

Supporting Information

Lead-free $\text{Bi}_{5-x}\text{La}_x\text{Ti}_3\text{FeO}_{15}$ ($x=0, 1$) nanofibers toward wool keratin-based biocompatible piezoelectric nanogenerators

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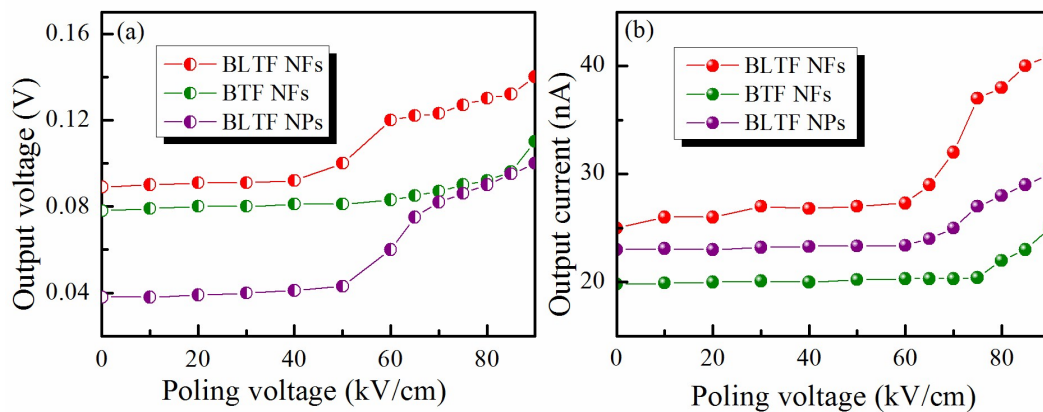


Figure S1. Poling voltage dependence of piezoelectric output (a) voltage and (b) short current of the resultant NGs after electric poling for 40 min at 80 °C.

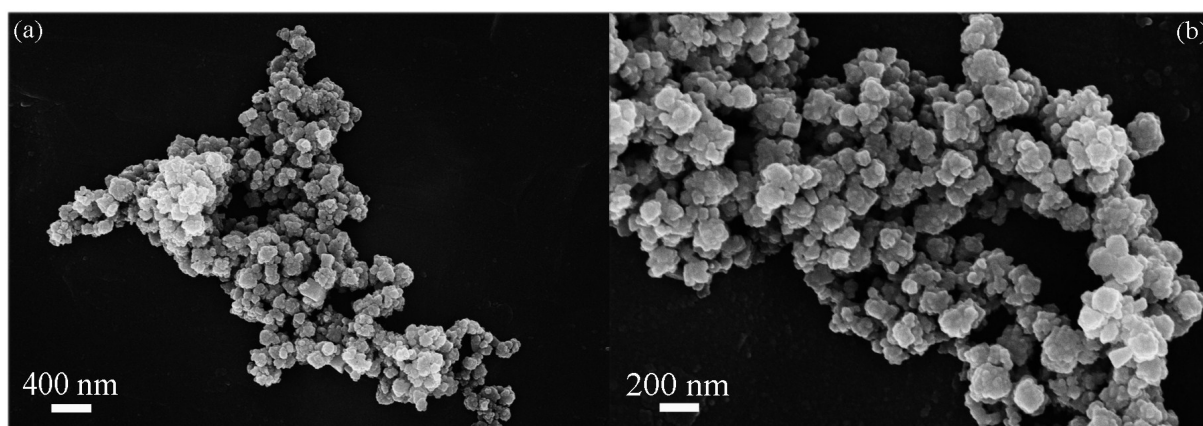


Figure S2. SEM patterns of BLTF NPs.

