε άτομα τρίτης ηλικίας μετά από μείωσης της ΦΔ

The SmArT Lab

ORIGINAL ARTICLE
Endocrine Research

Two Weeks of Reduced Activity Decreases Leg Lean Mass and Induces “Anabolic Resistance” of Myofibrillar Protein Synthesis in Healthy Elderly

Leigh Breen, Keith A. Stokes, Tyler A. Churchward-Venne, Daniel R. Moore, Stephen K. Baker, Kenneth Smith, Philip J. Atherton, and Stuart M. Phillips

- Ινσουλinoαντίσταση (νηστεία): +12%
- Ευαισθησία ινσουλίνης (μεταγευματικά): -43%
- TNF- α : + 12%
- CRP: + 25%

Table 2. Measures of Metabolic Health and Systemic Inflammation

Parameter	Preintervention	Postintervention	P value
Glucose AUC, mmol $\cdot$ mL $^{-1}$ $\cdot$ 120 min	454 $\pm$ 30	496 $\pm$ 28	<.01
Insulin AUC, μ U $\cdot$ mL $^{-1}$ $\cdot$ 120 min	2308 $\pm$ 114	2575 $\pm$ 123	<.01
HOMA-IR	2.72 $\pm$ 0.27	3.08 $\pm$ 0.32	<.01
Matsuda ISI	0.71 $\pm$ 0.15	0.55 $\pm$ 0.08	.014
Postabsorptive TNF- α , pg $\cdot$ mL $^{-1}$	4.18 $\pm$ 0.35	4.67 $\pm$ 0.32	.047
Postabsorptive IL-6, pg $\cdot$ mL $^{-1}$	6.38 $\pm$ 0.70	7.11 $\pm$ 0.51	.11
Postabsorptive CRP, μ g $\cdot$ mL $^{-1}$	0.96 $\pm$ 0.06	1.20 $\pm$ 0.13	.046
C-peptide AUC, pmol $\cdot$ L $^{-1}$ $\cdot$ 120 min	2135 $\pm$ 28	2117 $\pm$ 40	.7

Abbreviation: NS, not significant. Values are expressed as means $\pm$ standard error of the mean; n = 10.

Data and Figures taken by: Breen L, Stokes KA, Churchward-Venne TA, Moore DR, Baker SK, Smith K, Atherton PJ, Phillips SM. Two weeks of reduced activity decreases leg lean mass and induces “anabolic resistance” of myofibrillar protein synthesis in healthy elderly. *J Clin Endocrinol Metab.* 2013 Jun;98(6):2604-12.

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Αδυναμία επαναφοράς της αναβολικής ικανότητας σε άτομα τρίτης ηλικίας μετά από μείωση της ΦΔ

The SmArT Lab

GERONTOLOGICAL SOCIETY OF AMERICA

Research Article

Failed Recovery of Glycemic Control and Myofibrillar Protein Synthesis With 2 wk of Physical Inactivity in Overweight, Prediabetic Older Adults

Chloe McGlory, PhD^{1,2}, Mark T. van Allen, MSc^{1,2}, Tanner Stokes, BSc¹, Robert W. Morton, PhD¹, Amy J. Heaton, PhD¹, Bikem A. Lago, BSc¹, Annetje R. Rapheley, BSc¹, Emma K. Smith, PhD¹, Andrew G. MacArthur, PhD¹, Gregory R. Steinberg, PhD¹, Steven K. Baker, MD¹ and Stuart M. Phillips, PhD¹

➤ Συμμετέχοντες: 12 άνδρες + 10 γυναίκες 69 $\pm$ 4 ετών.

➤ Μείωση του αριθμού βημάτων: < 1000 βήματα/ημέρα για 14 ημέρες

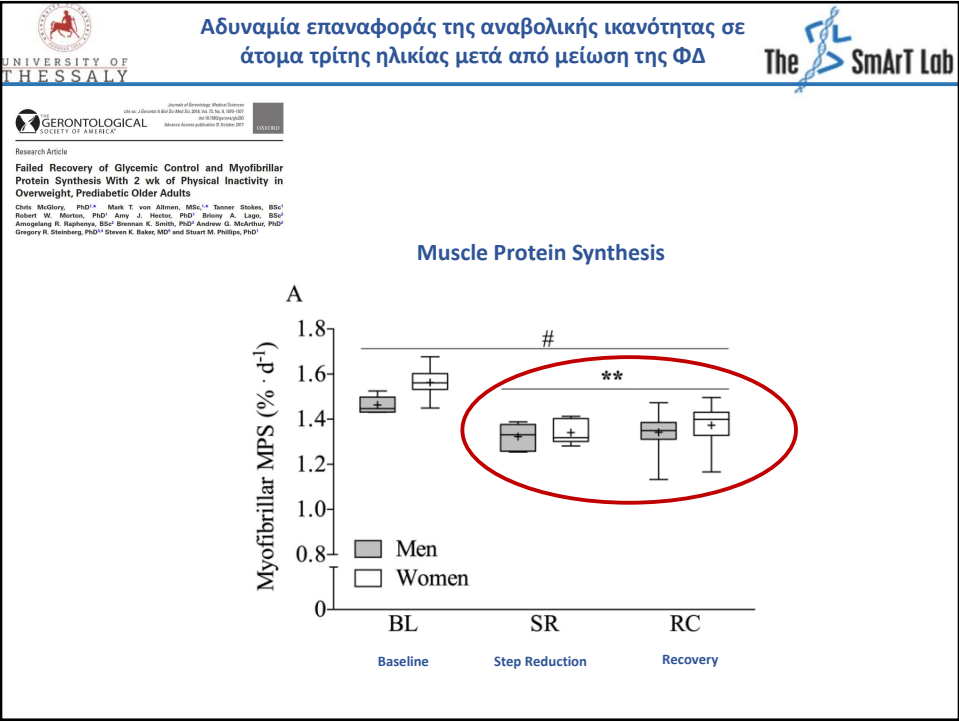
➤ Επαναφορά του αριθμού βημάτων: ~ 7000 βήματα/ημέρα για 14 ημέρες

Figure showing Muscle biopsy, ISH-MYC, DNA, OXIT, DKO (HsaL), and Fertilization over time (-5d, 0d, 4d, 7d, 14d, 21d, 28d, 35d). Legend: Baseline, Stop reduction, Recovery.

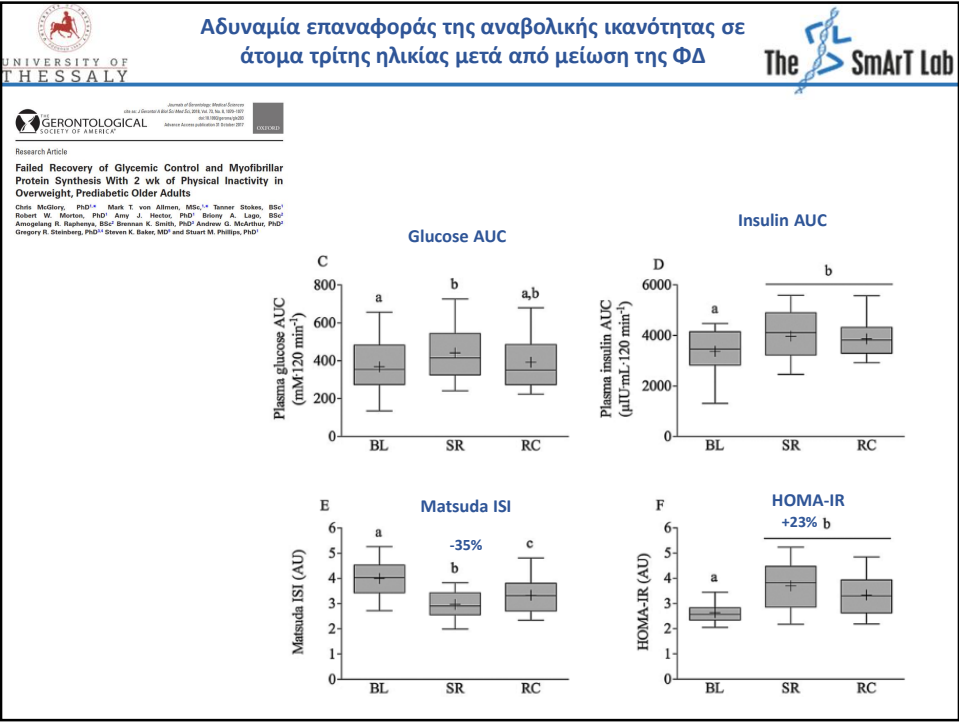
Table 1. Participant Characteristics and Daily Step Count

