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Electronic Supporting Information for

All-water synthesis of keratin micro-nano particles with tunable mucoadhesive properties for drug delivery

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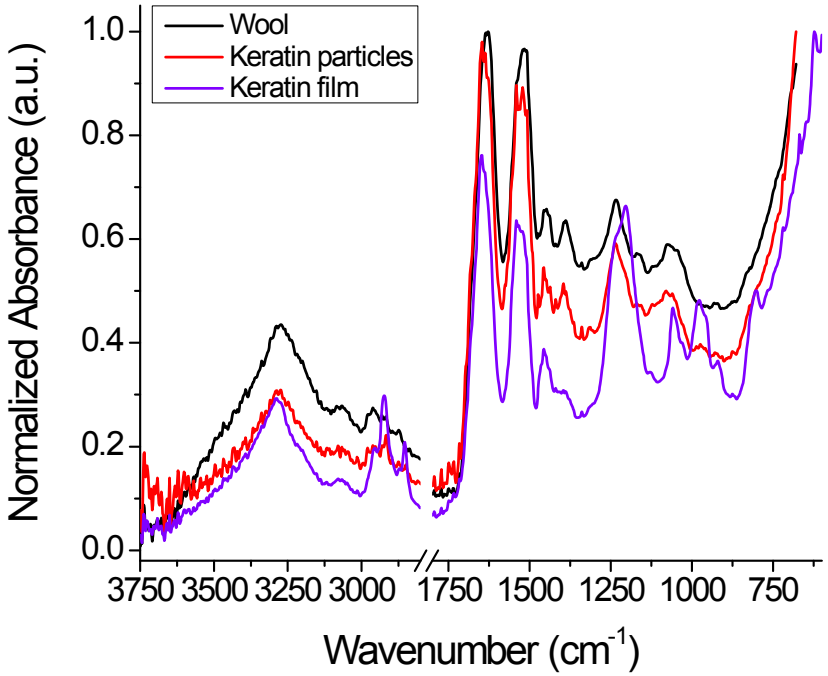

Figure S1: FTIR spectra of the wool from which the keratin was extracted, the synthesized keratin particles and a keratin film obtained by casting of the keratin solution.

Model drug	Molecular Weight (Da)	Charge at pH 6.5	LogP
Albumin-FITC	70000	Slightly negative	1.18
Curcumin	368.38	Neutral	2.56
Carminic Red	492.389	Negative	1.53
Eosin	647.89	Negative	-0.18
Methylene Blue	319.85	Positive	-0.9
Au NP	n.d.	n.d.	n.d.

Table S1: molecular weight, charge at pH 6.5 and partition coefficient (logP) for the different model drugs.

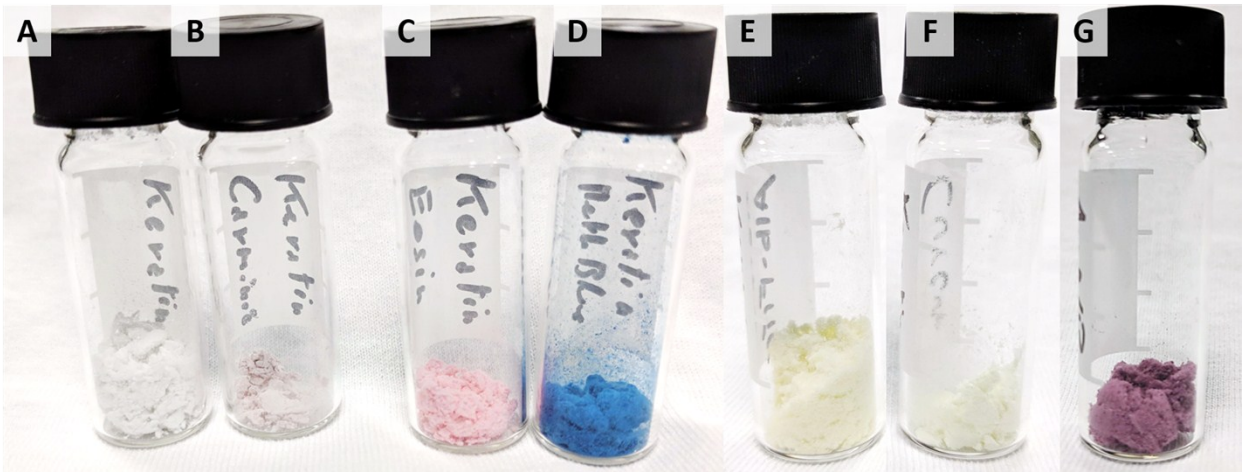

Figure S2: Lyophilized keratin particles. A) unloaded; B) loaded with carminic acid; C) loaded with eosin; D) loaded with methylene blue; E) loaded with albumin-FITC; F) loaded with curcumin; G) loaded with gold nanoparticles.

