Electronic Supplementary Material (ESI) for Molecular Systems Design & Engineering.

Support information for:

Peptide-Templated Biomineralization of Titanium Dioxide toward Improved Light Absorption and Photodegradation Activity

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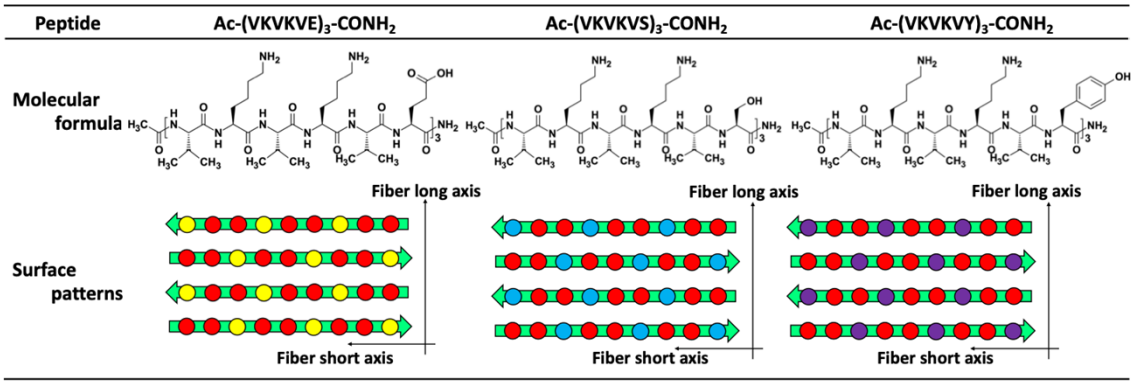

Figure S1. Molecular formula and functional group patterns of the β-sheet peptide templates. Red, yellow, blue, and purple balls indicate the amino, carboxyl, hydroxyl, and tyrosyl groups, respectively.

