Highly Aligned Hierarchical Intrafibrillar Mineralization of Collagen
Induced by Periodic Fluid Shear Stress

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**Fig. S1.** High magnification TEM images of ACP under the conditions of control (A), PAA (B) and periodic FSS (C) for 2 h. ACP produces crystal lattice line under the action of periodic FSS (arrows), which is indicative of transition ACP into HA crystal.
**Fig. S2.** SEM characterization to show the surface morphology of mineralized collagen under the condition of control (A), PAA (B) and periodic FSS (C) for 4 (1), 8 (2) and 12 h (3). ACP attaches on the surface of collagen fibers in the control group and small-sized spherical ACP particles appear in the presence of PAA (triangles). Compared with the entangled fiber morphology in these two groups, the mineralized collagen fibers are oriented under the action of periodic FSS (fine arrows).
**Fig. S3.** SEM characterization to show the surface morphology of mineralized collagen after mineralizing for 12 h under the combined action of periodic FSS and different concentrations of PAA. With the appearance of periodic FSS, the mineralized collagen fibers are oriented in a certain direction (fine arrows) and the surface is much smoother than that of the corresponding FSS-free group.