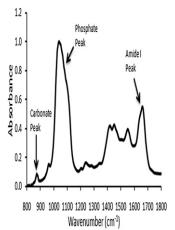
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 $^{\rm Fig.~E-1}$  Typical FTIR spectrum of bone. Spectra were analyzed with use of the carbonate peak (indicating carbonate substitution into hydroxyapatite) between 850 and 890 cm $^{-1}$ , the phosphate peak (mineral) between 900 and 1200 cm $^{-1}$ , and the amide I peak (matrix) between 1590 and 1720 cm $^{-1}$ .

	Non-Low BMD (Group 1, $N = 25$ )*	P Value, 1 vs. 2	Low BMD (Group 2, N = 18)*	P Value, 2 vs. 3	Controls (Group 3, $N = 14$ )*	P Value, 1 vs. 3
Cancellous bone volume/tissue volume (%)	20.9 ± 4.41	0.001	$14.9 \pm 4.13$	0.01	$20.1 \pm 4.12$	>0.1
Trabecular separation (μm)	$429 \pm 86.3$	0.001	$620\pm242$	0.01	$428 \pm 69.1$	>0.1
Trabecular thickness (μm)	$114\pm23.4$	>0.1	$100\pm17.8$	>0.1	$107 \pm 23.9$	>0.1
Bone formation rate/bone surface area (mm³/cm²/yr)	$1.34 \pm 0.98$	>0.1	$1.41 \pm 1.33$	>0.1	$1.97\pm0.99$	>0.1
Osteoid thickness (µm)	$10.3\pm4.23$	>0.1	$9.73 \pm 3.87$	>0.1	$9.08 \pm 3.49$	>0.1
Mineralization lag time (d)	$40.3 \pm 39.3$	>0.1	$31.2 \pm 16.1$	>0.1	$47.0 \pm 29.8$	>0.1

	Non-Low BMD (Group 1, $N = 25$ )*	P Value, 1 vs. 2	Low BMD (Group 2, $N = 18$ )*	P Value, 2 vs. 3	Controls (Group 3, N = 14)*	P Value 1 vs. 3
Collagen crosslinking ratio	$4.12 \pm 0.46$	<0.001	$3.58 \pm 0.33$	>0.1	$3.60 \pm 0.30$	<0.001
Mineral-to-matrix ratio	$4.16 \pm 0.39$	>0.1	$3.93 \pm 0.61$	>0.1	$3.83 \pm 0.44$	>0.1
Carbonate-to-phosphate ratio $ imes$ 100	$1.04\pm0.08$	>0.1	$1.03 \pm 0.13$	>0.1	$1.09\pm0.08$	>0.1
Crystallinity	$0.88 \pm 0.04$	>0.1	$0.88 \pm 0.08$	>0.1	$0.89 \pm 0.03$	>0.1

<sup>\*</sup>The values are given as the mean and the standard deviation.