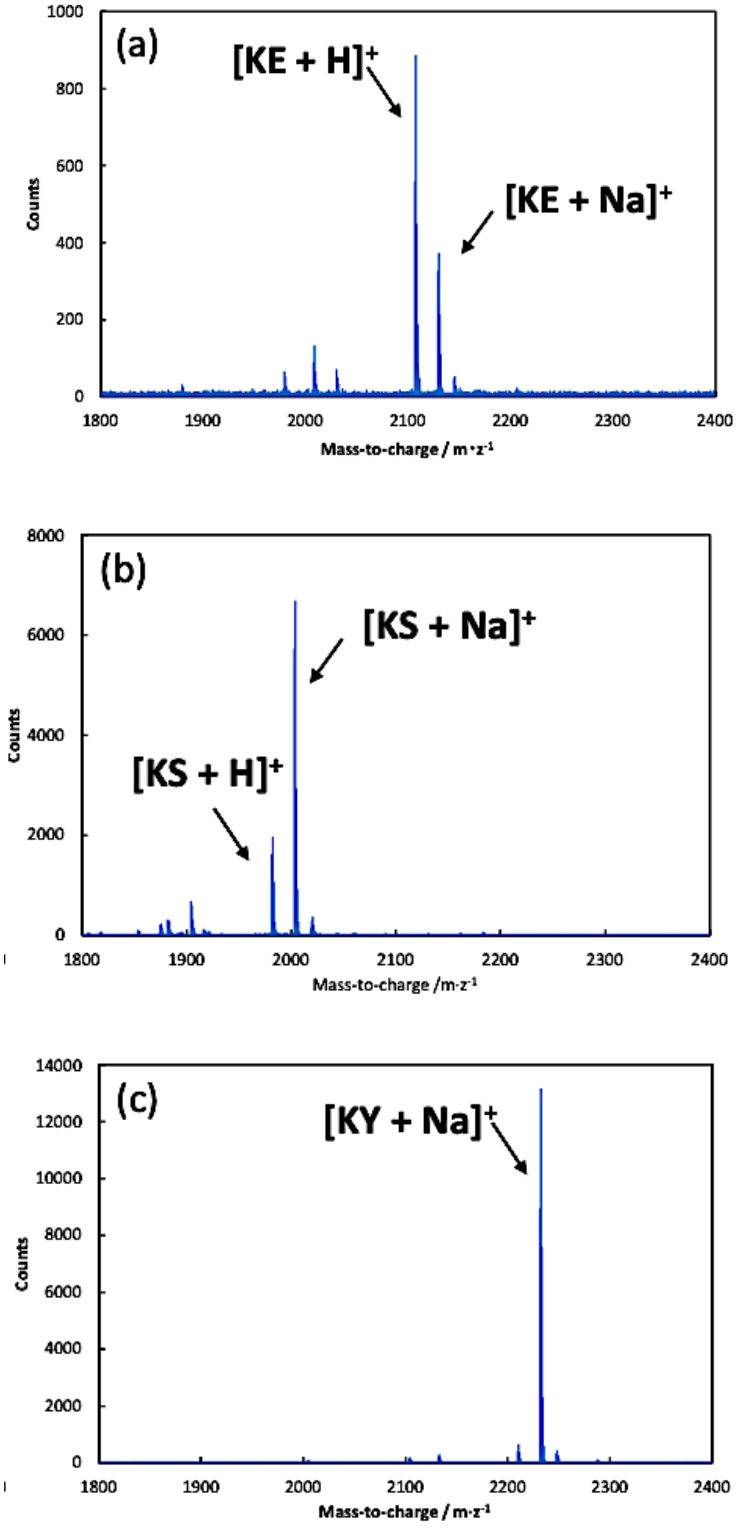

Figure S2. MALDI-TOF-MS spectra of (a) KE, (b) KS, and (c) KY peptides.

