Supplementary Figure 1: (A) Schematic representation of the Gran Sasso D'Italia vertical run, consisting of a race covering a horizontal distance of 3.6 km, while ascending for 1030 m, averaging 29.5% slope. Blood was collected right before and after the race. **(B)** Serum levels of LCN2 before the race between amateur and professional runners. Unpaired Student's *t*-test.

Supplementary Figure 2: Lcn2 expression in mouse muscle tissues. Western blot analyses were run on diaphragm, quadricep, EDL and *soleus* muscle tissue lysates as described in main Figure 2. **(A)** Ponceau S staining of the blot. **(B)** Full blot signal after overnight incubation (at 4°C) with anti-LCN2 antibody. **(C)** Full blot signal after 1h incubation (at R.T.) with anti-β-actin. Stripping was not performed between the two incubations.

Supplementary Figure 3: Effect of the lack of Lcn2 on muscle phenotype. After sacrifice, **(A)** quadricep, **(B)** EDL, **(C)** *soleus*, **(D)** *tibialis anterior* and **(E)** diaphragm muscles from WT and *Lcn2*$^{-/-}$ mice (at the ages indicated in the abscissa) were weighted and plotted as % of body weight. Curve fitting test.

Supplementary Figure 4: Bmp2 transcriptional expression in WT and *Lcn2*$^{-/-}$ muscles. RNA was extracted from 3- and 12-month-old WT and *Lcn2*$^{-/-}$ mice muscles. One µg of total RNA was reverse transcribed into cDNA and used to analyse transcriptional expression of bone morphogenic protein 2 (*Bmp2*) by real time RT-PCR. N=3-5 per group. Student's *t*-test.

Supplementary Figure 5: Schematic representation of the findings of the present study.