	Baseline		Step Reduction		Recovery	
	Men	Women	Men	Women	Men	Women
Age, y	69 $\pm$ 3	70 $\pm$ 5	—	—	—	—
Mass, kg	82.6 $\pm$ 16.1	70.3 $\pm$ 13.0	83.2 $\pm$ 16.7	70.3 $\pm$ 12.9	83.6 $\pm$ 16.9	70.3 $\pm$ 13.0
BMI, kg m $^{-2}$	27.2 $\pm$ 4.6	27.7 $\pm$ 5.1	27.6 $\pm$ 4.7	27.6 $\pm$ 5.1	27.7 $\pm$ 4.7	27.6 $\pm$ 5.2
Pedometer Steps d $^{-1}$	7,880 $\pm$ 3,800 ^a	6,585 $\pm$ 2,370 ^a	973 $\pm$ 83 ^b	1,018 $\pm$ 116 ^b	7,895 $\pm$ 4,323 ^a	5,948 $\pm$ 2,759 ^a
SenseWear Steps d $^{-1}$	7,027 $\pm$ 3,738 ^a	4,563 $\pm$ 1,478 ^a	1,295 $\pm$ 1,022 ^b	1,012 $\pm$ 430 ^b	6,152 $\pm$ 4,070 ^a	4,142 $\pm$ 1,899 ^a
PA $\geq$ 3 METS, min d $^{-1}$	101 $\pm$ 86 ^a	27 $\pm$ 16 ^a	16 $\pm$ 14 ^b	5 $\pm$ 4 ^b	95 $\pm$ 84 ^a	25 $\pm$ 18 ^a
DEE, kJ d $^{-1}$	10,982 $\pm$ 2,118 ^a	7,984 $\pm$ 917 ^a	8,827 $\pm$ 1,296 ^b	7,061 $\pm$ 656 ^b	10,683 $\pm$ 2,029 ^a	7,577 $\pm$ 758 ^a

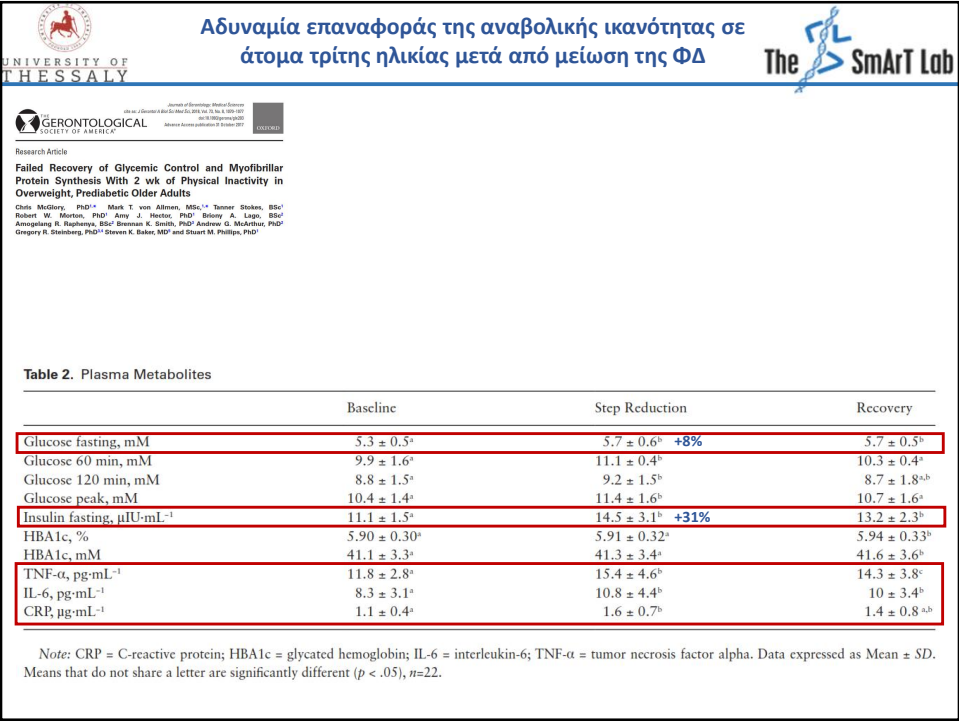
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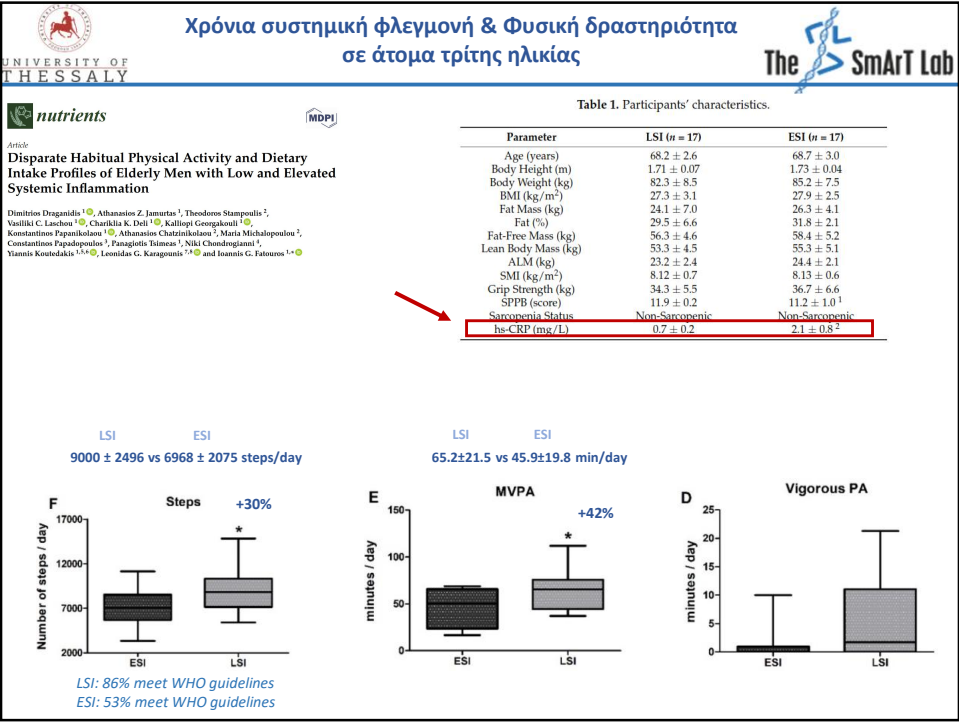
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Χρόνια συστηματική φλεγμονή & πρωτεόλυση σε άτομα τρίτης ηλικίας (?)

The SmArT Lab

J Nutr Sci Human Metabol 99: 117–124, 2013

Isolflavones Derived from Soy Beans Prevent MuRF1-Mediated Muscle Atrophy in C2C12 Myotubes through SIRT1 Activation

Katerina Hatzikakou¹, Ioanna Mouton¹, Chella Rajan¹, Marie Huetten¹, Shoshana Kuper¹, Tomoko Arai¹, Arisa Ochi¹, Rio Mitsu¹, Nikolaos Oikarinen¹, Shigehisa Tsunetsugu-Kawano¹, Ayako Otsu¹, Masashi Ohtsuka¹, Junji Terao¹ and Takashi Naitoh^{1,2*}

¹Department of Nutritional Physiology and ²Department of Food Science, Institute of Health Sciences, the University of Tokushima Graduate School, Tokushima 770-8503, Japan

*Medical Research Center, Tokushima University, Tokushima 760-8503, Japan

(Received February 20, 2013)

➤ C2C12 myotubes incubates with TNF α for 72h (0,1 – 1 – 10 – 100 ng/ml)

Cytosol

Nucleus

Proteasome

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Η επίδραση της ΦΔ στην ενεργοποίηση του NF-κB

The SmArT Lab

Effects of Age and Sedentary Lifestyle on Skeletal Muscle NF-κB Signaling in Men

Thomas W. Buford,¹ Matthew B. Cooke,² Todd M. Manini,³ Christian Levensonburgh,² and Thomas W. Whitworth^{1,2}