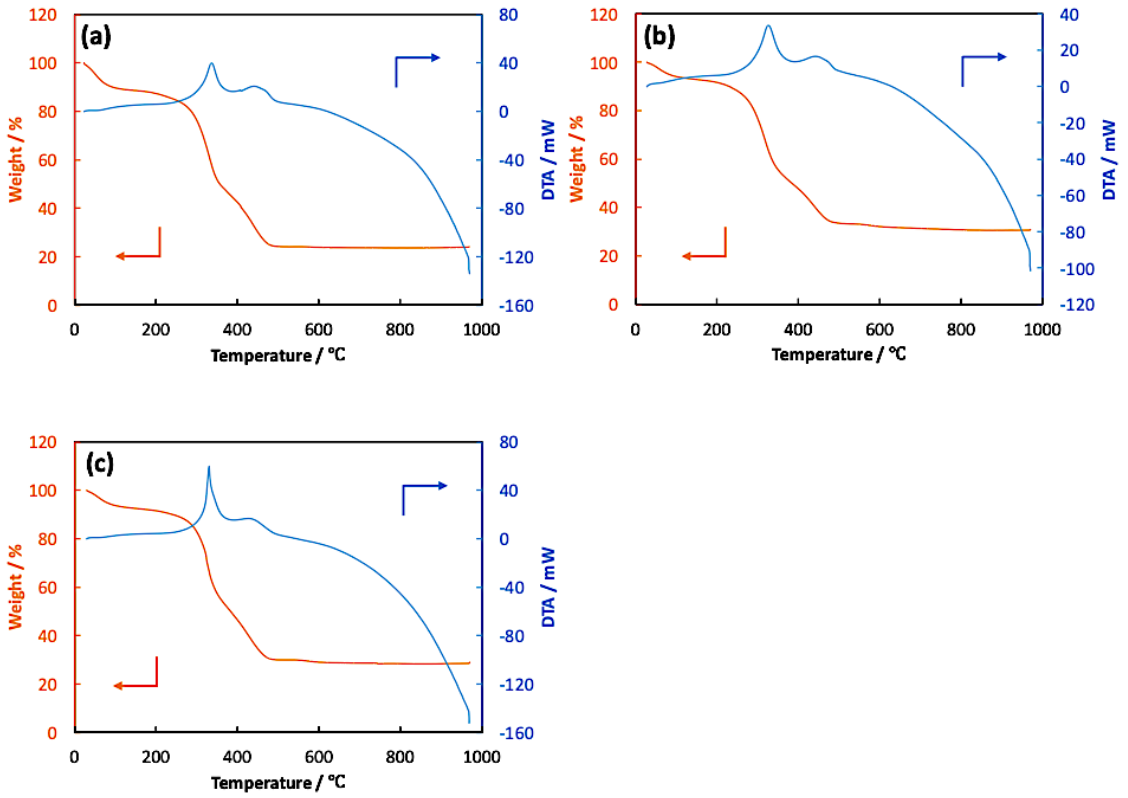

Figure S3. TG-DTA profiles of peptide-TiO_2 hybrids (a: KE-TiO_2, b: KS-TiO_2, and c: KY-TiO_2).

Table S1. Compositions, precipitation amounts, and catalytic activities of peptide-TiO_2 hybrids. The composition and amount of precipitation were estimated using TGA.

Sample	Composition / wt%			Precipitation amount of TiO_2	Catalytic activity of peptide
	H_2O	Peptide	TiO_2	(mg/ peptide solution mL)	(TiO_2 mg/peptide mmol)
KE-TiO_2	12	43	45	0.84 ±0.09	432 ±45
KS-TiO_2	9	43	48	0.67 ±0.12	352 ±63
KY-TiO_2	8	44	48	0.59 ±0.08	307 ±43

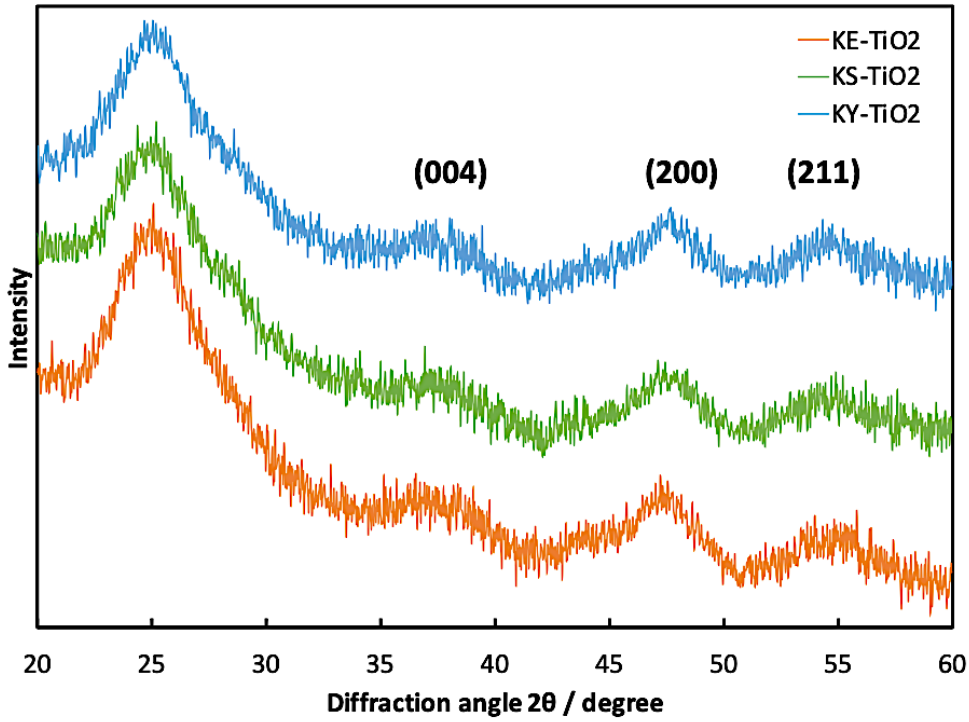

Figure S4. XRD profiles of mineralized peptide-TiO_2 hybrids.

