Electronic Supplementary Information

Semi-synthesis of an artificial scandium (III) enzyme with a β-helical bio-nanotube

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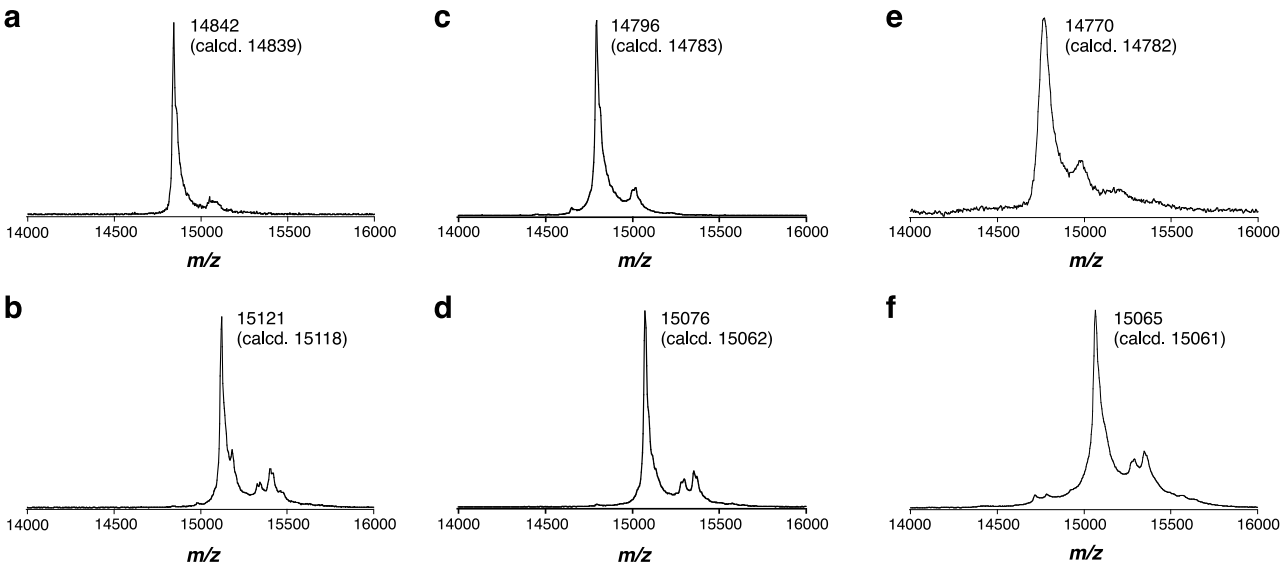

Fig. S1. MALDI-TOF mass spectra of monomer of (a) $[(gp5\beta f\_G18C)_3]_2$, (b) **G18C_bpy**, (c) $[(gp5\beta f\_L47C)_3]_2$, (d) **L47C_bpy**, (e) $[(gp5\beta f\_N51C)_3]_2$, and (f) **N51C_bpy**.

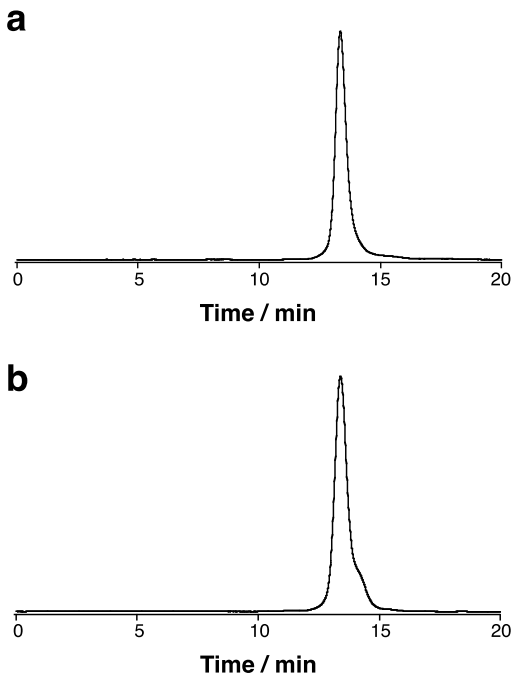

Fig. S2. The elusion profiles of gel permeation chromatography of (a) $[(gp5\beta f\_G18C)_3]_2$ and (b) **G18C_bpy** monitored at 280 nm.

