***Supplementory Table 1****: Microarchitectural parameters of tibias from WT and Ctns-/- rats as determined by microCT. Unpaired t-test performed. Values are means ± SEM. \* p<0.05 vs. WT.*

|  |  |  |
| --- | --- | --- |
|  | 12 month | 17 month |
| Females | WT (n=5) | *Ctns*-/- (n=9) | WT (n=5) | *Ctns*-/- (n=6) |
| Tibia length (mm) | 41.5 ± 0.5 | 40.7 ± 0.6 | 42.6± 0.3 | 40.5 ± 1.4 |
| Proximal tibia trabecular bone |  |  |  |  |
| Bone volume fraction (%) | 20.2 ± 2.3 | 19.6 ± 1.8 | 23.4 ± 2.0 | 17.7 ± 3.4 |
| Trabecular thickness (µm) | 78.6 ± 3.5 | 72.2 ± 2.2 | 102.5 ± 3.7 | 83 ± 2.8\* |
| Trabecular separation (µm) | 257 ± 18 | 267 ± 13 | 311 ± 37 | 448 ± 95 |
| Trabecular number (1/mm) | 2.55 ± 0.21 | 2.69 ± 0.19 | 2.32 ± 0.29 | 2.11 ± 0.37 |
| Connectivity density (1/mm3) | 100.6 ± 12.1 | 139.4 ± 12.0\* | 50.8 ± 16.1 | 53.5 ± 10.5 |
| Tibia cortical bone |  |  |  |  |
| Cross-sectional tissue area (mm2) | 7.1 ± 0.2 | 6.3 ± 0.3 | 7.3 ± 0.3 | 6.3 ± 0.3\* |
| Cross-sectional bone area (mm2) | 4.9 ± 0.1 | 4.3 ± 0.2 | 5.3 ± 0.2 | 3.9 ± 0.2\* |
| Cortical thickness (µm) | 439.8 ± 19.7 | 409.9 ± 14.2 | 524.0 ± 12.0 | 399.1 ± 20.1\* |
| Medullary area (mm2) | 2.2 ± 0.2 | 2.0 ± 0.2 | 2.0 ± 0.1 | 2.4 ± 0.2 |
| Cortical tissue mineral density (g/cm3) | 1.348 ± 0.009 | 1.343 ± 0.008 | 1.320 ± 0.324 | 1.341 ± 0.013 |
| Polar moment of inertia (mm4) | 10.1 ± 0.2 | 7.7 ± 0.7\* | 11.0 ± 0.8 | 7.4 ± 0.6\* |
|  | **12 month** |  |  |
| Males | WT (n=6) | *Ctns*-/- (n=8) |  |  |
| Tibia length (mm) | 48.7 ± 0.6 | 48.6 ± 0.9 |  |  |
| Proximal tibia trabecular bone |  |  |  |  |
| Bone volume fraction (%) | 11.1 ± 0.6 | 10.7 ± 1.4 |  |  |
| Trabecular thickness (µm) | 96.2 ± 5.1 | 78.9 ± 3.3\* |  |  |
| Trabecular separation (µm) | 530.0 ± 35.1 | 479.4 ± 59.4 |  |  |
| Trabecular number (1/mm) | 1.17 ± 0.10 | 1.36 ± 0.17 |  |  |
| Connectivity density (1/mm3) | 24.5 ± 4.4 | 47.1 ± 8.2\* |  |  |
| Tibia cortical bone |  |  |  |  |
| Cross-sectional tissue area (mm2) | 13.3 ± 0.5 | 12.7 ± 0.7 |  |  |
| Cross-sectional bone area (mm2) | 7.6 ± 0.1 | 7.1 ± 0.3 |  |  |
| Cortical thickness (µm) | 483.1 ± 17.8 | 452.4 ± 16.0 |  |  |
| Medullary area (mm2) | 5.7 ± 0.5 | 5.6 ± 0.5 |  |  |
| Cortical tissue mineral density (g/cm3) | 1.319 ± 0.003 | 1.310 ± 0.002\* |  |  |
| Polar moment of inertia (mm4) | 29.2 ± 1.4 | 26.4 ± 2.2 |  |  |