Samples	Bandgap energy / eV
KE-TiO_2	3.42
KS-TiO_2	3.40
KY-TiO_2	2.72

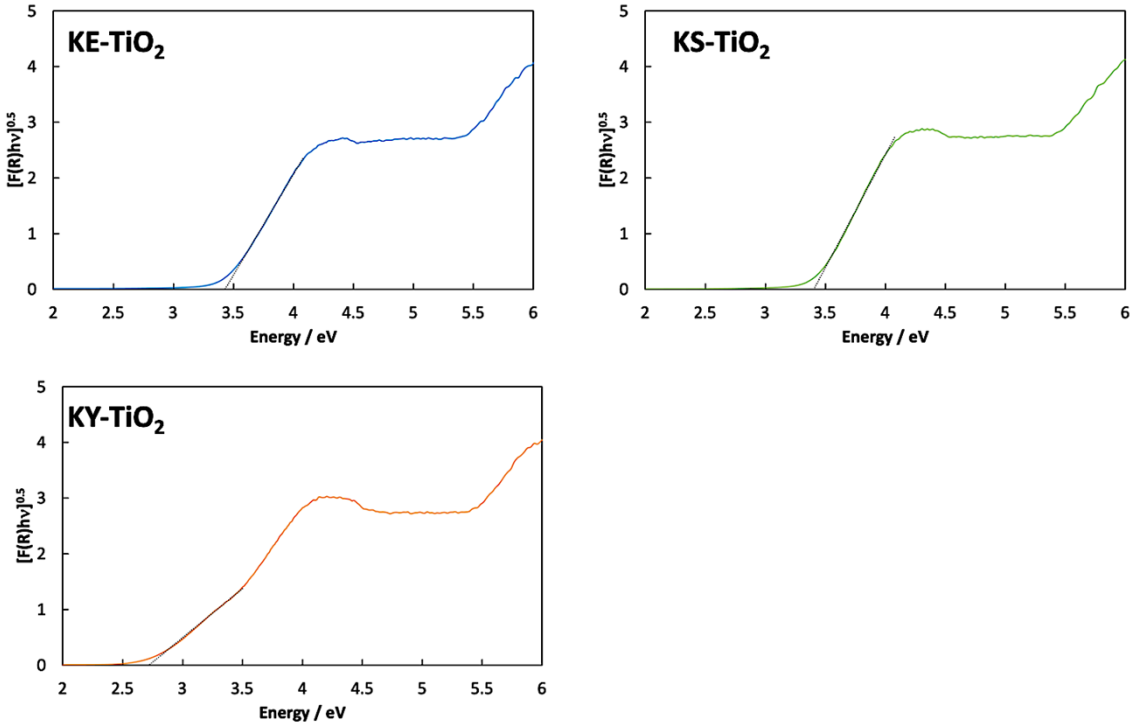

Figure S5. Bandgap energy analysis of the peptide-TiO_2 hybrid materials.

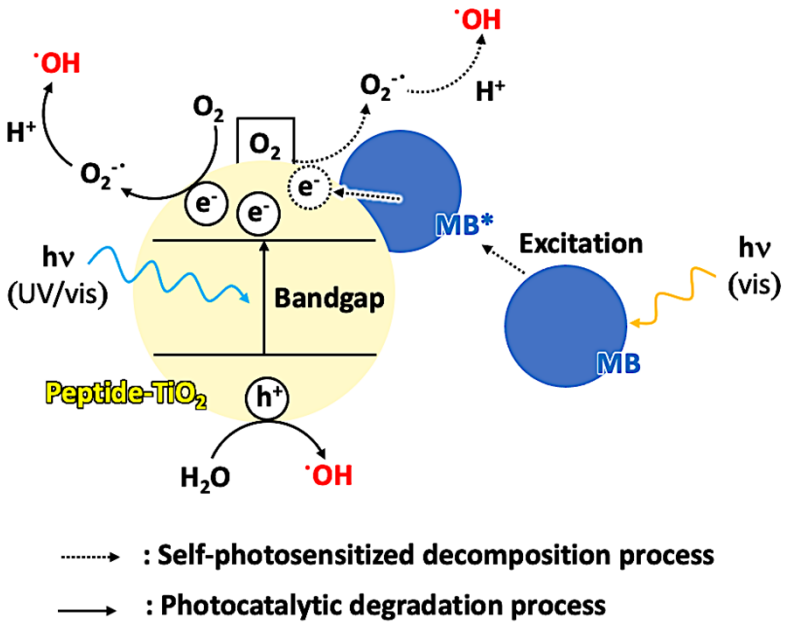

Figure S6. *Photodegradation mechanism of MB with peptide-TiO_2 hybrids under UV/vis lights.*