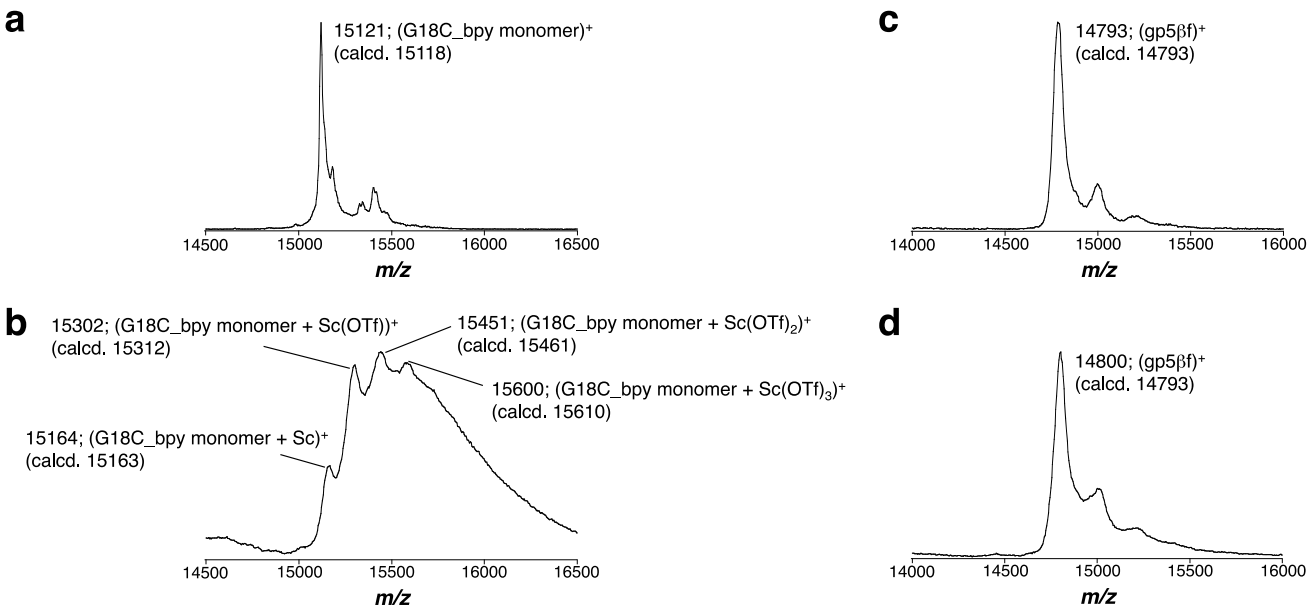

Fig. S3. MALDI-TOF mass spectra of monomer of (a) **G18C_bpy**, (b) **G18C_bpy** with $Sc(OTf)_3$, (c) $[(gp5\beta f)_3]_2$, and (d) $[(gp5\beta f)_3]_2$ with $Sc(OTf)_3$. Conditions of (b) and (d): [2,2'-bipyridine] = 0.20 mM, [protein] = 33 μM, $[Sc(OTf)_3]$ = 2.0 mM in 10 mM MOPS buffer pH 7.5, 10 % acetonitrile, under dark, 40 °C, 48 h.

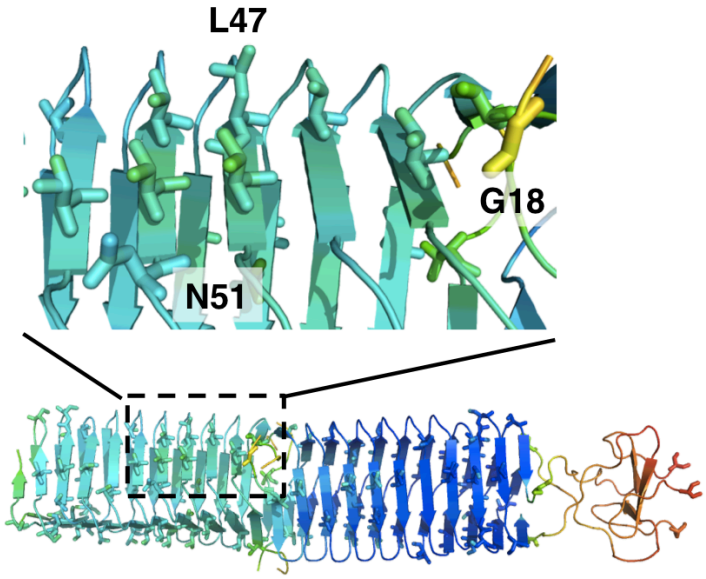

Fig. S4. Crystal structure of $[(gp5\beta f)_3]_2$. B-factor from blue (lowest *b*-factor: 10.5 Å^2) to red (highest *b*-factor: 86.3 Å^2).