

Dialdehyde starch nanocrystals as a novel cross-linker for biomaterials able to interaction with human serum proteins

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Figure S1. Images of all obtained samples.

Table S1. The average contact angle for glycerin and diiodomethane for films of chitosan (CS), gelatin (Gel), and chitosan-gelatin (CS-Gel) cross-linked by 5%, 10% and 15% adding of cross-linker (NDAS).

Sample	Average Contact Angle [θ , $^{\circ}$]	
	Measuring Liquid	
	Glycerin	Diiodomethane
CS	82.0	56.0
CS-5%NDAS	79.4	55.7
CS-10%NDAS	76.6	54.6
CS-15%NDAS	76.1	49.0
Gel	76.9	44.8
Gel-5%NDAS	72.7	46.9
Gel-10%NDAS	69.4	49.0
CS-15%DAS	72.5	45.3
CS-Gel	71.6	46.8
CS-Gel-5%NDAS	75.2	49.7
CS-Gel-10%NDAS	72.7	48.0
CS-15%Glu	74.4	46.2

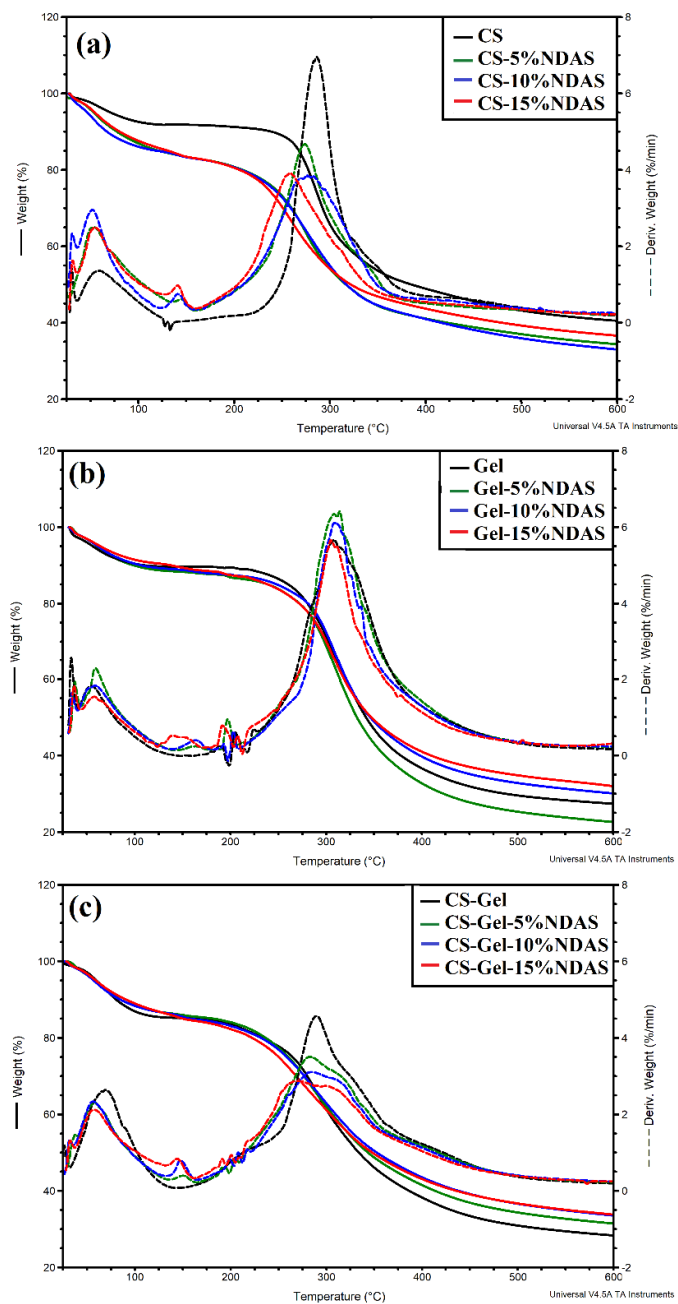


Figure S2. The TGA-DTG curves of (a) chitosan, (b) gelatin, and (c) chitosan-gelatin (1:1) cross-linked with 5%, 10%, and 15% of NDAS.

