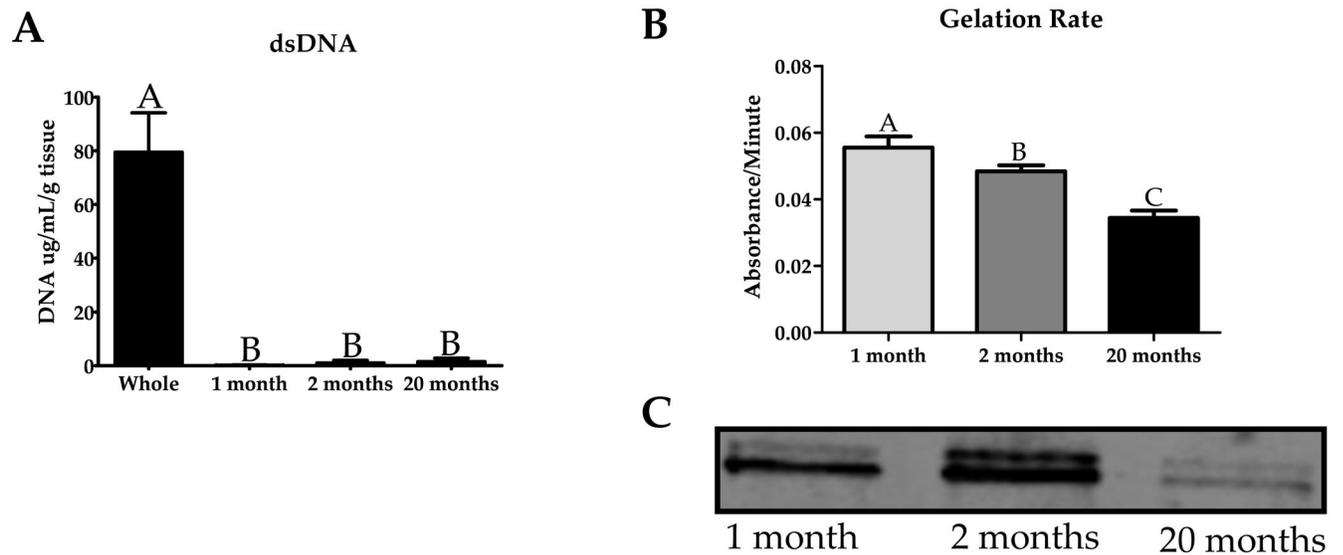
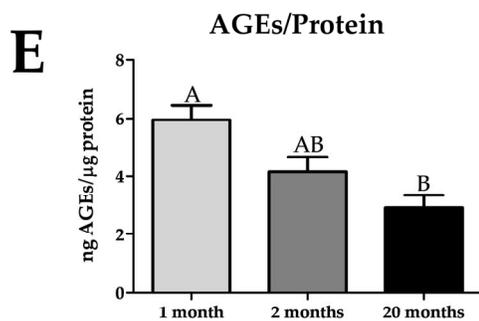
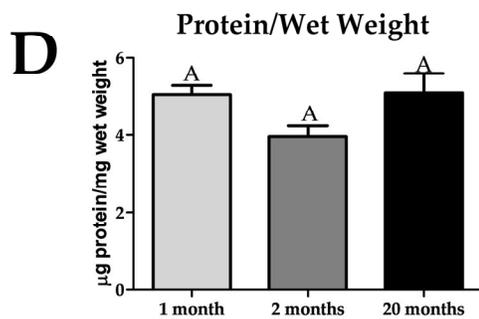
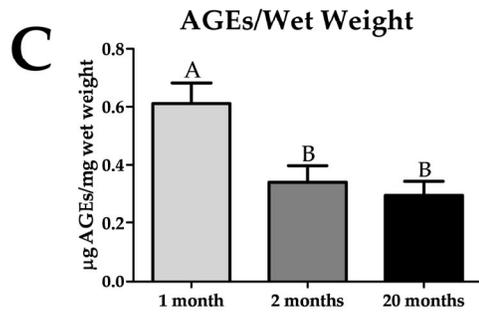
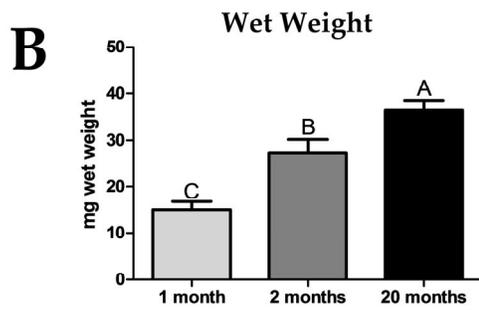
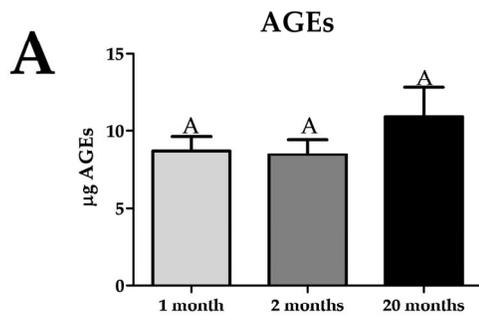