Old sedentary } 55-75 years
Old active }
Young sedentary } 18-30 years

Lower limb lean mass

Group	Lower limb lean mass (g/cm²)
YS	~25
OS	~22
OA	~23

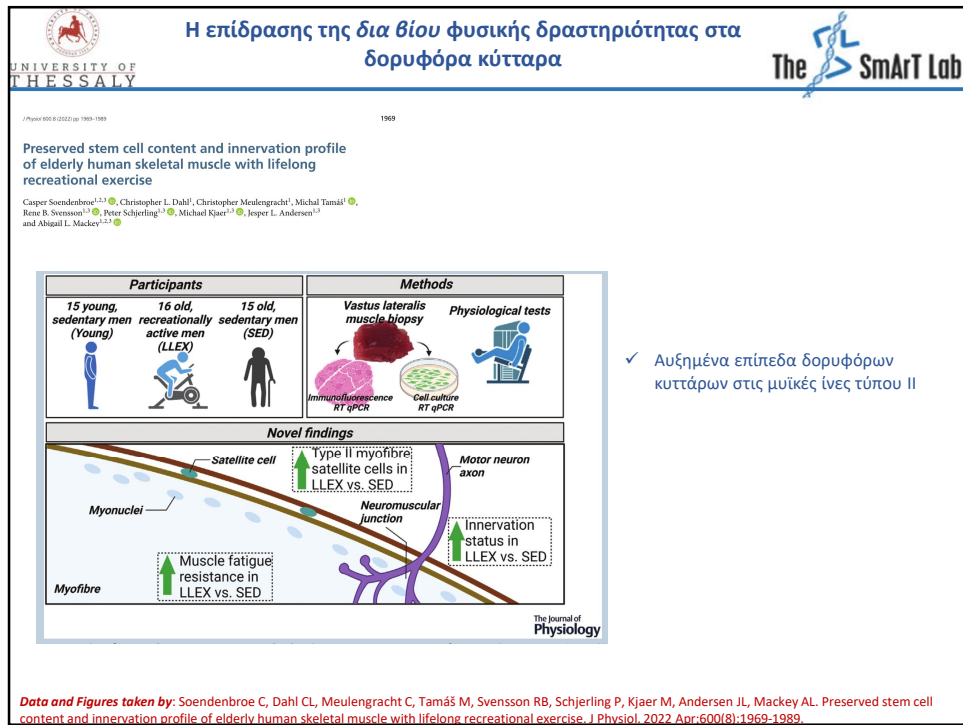
Skeletal muscle content of pIkBa

Group	Phosphorylated IκBα content (U/mg)
YS	~10
OS	~25
OA	~12

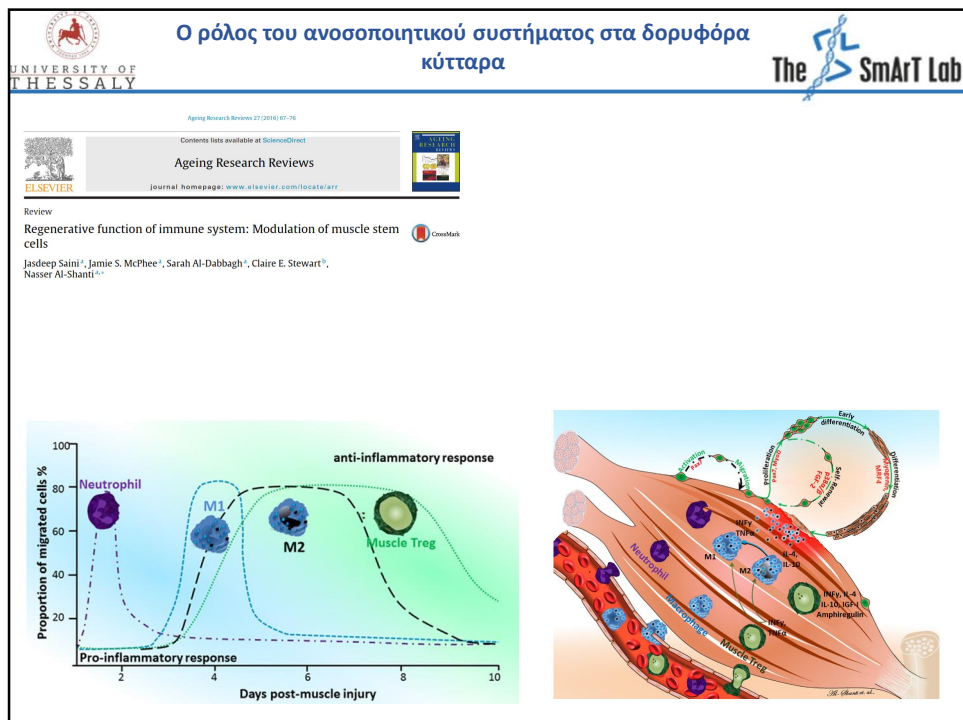
Nuclear p65

Group	p65 content (OD 490 nm)
YS	~0.25
OS	~0.30
OA	~0.28

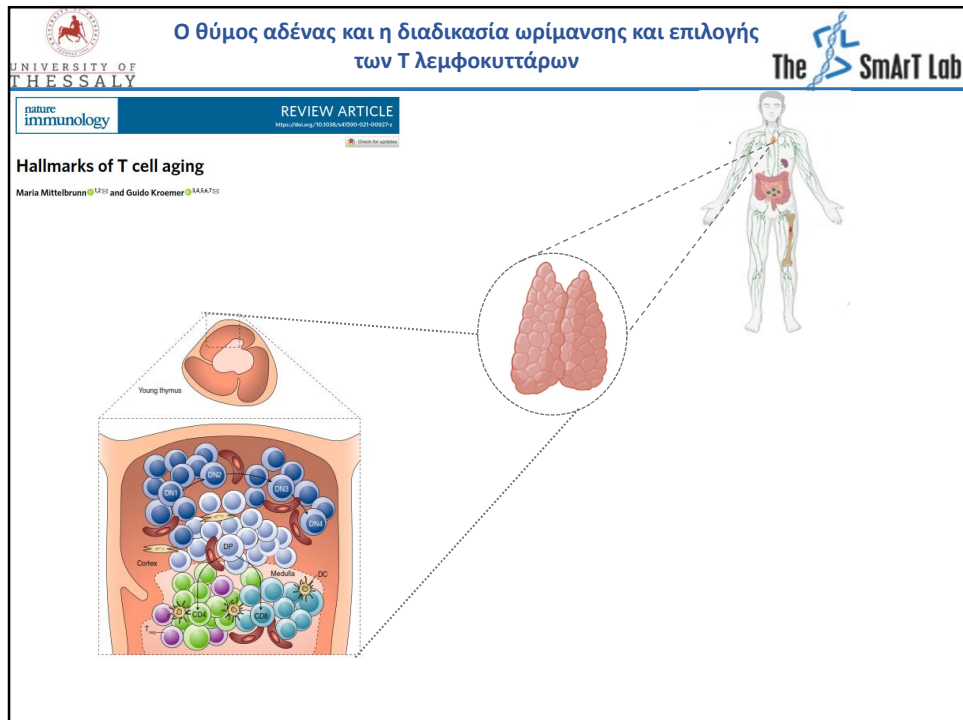
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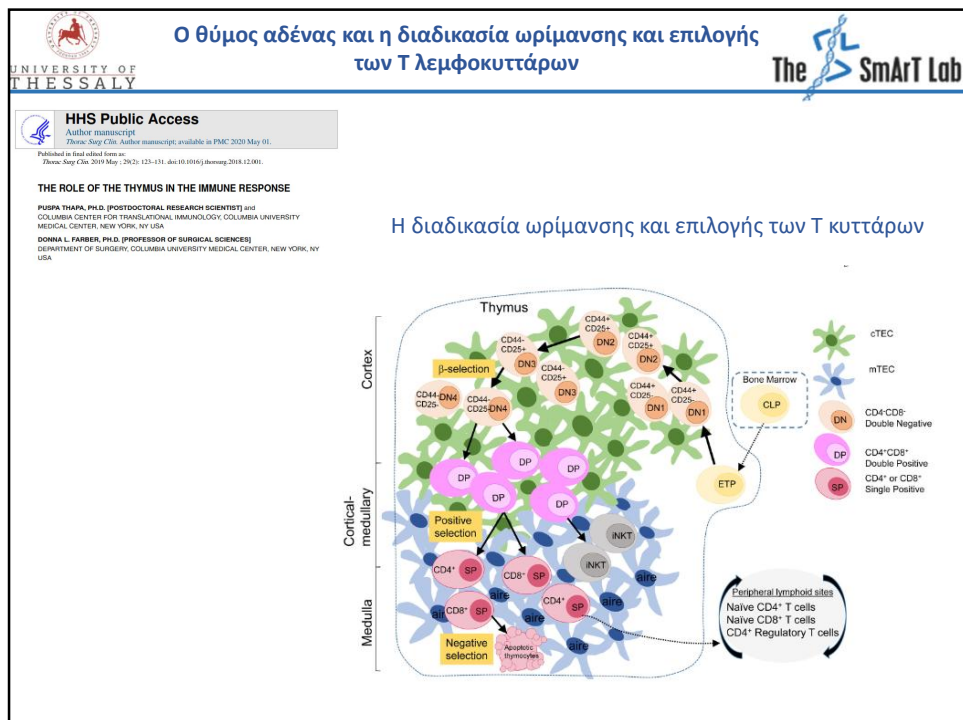