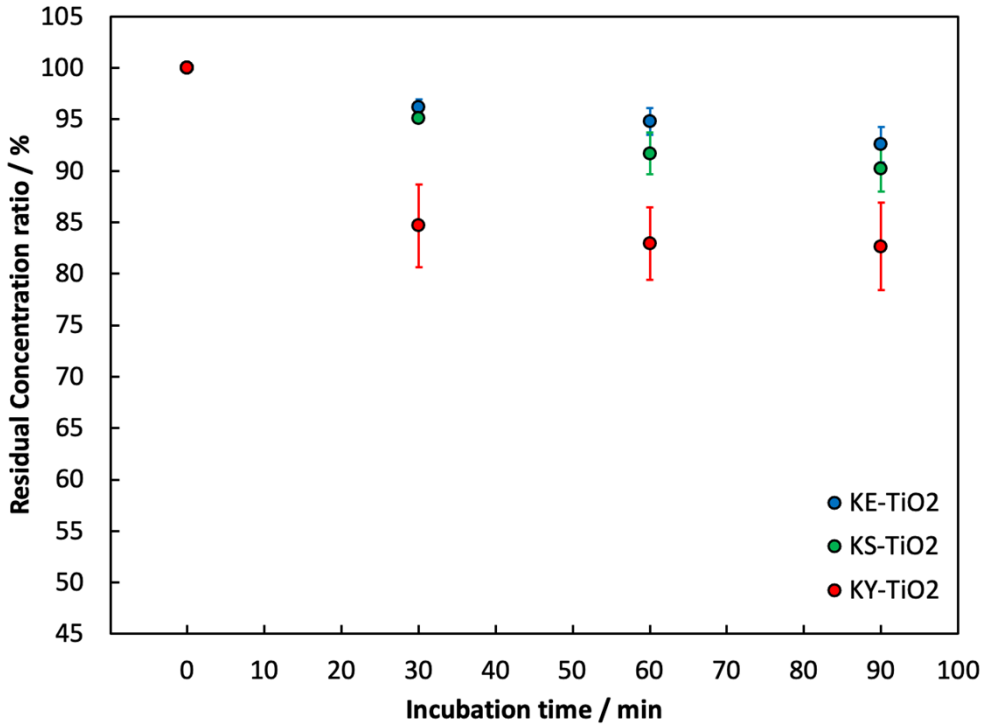

Figure S7. MB absorption profiles on the peptide-TiO_2 surface.

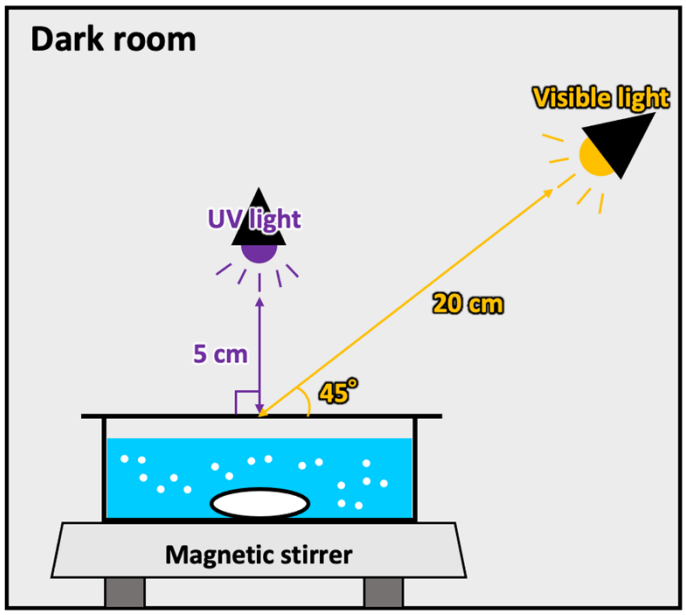

Figure S8. Schematic image of the photodegradation of methylene blue utilizing mineralized peptide-TiO_2 hybrids.