Supplementary Figure S1: Whole histological cross-sections of gastrocnemii of differing ages stained with H&E and Picrosirius Red. (A) H&E stained cross-sections show an increase in muscle size when comparing 2 and 20 months to 1 month. (B) Picrosirius red cross-sections. The scale bar is 1 mm and applies to all images.

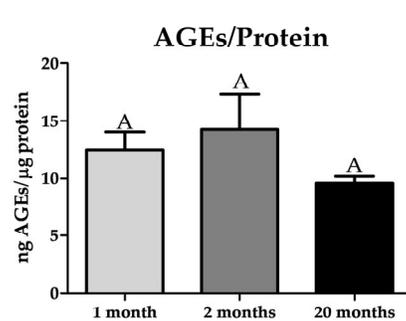
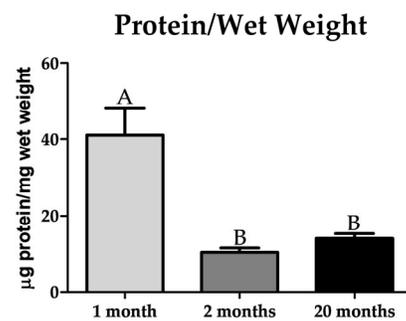
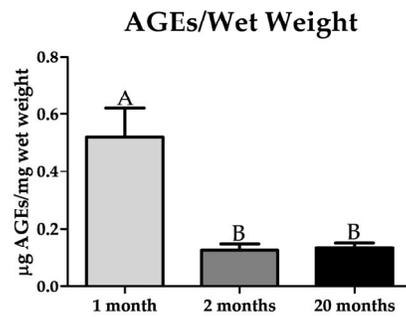
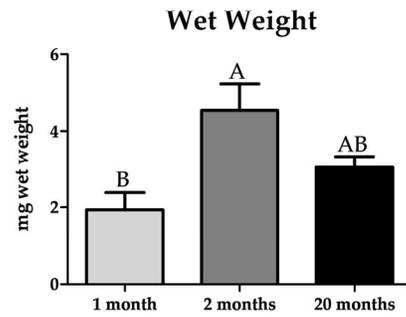
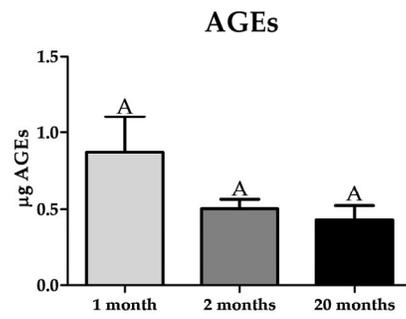


Supplementary Figure S2: Processed DMM gels are successfully decellularized and show age-dependent reductions in gelation rate and soluble procollagen. (A) dsDNA levels in 1-month, 2-month, and 20-month DMM pregels are significantly reduced compared to whole muscle. (B) Gelation rate significantly decreases with increasing age, indicating a reduction in collagen polymerization ability with age. (C) Procollagen was reduced in 20-month DMM pregels compared to 1 and 2-months.