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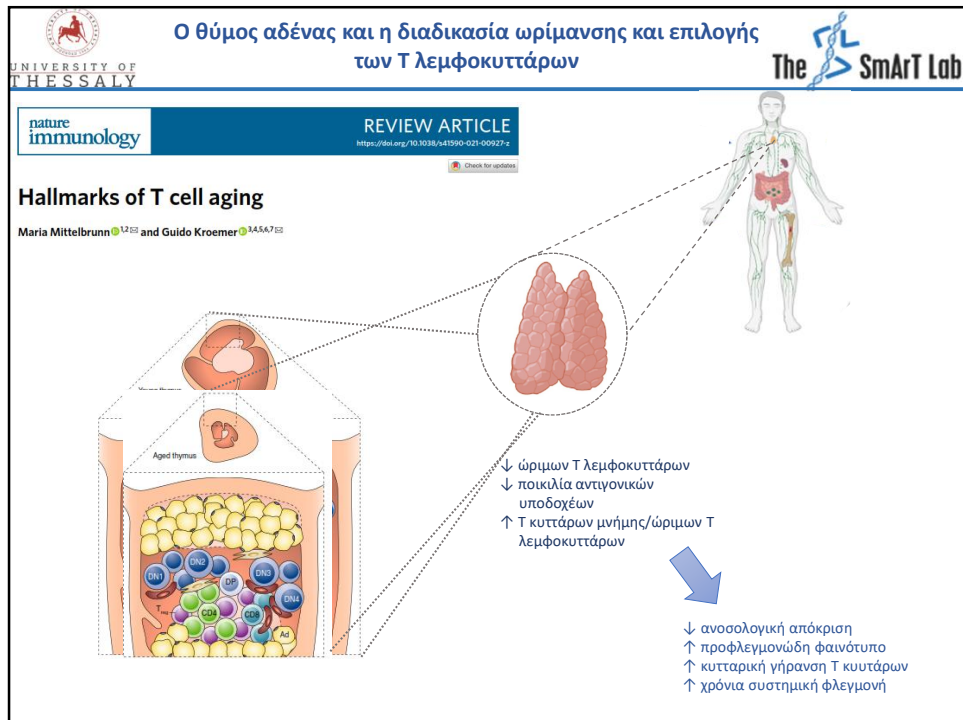
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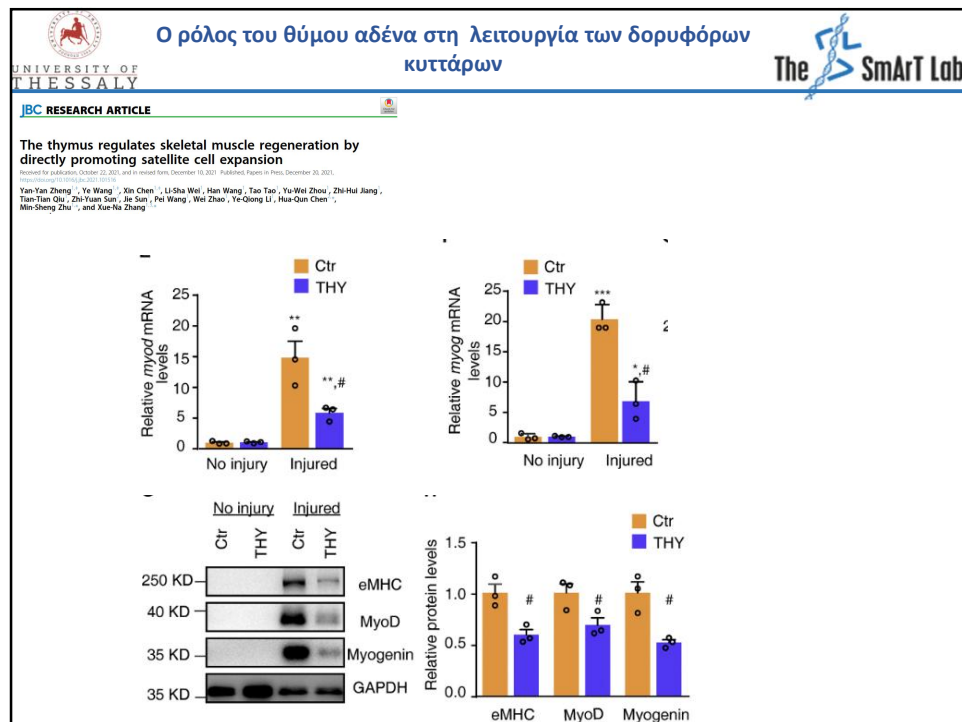


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Η επίδραση της φυσικής δραστηριότητας στο θύμο αδένος

Moderate physical activity associated with a higher naïve/memory T-cell ratio in healthy old individuals: potential role of IL15

David B. Battistini¹, Nivanka A. Dugan²

Συμμετέχοντες: 211 άτομα ηλικίας 60-79 ετών.

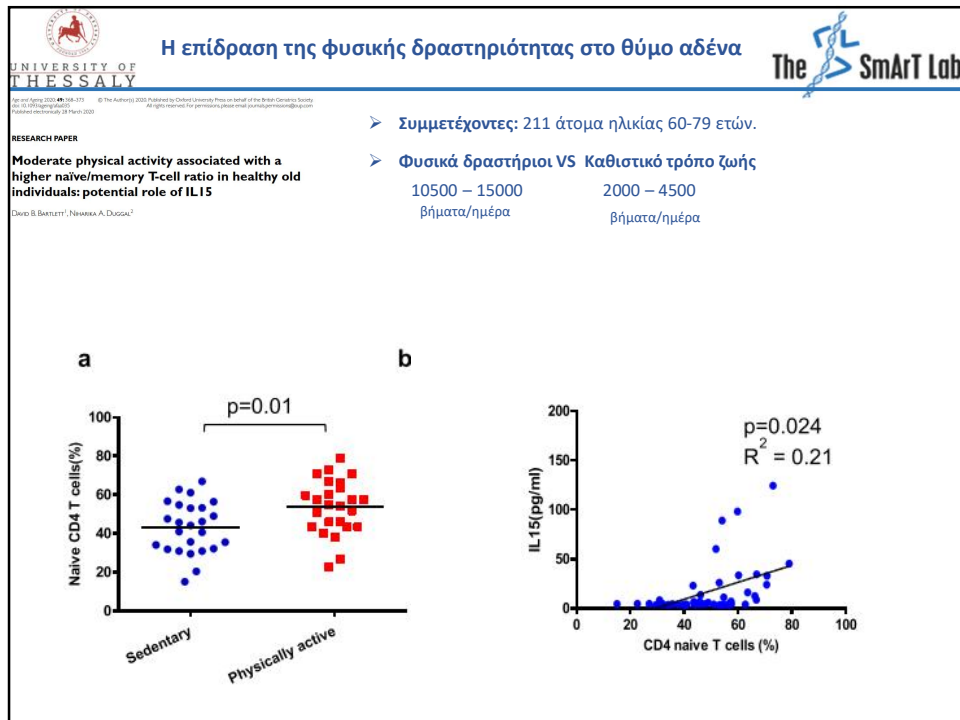
Φυσικά δραστήριοι VS Καθιστικό τρόπο ζωής

