Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.
This journal is © The Royal Society of Chemistry 2018

-Supporting information-

Generation of mucin gel particles with self-degradable and -releasable properties

Yuuka Fukui, Megumi Fukuda and Keiji Fujimoto

Center for Chemical Biology, School of Fundamental Science and Technology, Graduate School of Science and Technology, Keio University, 3-14-1 Hiyoshi, Kohoku-ku, Yokohama, 223-8522, Japan

E-mail: fujimoto@applc.keio.ac.jp

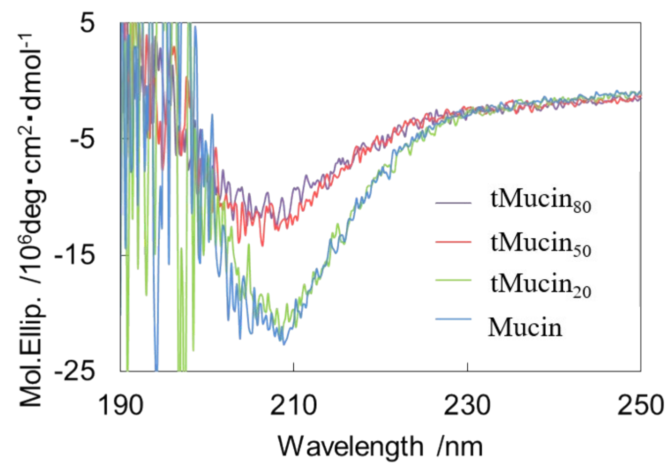

Fig. S1 CD spectra of aqueous solutions of native mucin and trimmed mucin ($tMucin_{20}$, $tMucin_{50}$ and $tMucin_{80}$).

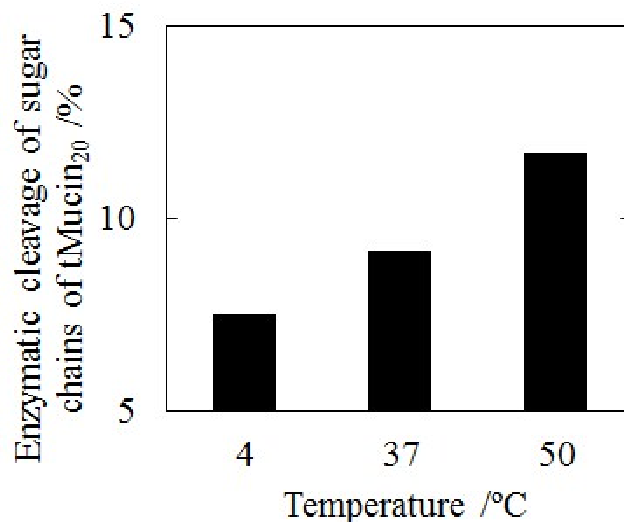

Fig. S2 Temperature-dependent enzymatic degradation of $tMucin_{20}$ by lysozyme in 10 mM $CaCl_2$ aqueous solution at pH 6.0 for 2 days. The percentage of degradation was estimated by the amount of sugar chains released from $tMucin_{20}$ upon enzymatic cleavage according to the procedure described as follows.

At first, 0.55 mL of 6000 ppm lysozyme in 10 mM $CaCl_2$ aqueous solution was added to 11 mL of 4000 ppm mucins in 10 mM $CaCl_2$ aqueous solution. Then, it was incubated for 2 days at 4 ºC, 37 ºC or 50 ºC to allow for enzymatic cleavage of sugar chains. Then, the sample was dialyzed against milli-Q water to isolate cleaved sugar chains from the mucin solution. The amount of cleaved sugar chains was estimated by measuring their sialic acid contents by using a resorcinol method in the same manner as described in 2.2 Trimming of mucin of the experimental section.