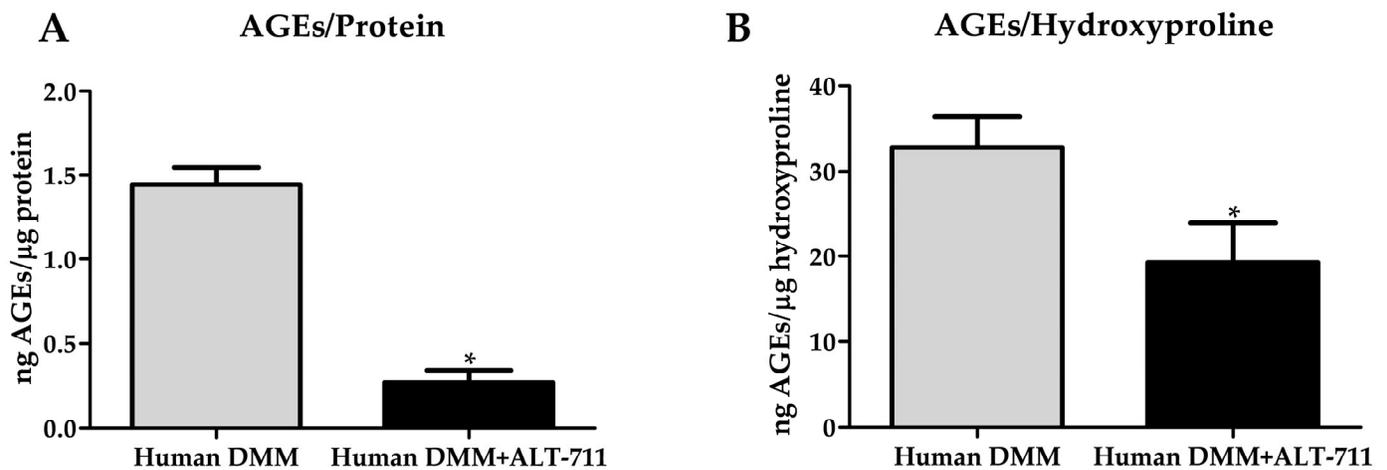
Whole Muscle



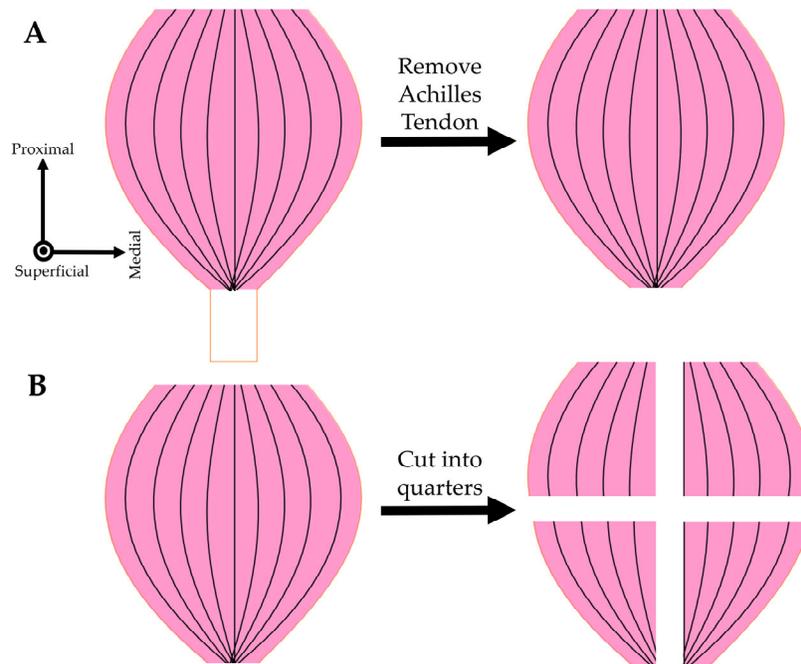
DMM



Supplementary Figure S3: Absolute AGE levels with differing normalization methods in whole muscle and DMM. **(A)** Absolute AGE levels (no normalization) did not change in whole muscle and DMM between different ages. **(B)** Wet weight of the samples increases with age in whole muscle, and increases from 1-month to 2-month in DMM. **(C)** AGEs per wet weight decreased from 1-month levels in the 2-month and 20-month groups for both whole muscle and DMM. **(D)** Protein extracted per weight was not different for whole muscle, but decreased in the 2-month and 20-month DMM compared to 1-month DMM. **(E)** AGEs per protein decreased in the 20-month whole muscles compared to 1-month, and there was no change for DMM. Groups that do not share a letter (e.g. A, B, or C) are statistically different according to a one-way ANOVA followed by a two-tailed Tukey's correction.



Supplementary Figure S4: ALT-711 treatment reduces AGEs in human DMM when normalized to protein and hydroxyproline levels. **(A)** AGEs per protein was reduced in human DMM is treated with ALT-711. **(B)** AGEs per hydroxyproline was reduced in human DMM treated with ALT-711. * = statistically different to the control group (DMM without ALT-711) according to a two-tailed unpaired t-test ($p < 0.05$).



Supplementary Figure S5: Whole muscle preparation for decellularization. (A) The Achilles tendon was removed. (B) The gastrocnemius was cut into quarters.

Table S1: Number of myofibers, nuclei counted and measurement error for histomorphometry.

Group	# of myofibers (mean \pm SEM)	Myofiber diameter (mean \pm SEM)	# of nuclei (mean \pm SEM)
1 month	25 \pm 5.57	24.25 \pm 0.82 μ m	79.33 \pm 3.84
2 months	11.33 \pm 0.33	34.27 \pm 1.12 μ m	58.67 \pm 7.42
20 months	13.33 \pm 2.03	32.90 \pm 2.84 μ m	36.67 \pm 4.91