10500 – 15000 βήματα/ημέρα vs 2000 – 4500 βήματα/ημέρα

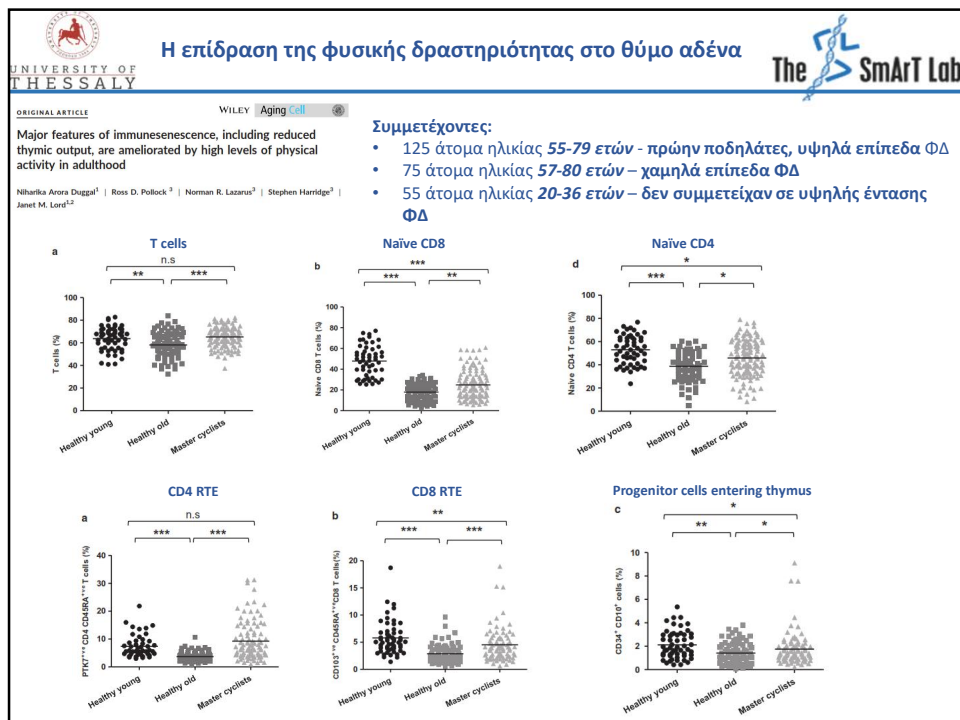
Table 1. Participant demographics, serum cytokine and hormone levels. Data represented as mean ± SD

	Sedentary old (n = 25)	Physically active (n = 25)	P value
Age	63.36 ± 4.42	67.04 ± 5.97	0.507
Male gender, n (%)	12 (48%)	11 (44%)	0.86
BMI	28.70 ± 4.56	25.14 ± 3.90	0.86
Waist/hip ratio	0.86 ± 4.56	.87 ± 1.0	0.114
Body fat (%)	39.99 ± 7.42	31.17 ± 6.11	0.003
Cholesterol (mmol/L)	5.44 ± 0.84	5.30 ± 1.03	0.49
Grip strength (kg)	29.02 ± 8.34	30.64 ± 10.11	0.69
Timed up and go (s)	9.01 ± 1.12	7.96 ± 1.71	0.009
CRP (mg/L)	1.38 ± 1.78	3.43 ± 5.82	0.09
IL-6 (pg/ml)	16.69 ± 21.84	34.90 ± 25.81	0.65
IL-17 (pg/ml)	16.69 ± 21.84	34.90 ± 25.81	0.27
TNFα (pg/ml)	2.33 ± 3.08	4.16 ± 9.60	0.32
IL-10 (pg/ml)	4.49 ± 5.44	13.13 ± 11.41	0.16
IL-7 (pg/ml)	20.28 ± 7.02	25.39 ± 11.40	0.02
IL-15 (pg/ml)	7.23 ± 9.81	34.92 ± 7.29	0.003
Cortisol (nmol/L)	319.5 ± 105.7	333.0 ± 85.42	0.39
DHEAS (nmol/L)	2580 ± 2015	2010 ± 1209	0.28
CMV ⁺ status (%)	13 (52%)	19 (76%)	0.08