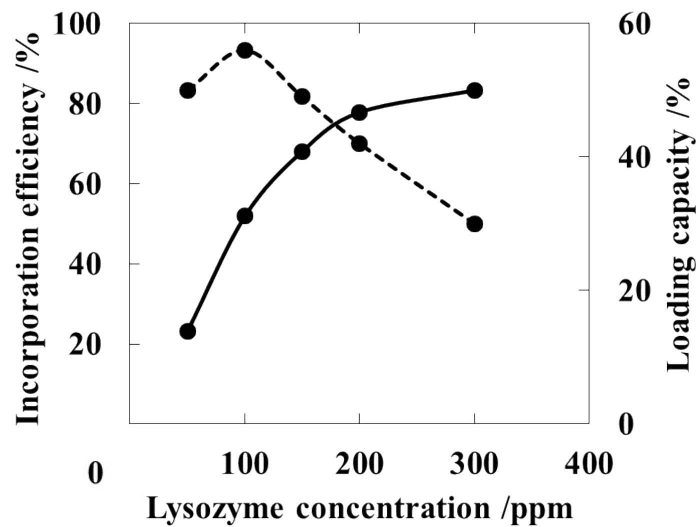

Fig. S3 Incorporation efficiency (broken line) and loading capacity (solid line) of lysozyme in tMucin$_{20}$ particles at different feed concentrations.

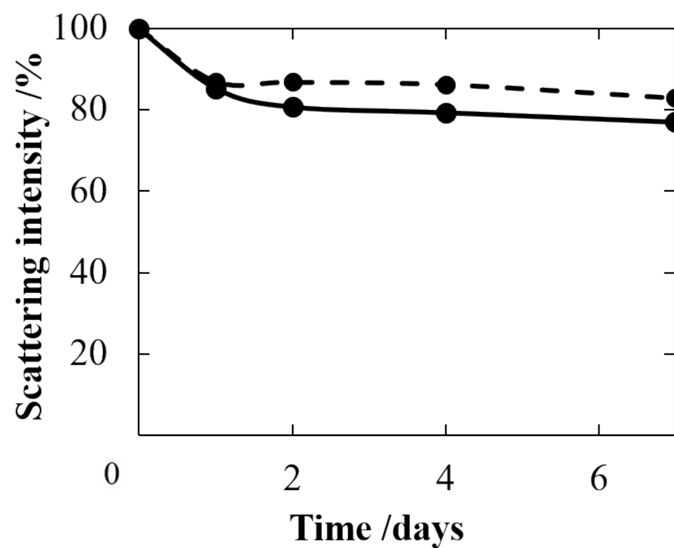

Fig. S4 Time courses of the scattering intensity of tMucin$_{20}$ particles suspended in 10 mM NaCl aqueous solution (broken line) and 10 mM $CaCl_2$ aqueous solution (solid line) at 50ºC.

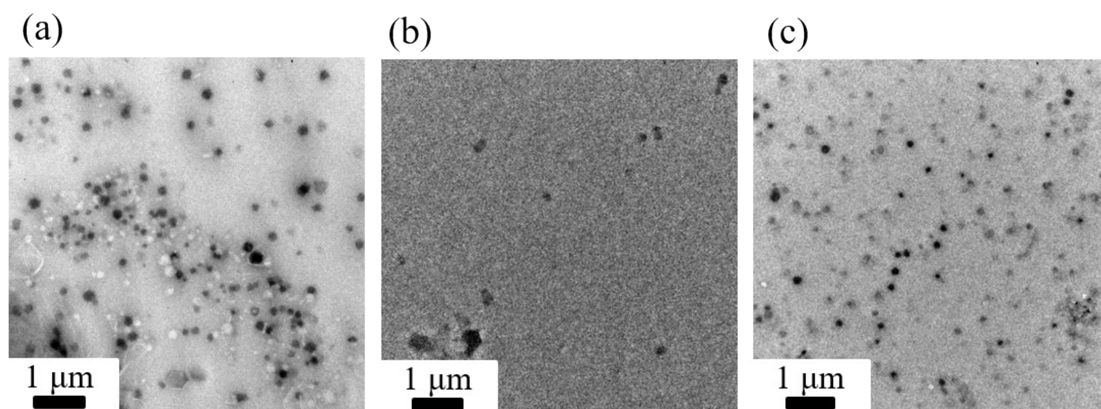

Fig. S5 TEM images of lysozyme-incorporated $tMucin_{20}$ particles before (a) and after (b) 7 days-incubation at 50ºC in 10 mM $CaCl_2$ aqueous solution. TEM images of $tMucin_{20}$ particles without lysozyme after 7 days-incubation at 50ºC in 10 mM $CaCl_2$ aqueous solution (c).