Supporting Information

Achieving large linear elasticity and high strength in bulk nanocompsite via synergistic effect

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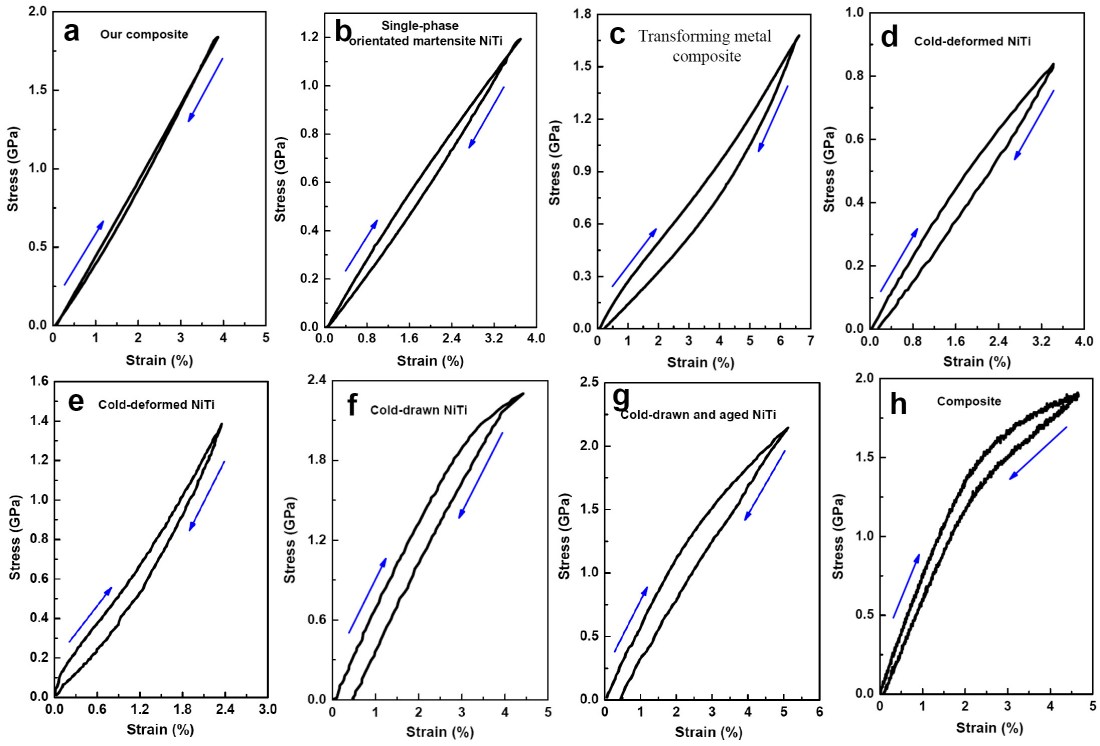

Figure S1 | Comparison of tensile stress-strain curves of our composite and the reported various metallic materials with large linear elasticity. Tensile stress-strain curves of our composite (a), the binary NiTi alloy wire (with oriented martensite) (Figure S2 for its fabrication details) (b), the transforming metal composite[23] (c), the 14% cold-drawn NiTi wire[7] (d), the plastically compressed by 11% NiTi specimen[9] (e), the 70% cold-drawn NiTi wire[10], the 70% cold-drawn and aged for 3.6 ks at 573 K NiTi wire[10] (g), the nanostructured Nb-NiTi composite[11] (h).

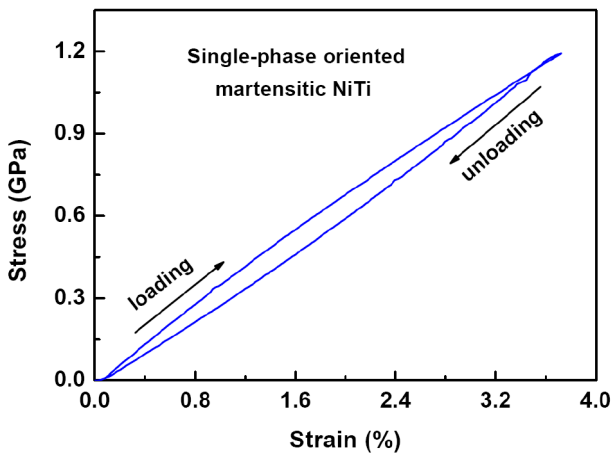

Figure S2 | Tensile stress-strain curve of the binary NiTi alloy wire (with oriented martensite). **Note:** The preparation process of the binary NiTi alloy wire with diameters of 0.5 mm is similar to that of the *in-situ* Nb nanowires - oriented martensite NiTi composite wire (refer to the Experimental Section).

Typical actuator (examples)	Strain (%)	Stress (MPa)	Energy efficiency (%)	Energy density (J/cm2)
Piezoelectric ceramics (PZT)	0.2	110	90	0.1
Electroactive polymer (silicone)	63	3	90	0.75
Megnetostrictive (Terfenol-D)	1	700	80	0.025
Spring steel	<1	1000	>90	<5
Shape memory alloy (NiTi)	5-9	600	<60	30-50
Orientated martensite NiTi	3.7	1200	82	23
Transforming metal composite	6.5	1650	82	52
Our composite (Nb-NiTi)	4	1800	96	36

Table S1 | Comparison of recoverable strain, yield stress, and mechanical energy storage density and storage efficiency between the *in-situ* Nb nanowires - oriented martensite NiTi composite and other various smart materials[11,21].