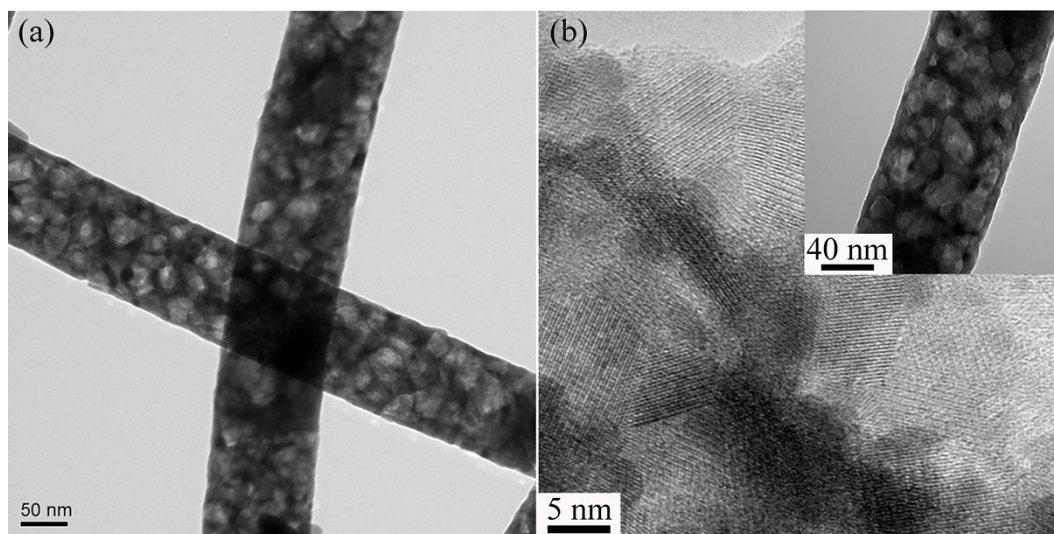


Figure S3. TEM (a) and high-resolution TEM (b) images of BTF NFs.

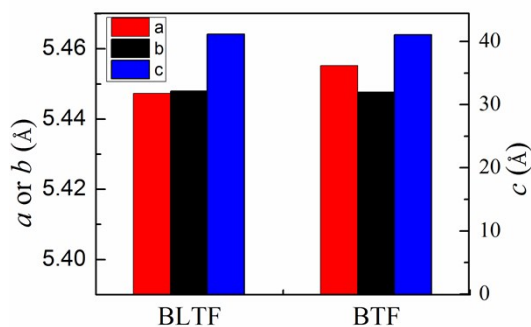


Figure S4. The refined lattice parameters (a , b and c) of BTF and BLTF NFs.

Table S1. Atomic coordinates, atomic occupancies and isotropic thermal parameters of BTF NFs at room temperature

Atom	Site	x	y	z	$100U_{iso}/\text{\AA}^2$	Occupancy
Bi1	4a	0.25	0.7514(18)	0	1.01(9)	1
Fe1	8b	0.249(14)	0.251(7)	0.0539(4)	0.66(24)	0.25
Bi2	8b	0.2387(30)	0.7270(8)	0.21677(7)	1.03(5)	1
Fe2	8b	0.242(13)	0.260(5)	0.15708(26)	0.48(27)	0.25
Bi3	8b	0.249(4)	0.7600(12)	0.10550(7)	1.01(5)	1
Ti1	8b	0.249(14)	0.251(7)	0.0539(4)	0.66(24)	0.75
Ti2	8b	0.242(13)	0.260(5)	0.15708(26)	0.48(27)	0.75
O1	4a	0.24(5)	0.218(14)	0	0.3(15)	1
O2	8b	-0.006(35)	0.013(31)	0.2586(11)	0.5(14)	1
O3	8b	0.332(7)	0.207(10)	0.0942(7)	0.3(16)	1
O4	8b	0.25(4)	0.248(14)	0.1817(7)	0.1(10)	1
O5	8b	0.078(9)	0.071(8)	0.0287(8)	0.6(23)	1
O6	8b	0.535(12)	0.468(11)	0.0541(13)	0.9(13)	1
O7	8b	-0.01(4)	0.00(4)	0.1519(9)	0.1(14)	1
O8	8b	0.628(8)	0.611(7)	0.1541(11)	0.9(20)	1

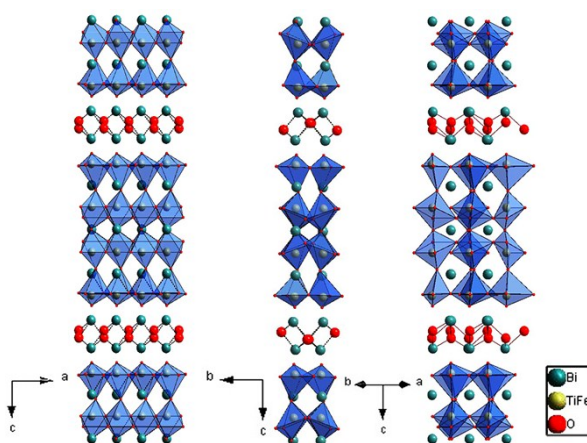


Figure S5. Refined BTF NFs structures viewed along the (a) [010], (b) [100] and (c) [110] directions.