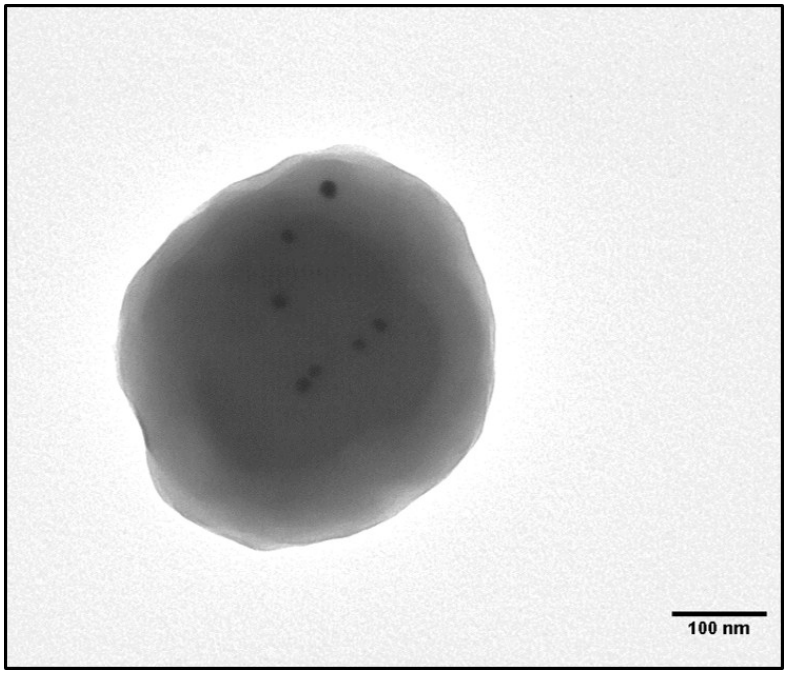

Figure S3: TEM picture showing gold nanoparticles successfully encapsulated inside a keratin particle.

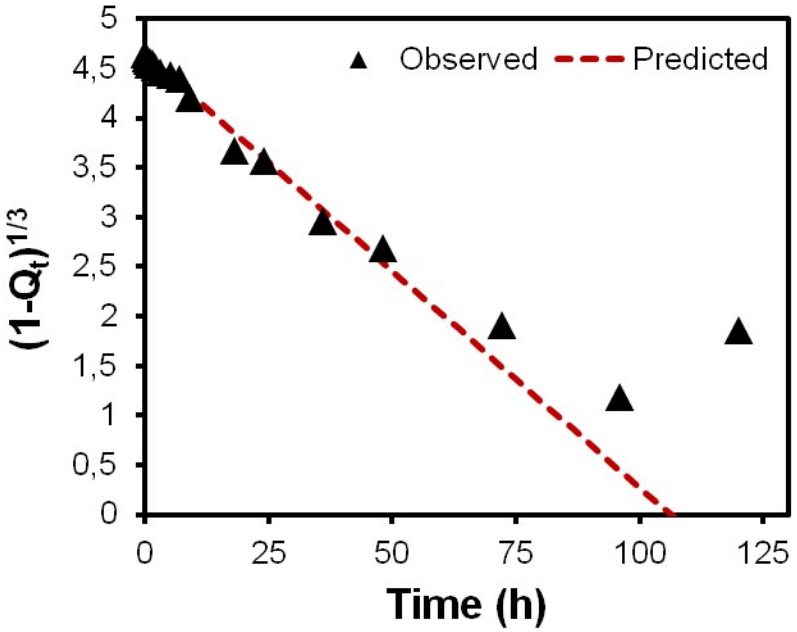

Figure S4: Hixson-Crowell fitting of the release data of Albumin FITC from the keratin particles.

Fit results are: K_{HC}=0.009, r^2 = 0.9919.