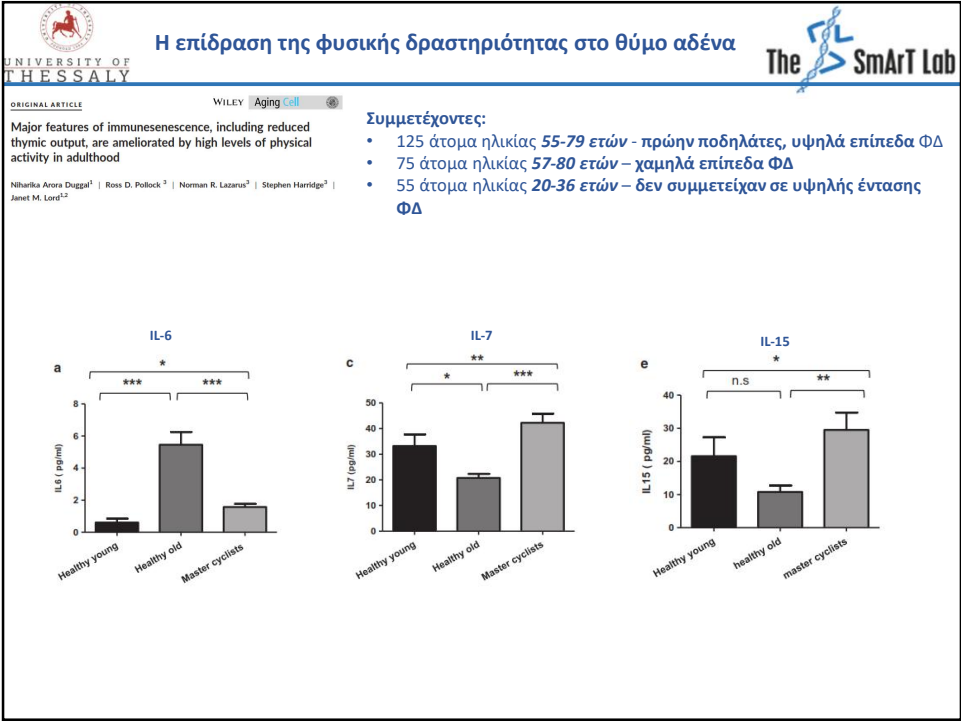
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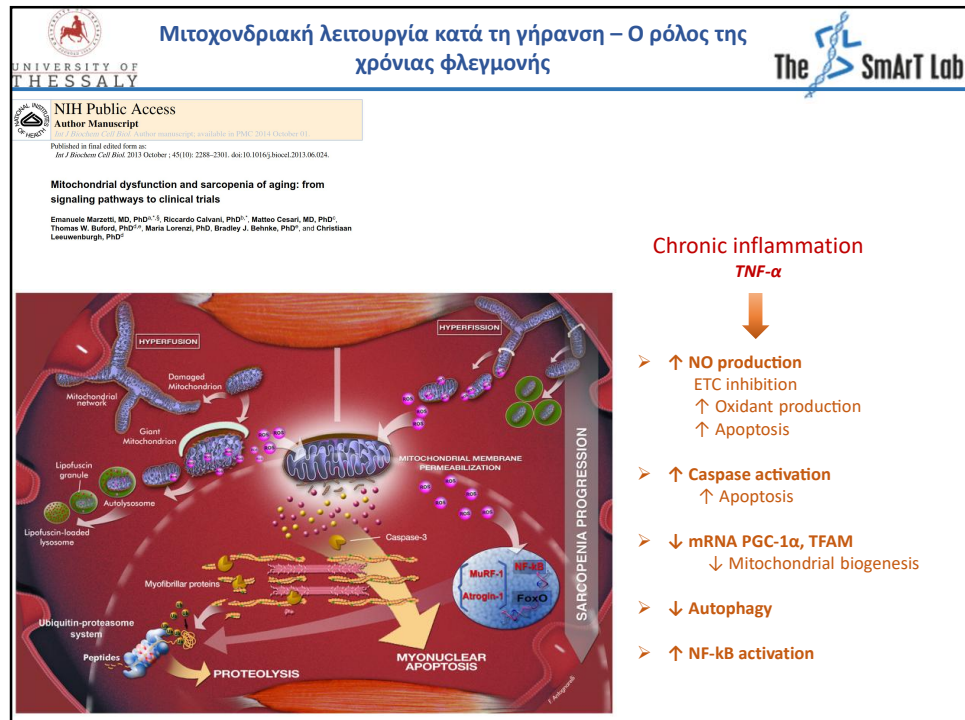
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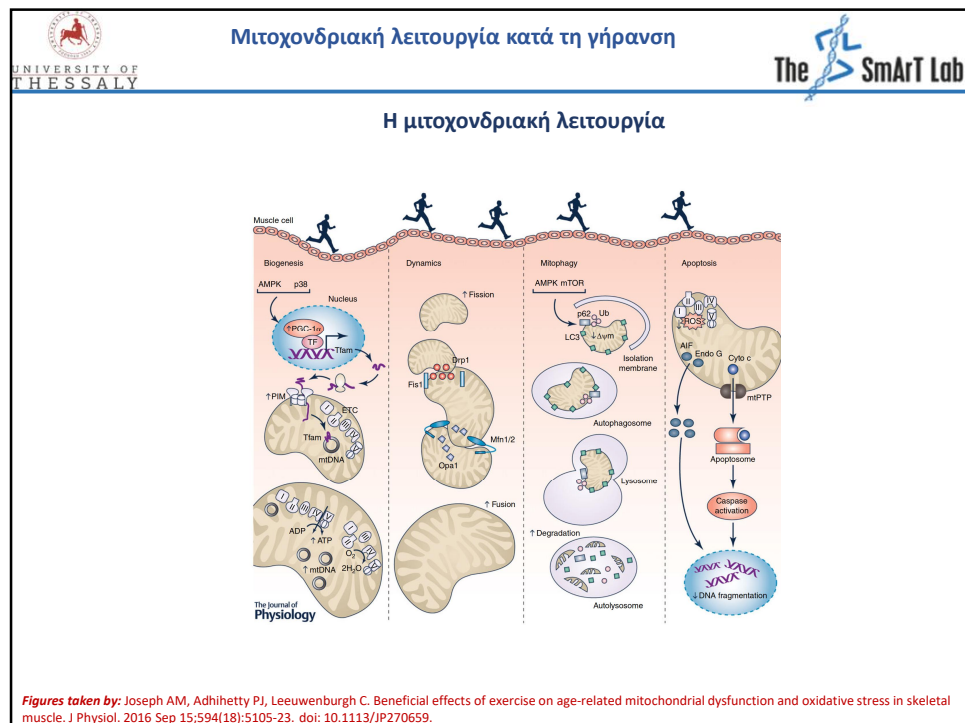
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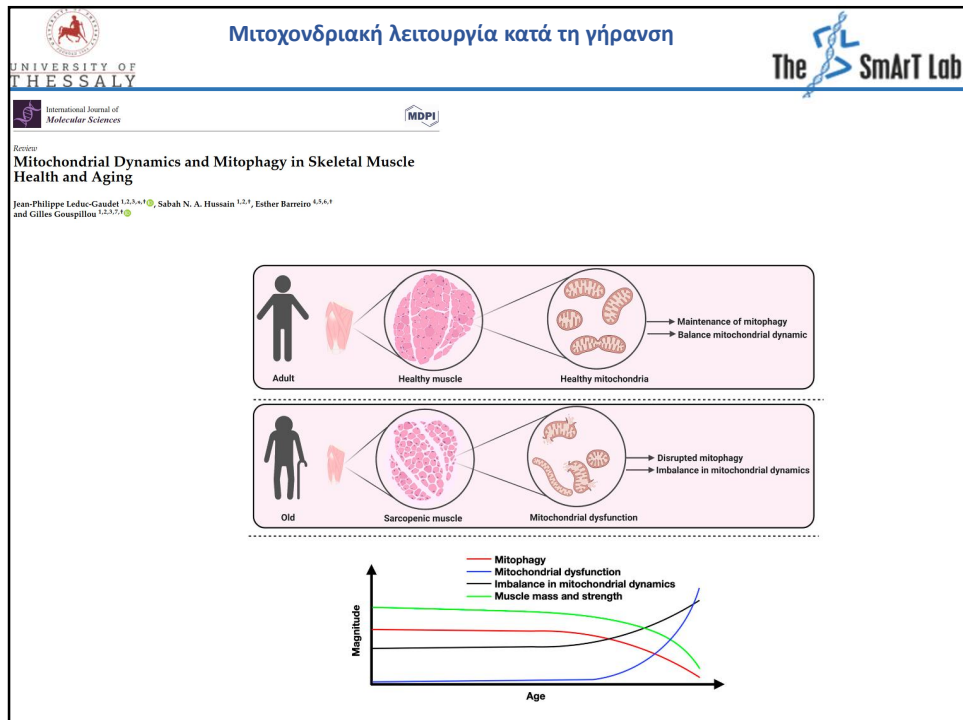
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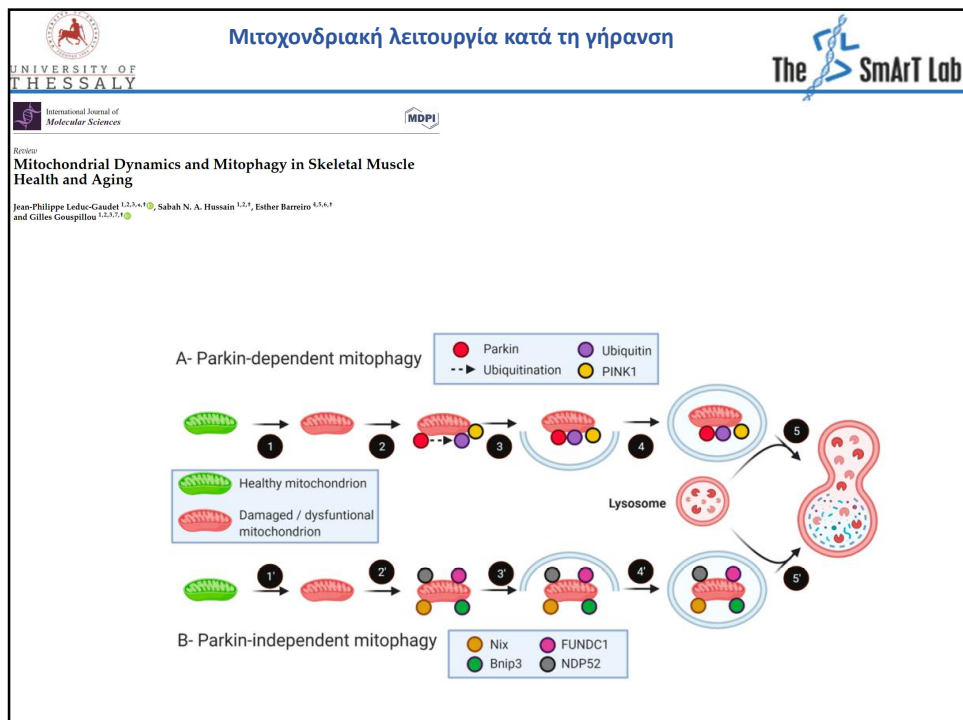