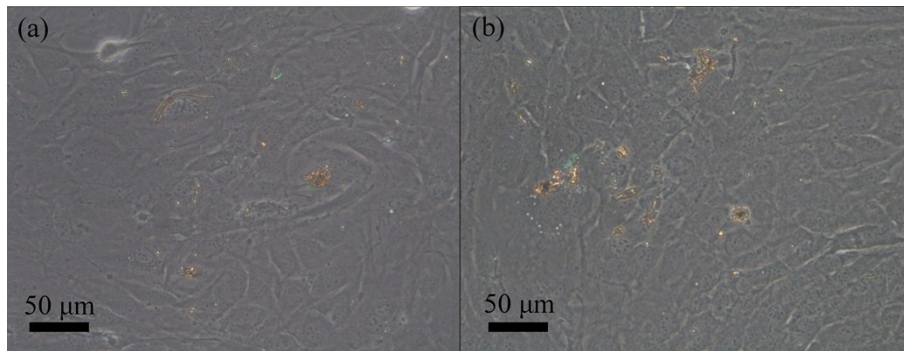


Figure S6. SEM images of the mice pre-osteoblasts MC3T3-E1 grown with BTF NFs for 48 h.

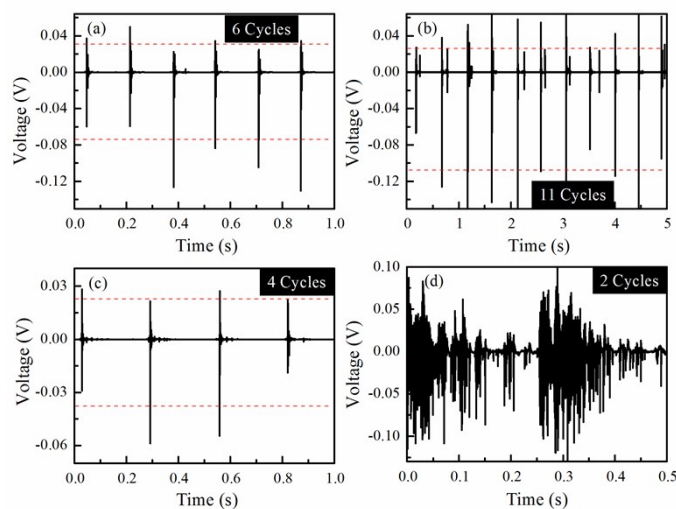


Figure S7. Piezoelectric output voltage generated from the resultant BLTF NPs NG under vertical compressive stress before (a) and after (b) electric poling effect. Output voltage generated from the resultant BTF NFs NG under vertical compressive stress before (c) and after (d) electric poling.

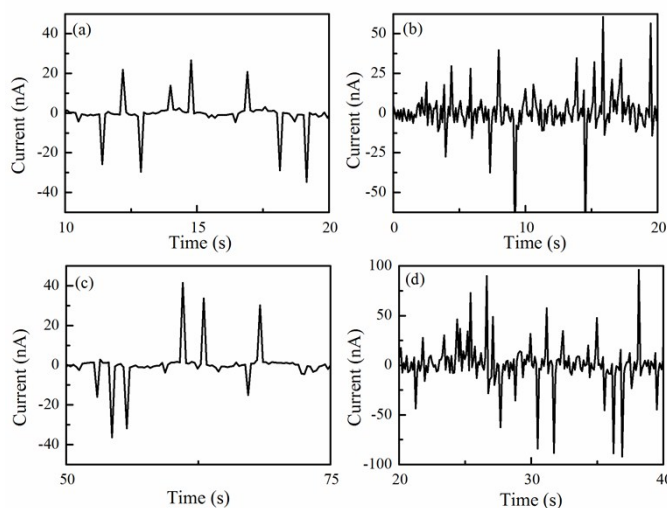


Figure S8. Piezoelectric output current of the resultant BLTF NPs NG under vertical compressive stress before (a) and after (b) electric poling effect. Piezoelectric output current of the resultant BTF NFs NG under vertical compressive stress before (c) and after (d) electric poling.

