

Supplemental Table

Geometrical and material parameters most relevant to the agreement between the model and the experimental measurements of A-band deflections

Parameter	Effect on A-band deflections
The tensile modulus of the stiff region of the endomysium ($C_1^{(\text{stiff region of endomysium})}$ in Table 2)	The endomysium surrounding the fiber at the tendon had to be stiffer than the fiber ($C_1^{(\text{stiff region of endomysium})} / C_1^{(\text{fiber})} > 1$) for the A-bands in the model to curve away from the tip of the fiber at the MTJ similar to the experimentally observed A-bands in the stretched fibers. In the absence of this condition and in the presence of tapering, the A-bands will curve towards the fiber tip. The maximum value of δ / d was highly dependent on $C_1^{(\text{stiff region of endomysium})}$ and was higher for larger $C_1^{(\text{stiff region of endomysium})}$.
Tapering	The presence of tapering was necessary for reproducing the curve describing δ / d versus l / d . In the absence of tapering a much flatter curve than in Fig. 5B results. The maximum value of δ / d was highly dependent on the amount of tapering and was higher for larger amounts of taper.
The tensile modulus of the compliant region of the endomysium ($C_1^{(\text{compliant region of endomysium})}$ in Table 2)	The endomysium surrounding the fiber away from the tendon had to be more compliant than the fiber $C_1^{(\text{compliant region of endomysium})} / C_1^{(\text{fiber})} < 1$. In the absence of this condition a much flatter curve than in Fig. 5B results.

<p>The lengths of the stiff region of endomysium (Fig. 3A inset)</p>	<p>The maximum value of δ/d and the value of l/d for which δ/d reached a maximum were highly dependent on this length. The value of l/d for which δ/d reached a maximum increased with increasing length of the stiff region. The maximum value of δ/d initially increased with increasing length of the stiff region as long as the length of the stiff region was smaller than the length of the tapered part of the fiber, after which point it gradually decreased.</p>
<p>The lengths of the transition region of endomysium (Fig. 3A inset)</p>	<p>The maximum value of δ/d and the value of l/d for which δ/d reached a maximum were dependent on this length. The maximum value of δ/d initially increased with increasing length of the transition region and very gradually decreased after reaching a maximum. The length of the fiber over which δ/d decreased back to zero also increased with increasing length of the transition region.</p>