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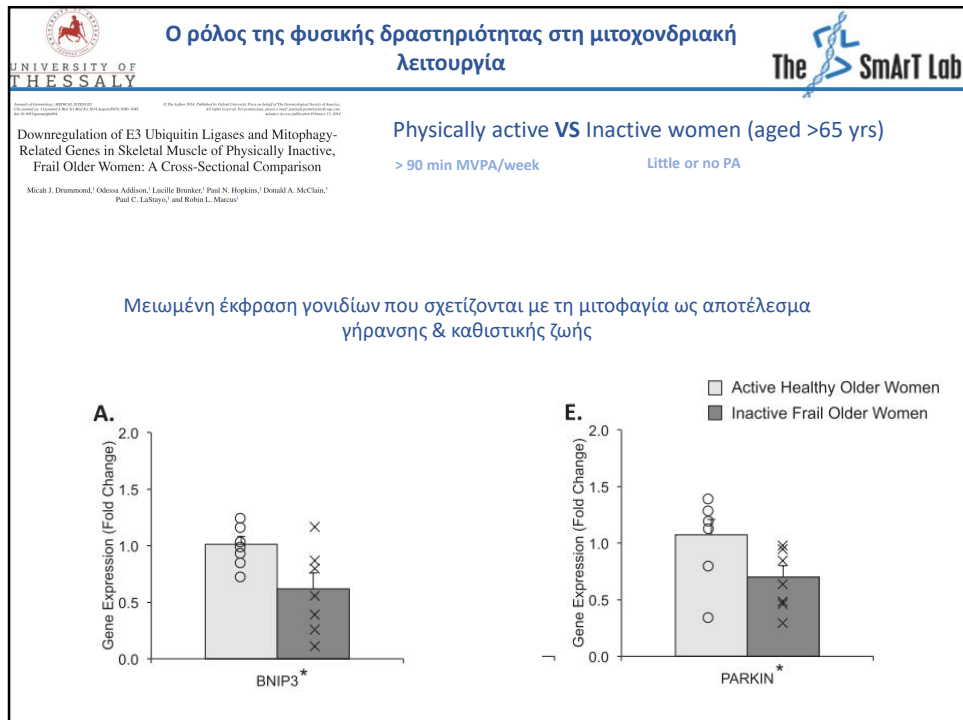
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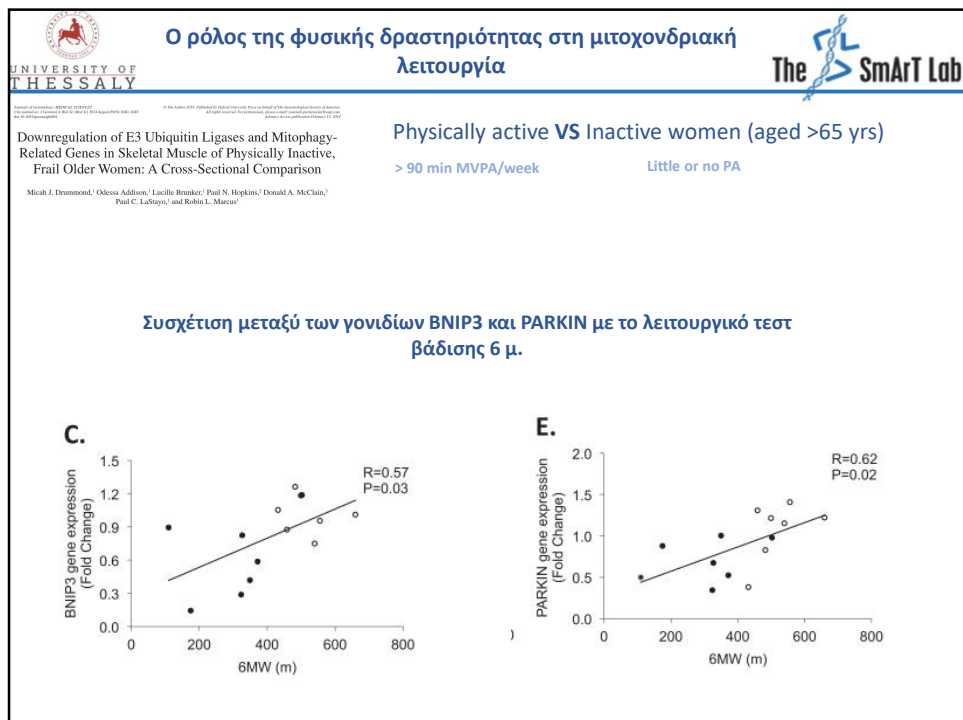
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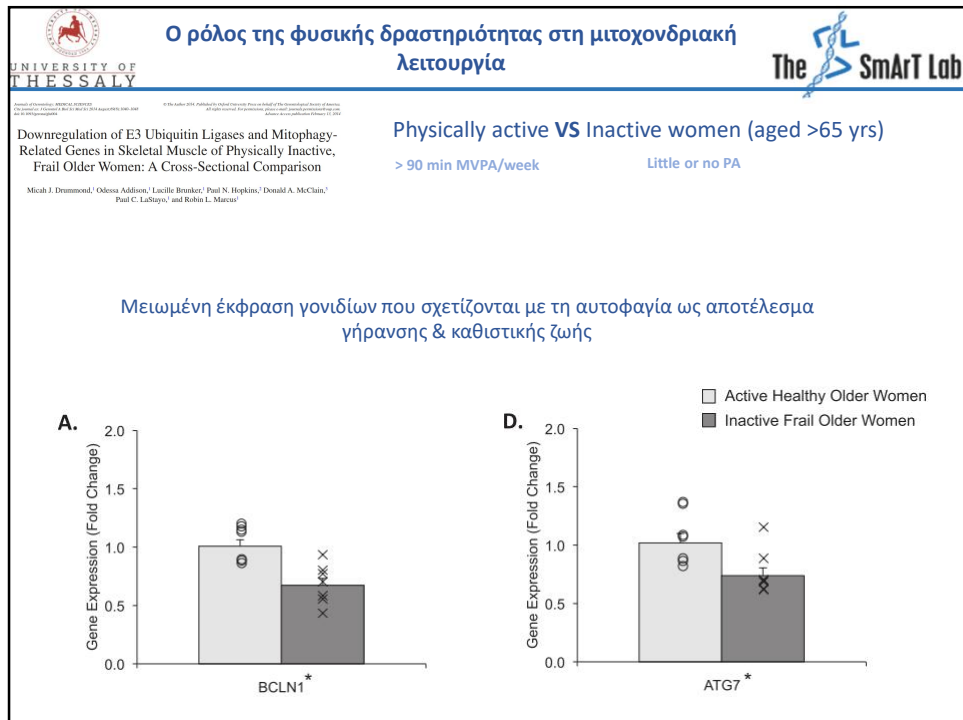
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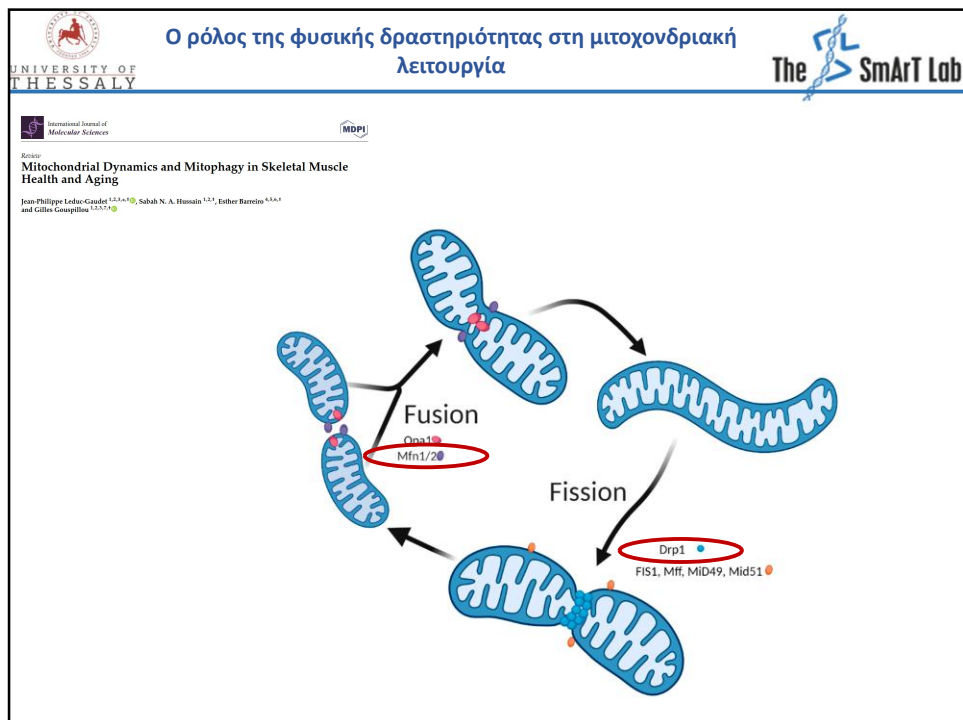
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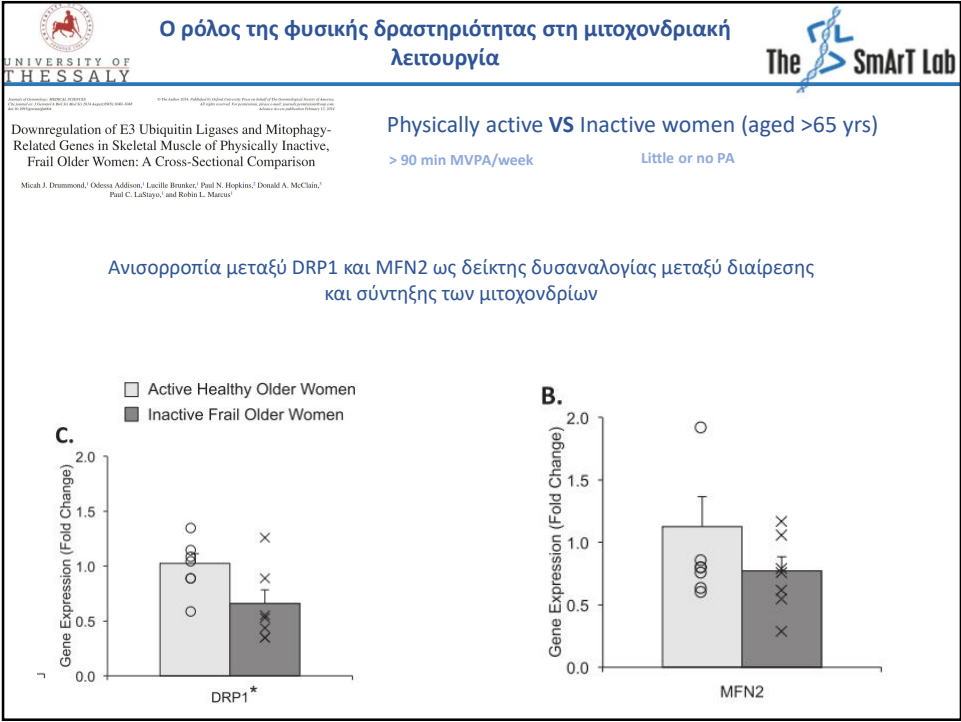
