Supporting Information

for

Biomimetic alignment of zinc oxide nanoparticles along a peptide nanofiber

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(1) **Materials and Methods**

(1-1) **HPLC analysis and purification of peptides.** Analytical HPLC and purification of the peptides were performed on a Hitachi ELITE LaChrom system (Hitachi, Japan) equipped with a Cosmosil 5C18-AR-II (4.6 x 150 mm, Nakalai Tesque Inc., Japan) with a linear gradient of acetonitrile/0.1% TFA or an isocratic mobile phase at a flow rate of 1.0 mL/min for analysis, and a Cosmosil 5C18-AR-II (10 x 250 mm) at a flow rate of 3.0 mL/min for preparative purification.

(1-2) **Mass Spectrometry.** Mass spectra were obtained by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOFMS, AXIMA-CFR Plus, Shimadzu, Japan) with 3,5-dimethoxy-4-hydroxycinnamic acid (SA) or α-cyano-4-hydroxycinnamic acid (CHCA) as the matrix.

(1-3) **Time-dependent Zinc Oxide Mineralization.** Method B: A reaction mixture containing matured peptides (50 µM) and Zn(OH)$_2$ (5 mM) was incubated at 25°C and small portions (10 µL each) were taken from the reaction mixture at the time points requested, subsequently applied to the silicon substrates, and dried in vacuo for 1 day for SEM analyses.
(2) Characterization data for RU-003

(2-1) Analytical HPLC profile for RU-003

Figure S1. Analytical HPLC profile for RU-003. Conditions: acetonitrile content: 30% isocratic mobile phase; UV Detection: 220 nm.

(2-2) MALDI-TOF-MS for RU-003

Figure S2. MALDI-TOF-MS for RU-003. Calculated molecular weight: 1081.6; observed molecular weight: 1083.8 [M + H]^+; 1105.8 [M + Na]^+.
Characterization data for RU-027

Analytical HPLC profile for RU-027

Figure S3. Analytical HPLC profile for RU-027. Conditions: acetonitrile content: 23% ($t = 0$ min) → 31% ($t = 30$ min); UV Detection: 220 nm.

MALDI-TOF-MS for RU-027

Figure S4. MALDI-TOF-MS for RU-027. Calculated molecular weight: 2565.0; observed molecular weight 2565.9 [M + H]$^+$. 
Representative SEM images of ZnO crystallization/alignment by the Method B.

Figure S5. Representative SEM images showing the time-dependent manner in the growth of ZnO wires along RU-003 peptide nanofibers by the Method B. (A) 1 h, (B) 3 h, (C) 6 h, (D) 12 h, (E) 24 h, (F) 36 h, (G) 48 h, (H) 60 h, and (I) 72 h after reactions started. Final concentrations: [peptide] = 50 µM and [Zn(OH)$_2$] = 5 mM.