**LEAN MASS, MUSCLE STRENGTH AND GENE EXPRESSION IN COMMUNITY DWELLING OLDER MEN**

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**Abstract**

Introduction: Sarcopenia is associated with morbidity and mortality. Cellular pathways involved in the regulation of growth and atrophy affect myofibre size and subsequently, muscle strength. The objective of this study was to investigate whether skeletal muscle gene expression was associated with altered lean mass and grip strength in community-dwelling older men.

**Methods:** 99 men (mean age 72 years) consented for detailed characterisation of muscle mass and strength as well as a muscle biopsy of the vastus lateralis. Tissue suitable for molecular analysis was available from 88 participants. PCR arrays on muscle tissue were used to determine the expression of 44 genes implicated in the cellular regulation of skeletal muscle. The relationships between gene expression, lean mass and grip strength were described.

**Results:** Participant groups with extreme values of lean mass (n = 18) and grip strength (n = 20) were used in the analysis of fold change in gene expression. Expression of VDR (vitamin D receptor) (fold change [FC] 0.52, standard error for fold change [SE] ±0.08, p = 0.01) and INFG (interferon gamma) mRNA (FC 0.31; SE ±0.19, p = 0.01) were lower in those with higher lean mass. Expression of IL6 (interleukin 6) (FC 0.43; SE ±0.13, p = 0.02), TNF (tumour necrosis factor) (FC 0.52; SE ±0.10, p = 0.02), IL1R (interleukin 1 receptor) (FC 0.63; SE ±0.09, p = 0.04) and MSTN (myostatin) (FC 0.64; SE ±0.11, p = 0.04) were lower in those with higher grip strength. No other significant changes in fold change were seen.

**Conclusion:** Lower expression of VDR and INFG associated with higher lean mass and lower expression of IL6, TNF, IL1R and myostatin associated with higher grip strength. These results suggest a role for inflammation in the regulation of muscle mass and strength. Replication studies in larger study samples of men and women are now needed