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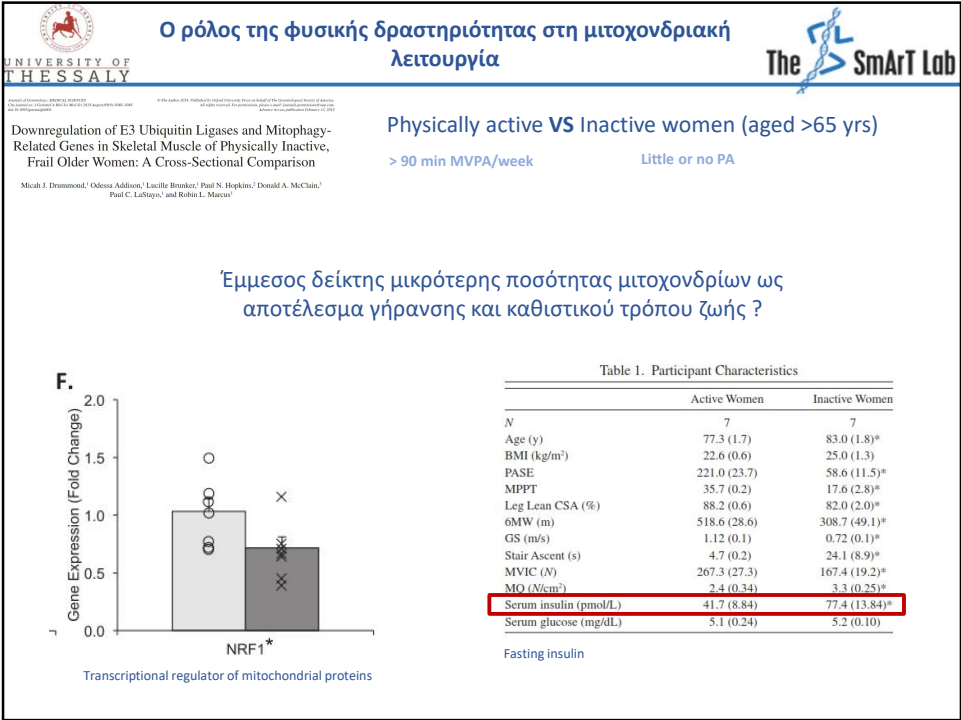
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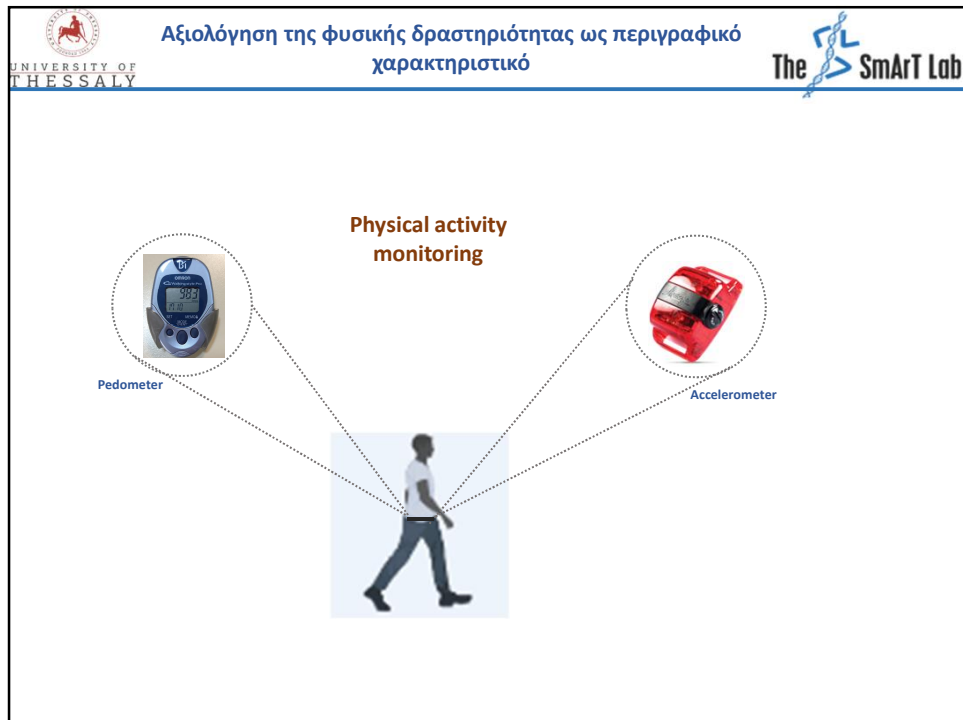
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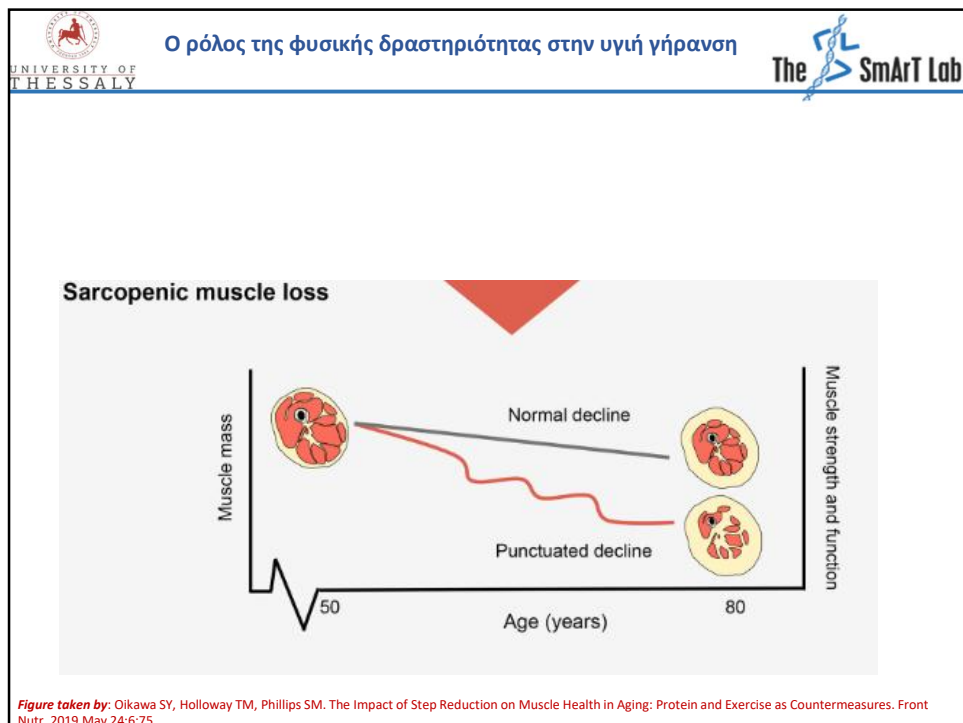
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Σ.Ε.Φ.Α.Α.Δ – Π.Θ



T.E.Φ.Α.Α.



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