

**Figure S1.** The metabolic cost function for muscle,  $F_{\text{iso}} v_{\text{max}} \Phi(v/v_{\text{max}})$ , calculated from eq. 12 in ref. 13 from  $v/v_{\text{max}}$ , for  $F_{\text{iso}} = 1$ . The relationship between  $v$  and cost is complex, but concentric contractions ( $v > 0$ ) generally require more energy than isometric ( $v = 0$ ) or eccentric ( $v < 0$ ) contractions.

