

Supplementary Table

(a) Structural Parameters measured by Microcomputed Tomography

	Mice	No. of mice	BV/TV (%)	Tb.N. (N/mm)	Tb.Th. (μm)	Tb.Sp. (μm)	Conn-Dens (1/mm ³)	Cortical thickness (mm)	Cortical Bone area (mm ²)
Femur	WT	6	12.3 \pm 0.62	5.24 \pm 0.208	43 \pm 0.11	192 \pm 7.4	133 \pm 21.9	0.184 \pm 0.009	0.74 \pm 0.053
	KO	6	18.4 \pm 1.98*	7.04 \pm 0.371*	43 \pm 2.47	138 \pm 9.5*	296 \pm 44.5*	0.214 \pm 0.010*	0.83 \pm 0.056
Tibia	WT	8	11.1 \pm 1.17	5.99 \pm 0.283	39 \pm 1.06	167 \pm 8.1	107 \pm 23.0	0.226 \pm 0.005	0.59 \pm 0.022
	KO	8	19.9 \pm 3.22*	8.02 \pm 0.371*	41 \pm 2.12	121 \pm 7.1*	305 \pm 45.6*	0.238 \pm 0.007	0.63 \pm 0.030
Vertebrae (L1)	WT	8	18.1 \pm 1.13	5.54 \pm 0.145	41 \pm 0.71	179 \pm 4.9	270 \pm 17.3		
	KO	8	34.0 \pm 1.77*	7.03 \pm 0.187*	52 \pm 1.41*	135 \pm 4.2*	345 \pm 18.0*		

* $P < 0.05$ (Only the columns marked with * show statistical differences)

(b) Static histomorphometric parameters of bone structure in femur of wild-type (WT) and *Atp6v0d2*^{-/-} (KO) mice.

	No. of mice	BV/TV (%)	Obs/BS (%)	OcS/BS (%)	NOc/BPm (N/mm ²)	Tb.Th. (μm)	Tb.Sp. (μm)	Tb.N. (N/mm)
WT	4	9.84 \pm 0.69	14.6 \pm 1.52	10 \pm 0.8	4.1 \pm 0.72	33.9 \pm 3.0	247.5 \pm 34.5	3.7 \pm 0.42
KO	4	24.2 \pm 1.37 [†]	26.8 \pm 3.15*	4.55 \pm 0.51 [†]	3.15 \pm 0.98	40.9 \pm 5.23	133.4 \pm 5.41*	5.22 \pm 0.25*

[†] $P < 0.01$, * $P < 0.05$ (Only the columns marked with * or [†] show statistical differences)

(c) Comparison of TRAP⁺ osteoclasts (OCs) in femur of WT and *Atp6v0d2*^{-/-} mice.

	No. of bone sections	Total No. of OCs per section	No. of multinucleated OCs per section	No. of mononuclear OCs per section	Average nuclei/OC
WT	8	41 \pm 2.67	13.1 \pm 1.77	28 \pm 1.63	2 \pm 0.06
KO	8	40 \pm 2.25	4.17 \pm 1.29*	35.9 \pm 2.22 [†]	1.38 \pm 0.1 [‡]

* $P < 0.0005$, [†] $P < 0.005$, [‡] $P < 0.0001$ (Only the columns marked with *, [†] or [‡] show statistical differences).

Two representative sections of each mouse (4 mice from each genotype) were scored for the presence of TRAP⁺ multinuclear (containing more than 3 nuclei) and mononuclear cells. All measurements were confined to the growth plate-metaphyseal junction of the distal femur.

(d) Dynamic histomorphometric parameters of bone formation in femur of WT and *Atp6v0d2*^{-/-} mice.

Mice	No. of mice	BV/TV (%)	sLS/BS (%)	dLS/BS (%)	IrLTh (μm)	MS/BS (%)	MAR ($\mu\text{m}/\text{d}$)	BFR/BS ($\mu\text{m}^3/\mu\text{m}^2/\text{d}$)
WT	5	8.92 \pm 0.45	26.02 \pm 1.53	6.17 \pm 1.47	9.52 \pm 1.09	20.58 \pm 1.78	1.36 \pm 0.16	0.28 \pm 0.05
KO	4	25.53 \pm 1.33 [†]	25.50 \pm 2.04	12.97 \pm 1.71*	15.51 \pm 1.45*	25.72 \pm 2.59	2.22 \pm 0.21*	0.55 \pm 0.04 [†]

[†] $P < 0.01$, * $P < 0.05$ (Only the columns marked with * or [†] show statistical differences)