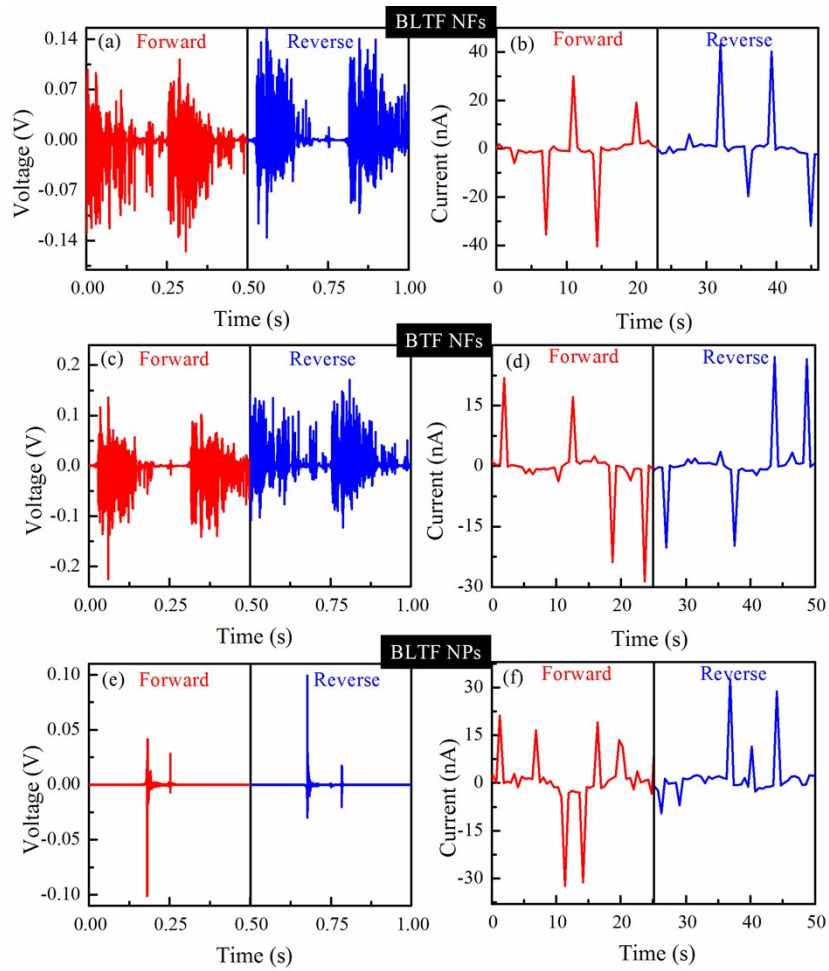


Figure S9. Polarity-switching tests of wool keratin-based biocompatible piezoelectric NGs under vertical compressive stress.

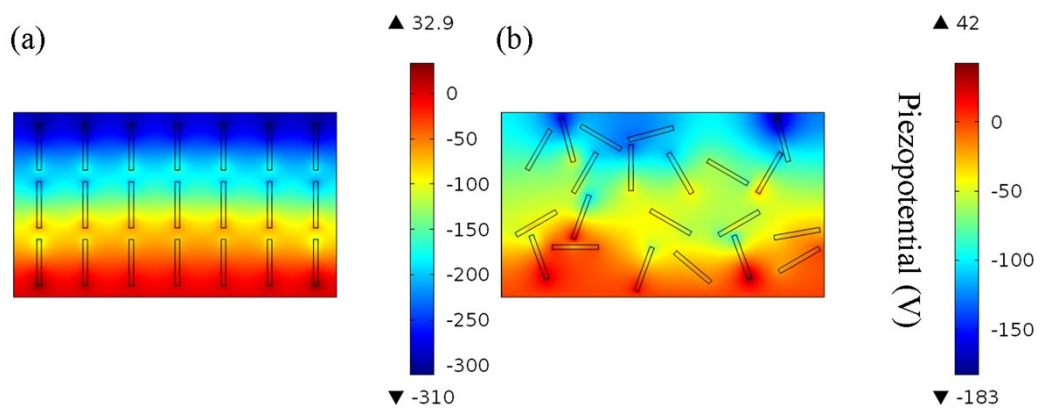


Figure S10. The calculated piezopotential difference between of (a) well aligned and (b) random orientation of NFs in the wool keratin-based matrix.