

Table S1. Systematic review search strategy for PUBMED

| Category | Number | Search Term |
|--------------|--------|---|
| Population | #1 | Muscle disorder* [Mesh] |
| | #2 | Cachexia [Mesh] |
| | #3 | Sarcopenia [Mesh] |
| | #4 | COPD [Mesh] |
| | #5 | Muscle atrophy* [Mesh] |
| | #6 | Aging [Mesh] |
| | #7 | Skeletal muscle disease* [Text word] |
| | #8 | Healthy aging [Text word] |
| | #9 | Skeletal muscle dysfunction [Text word] |
| | #10 | Muscle wasting [Text word] |
| | #11 | #1-10 (OR) |
| Intervention | #12 | Exercise [Mesh] |
| | #13 | Physical activit* [Mesh] |
| | #14 | Aerobic exercise* [Mesh] |
| | #15 | Resistance training [Mesh] |
| | #16 | Physical exertion [Mesh] |
| | #17 | Inactivity [Text word] |
| | #18 | HIIT [Text Word] |
| | #19 | Acute bout [Text Word] |
| | #20 | Repeated bout [Text word] |
| | #21 | Endurance training [Text word] |
| | #22 | Mechanical loading [Text word] |

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| | #23 | #12-22 (OR) |
| Outcome | #24 | Extracellular matrix proteins [Mesh] |
| | #25 | Extracellular matrix [Mesh] |
| | #26 | Myogenic satellite cells [Mesh] |
| | #27 | Skeletal muscle regeneration [Text Word] |
| | #28 | Skeletal muscle remodel* [Text Word] |
| | #29 | Extracellular matrix remodel* [Text Word] |
| | #30 | #24-29 (OR) |
| | #31 | Legs |
| | #32 | Muscle, skeletal [Mesh] |
| | #33 | Muscle, quadriceps [Text Word] |
| | #34 | Peripheral muscle*[Text Word] |
| | #35 | Locomotor muscle* [Text Word] |
| | #36 | #31-35 (OR) |
| | #37 | 30 AND 36 |

Table S2. Changes in ECM-related molecules after exercise training intervention.

| First author, year of publication | Outcome measure | Δ ECM outcome within group (pre-to-post exercise) |
|-----------------------------------|------------------------|---|
| Damas <i>et al.</i> , 2018 [24] | <i>mRNA expression</i> | |
| | <i>Miscellaneous</i> | |
| | COLEC12 | ↑ 82% ($p < 0.05$) |
| | MXRA5 | ↑ 188% ($p < 0.05$) |
| Hjorth <i>et al.</i> , 2015 [26] | <i>mRNA expression</i> | |
| | <i>Miscellaneous</i> | |
| | ADAMTS7 | ↑ 80% ($p < 0.001$) |
| | ADAMTS15 | ↑ 60% ($p < 0.001$) |
| | ADAMTS8 | ↑ 60% ($p < 0.001$) |
| | ADAMTSL3 | ↑ 60% ($p < 0.001$) |
| | ADAMTS2 | ↑ 60% ($p < 0.001$) |
| | SERPINE1 | ↑ 60% ($p < 0.001$) |
| | SERPINH1 | ↑ 50% ($p < 0.001$) |
| | MMP14 | ↑ 50% ($p < 0.001$) |
| | IGFBP2 | ↑ 60% ($p < 0.001$) |
| | IGFBP3 | ↑ 70% ($p < 0.001$) |
| | KCP | ↑ 70% ($p < 0.001$) |
| | WISP1 | ↑ 90% ($p < 0.001$) |
| | MXRA5 | ↑ 280% ($p < 0.001$) |
| | CLEC10A | ↑ 70% ($p < 0.001$) |
| | LOXL2 | ↑ 220% ($p < 0.001$) |
| | LOX | ↑ 200% ($p < 0.001$) |
| | LOXL3 | ↑ 50% ($p < 0.001$) |

