



Fig. S1. Tendon fibril structure in mature *Col11a1*^{+/-} tendons. (A) Collagen fibril structure was analyzed in the tendons from *Col11a1*^{+/-} mice at P30 using transmission electron microscopy. *Col11a1*^{+/-} tendons had a heterogeneous population of fibrils. There was a significant number of small diameter fibrils. In addition, large diameter fibrils with near circular to modestly irregular fibril cross sections (arrow) were present. Fibril structure was comparable to that in *Col5a1*^{+/-} tendons (Fig. 2B). (B) Fibril diameter distributions of tendons at P30 had a broad, heterogeneous population of fibrils with a bimodal distribution in *Col11a1*^{+/-} mice. The *Col11a1*^{+/-} tendons demonstrated a subpopulation of small diameter fibrils. In addition, there was a second subpopulation composed of larger fibrils with a heterogeneous distribution of diameters. Overall, the distribution was comparable to that from *Col5a1*^{+/-} tendons, but with an increased number of small diameter fibrils (Fig 2E).