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|--------------------------------|------------------------|-----------------------------|
| Kern <i>et al.</i> , 2014 [29] | AEBP1 | ↑ 50% ($p < 0.001$) |
| | VWA1 | ↑ 70% ($p < 0.001$) |
| | ITIH3 | ↑ 70% ($p < 0.001$) |
| | <i>mRNA expression</i> | |
| Raue <i>et al.</i> , 2012 [36] | <i>Miscellaneous</i> | |
| | IGF-1 Ea | ↑ ($p < 0.005$) |
| | IGF-1 Eb | ↑ ($p < 0.05$) |
| | IGF-1 Ec | ↑ ($p < 0.005$) |
| | IGF-1 pan | ↑ ($p < 0.005$) |
| | <i>mRNA expression</i> | |
| | <i>Miscellaneous</i> | |
| | ADAMTS12 | Young: N/A Older: ↑ 125% |
| | CLEC1A | Young: N/A Older: ↑ 53% |
| | IGFBP2 | Young: N/A Older: ↑ 77% |
| | IGFBP7 | Young: N/A Older: ↑ 103% |
| | ITGB1BP3 | Young: ↑ 161% Older: N/A |
| | ITGA6 | Young: N/A Older: ↑ 73% |

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|------------------------------------|--|---|
| | LOX | Young: N/A Older: ↑ 250% |
| | LOXL2 | Young: N/A Older: ↑ 103% |
| | MXRA5 | Young: N/A Older: ↑ 165% |
| | KDR | Young: N/A Older: ↑ 63% |
| | TFPI2 | Young: N/A Older: ↑ 156% |
| Riedl <i>et al.</i> , 2010 [37] | <i>Number of tags per 100000 SAGE tags</i> | |
| | <i>Miscellaneous</i> | |
| | IGFN1 | ↑ 12 |
| Robinson <i>et al.</i> , 2017 [38] | <i>mRNA expression</i> | |
| | <i>Miscellaneous</i> | |
| | ITGB2 | HIIT young: (NS) HIIT older: ↑67% (p≤0.05) RET young: (NS) RET older: (NS) CT young: (NS) CT older: (NS) |

INS-IGF2

HIIT young: (NS)
HIIT older: ↑74% (p≤0.05)
RET young: (NS)
RET older: (NS)
CT young: (NS)
CT older: (NS)

IGF2

HIIT young: (NS)
HIIT older: ↑81% (p≤0.05)
RET young: (NS)
RET older: (NS)
CT young: (NS)
CT older: (NS)

Timmons *et al.*, 2010 [39]

mRNA expression

Miscellaneous

ADAMTS1
ADAMTS9
ADAMTSL3
COLEC12
IGF1
IGF2
IGFBP3
IGFBP4
IGFBP7
ITGA5
ITGA6
ITGB1

↑ 270%
↑ 80%
↑ 50%
↑ 80%
↑ 70-250%
↑ 220-320%
↑ 90-200%
↑ 50%
↑ 70-230%
↑ 210%
↑ 50-470%
↑ 80%

| | |
|--------|--------|
| SMOC2 | ↑ 70% |
| SPOCK1 | ↑ 60% |
| TIMP1 | ↑ 230% |
| TIMP2 | ↑ 50% |

Valdivierso *et al.*, 2017 [40]

Protein expression

Miscellaneous

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|--------------------------------------|---|
| Vascular endothelial growth factor A | A/A alleles: (NS) A/T alleles: ↑ T/T alleles: ↑ |
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mRNA expression

Miscellaneous

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|---------|---|
| VEGF-R2 | A/A alleles: ↑ 54% A/T alleles: (NS) T/T alleles: (NS) |
| TIMP1 | A/A alleles: (NS) A/T alleles: (NS) T/T alleles: ↑ 132% |
| PGF | A/A alleles: (NS) A/T alleles: (NS) T/T alleles: ↑ 65% |
| FGF R4 | A/A alleles: (NS) A/T alleles: (NS) T/T alleles: ↑ 169% |

Walton *et al.*, 2019 [41]

mRNA expression

Miscellaneous

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| MMP2 | ↑ 33.7% ($p = 0.032$) |
| MMP14 | ↑ 60.5% ($p = 0.01$) |
| TIMP2 | ↑ 26.4% ($p = 0.031$) |
| HGF | ↑ 43.7% ($p = 0.005$) |
| IGF1 | ↑ 21.4% ($p = 0.035$) |
| TGFβ1 | ↑ 39% ($p < 0.001$) |
| LOX | ↑ 36.3% ($p = 0.002$) |
| SERPINE1 | ↑ 35% ($p = 0.04$) |