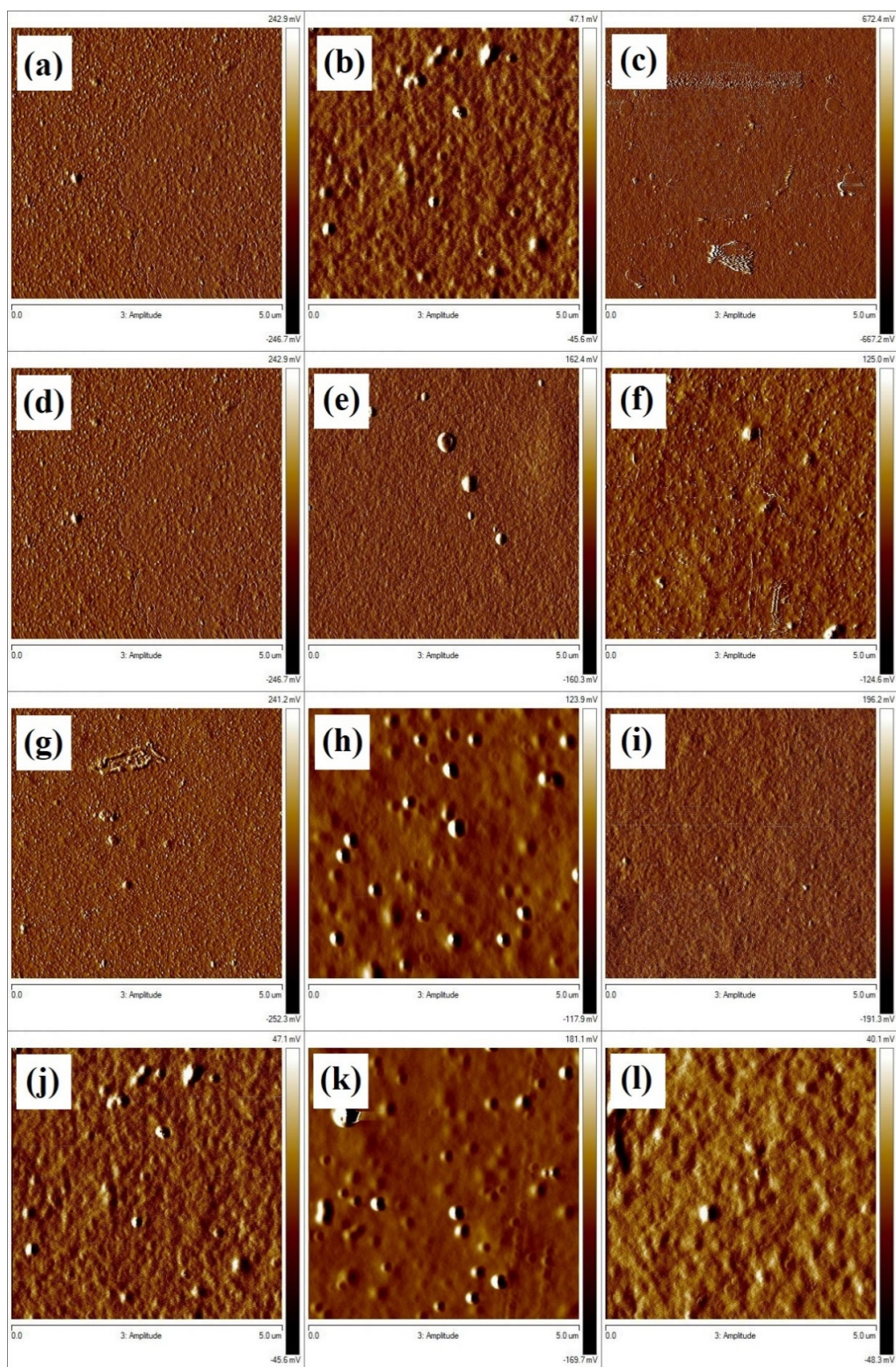


Figure S3. AFM images in 2D scale of (a) chitosan films cross-linked by (d) 5% NDAS, (g) 10% NDAS, and (j) 15% NDAS, (b) gelatin film cross-linked by (e) 5% NDAS, (h) 10% NDAS, and (k) 15% NDAS, and (c) chitosan-gelatin films cross-linked by (f) 5% NDAS, (i) 10% NDAS, and (l) 15% NDAS.

Table S2. Amount of protein bound on the surface of biopolymers in mg of protein per 1 cm² of biopolymer film in the full range of incubation timescales.

Sample	Incubation time [h]													
	1h		2h		3h		4h		5h		6h		24h	
	Amount of adsorbed serum protein [mg/cm ²]													
	HSA	AGP	HSA	AGP	HSA	AGP	HSA	AGP	HSA	AGP	HSA	AGP	HSA	AGP
CS	0.067	0.068	0.067	0.070	0.072	0.064	0.072	0.071	0.073	0.080	0.073	0.077	0.084	0.083
CS-5%NDAS	0.116	0.073	0.131	0.084	0.144	0.082	0.145	0.090	0.147	0.080	0.148	0.094	0.174	0.108
CS-10%NDAS	0.093	0.081	0.106	0.086	0.119	0.085	0.121	0.091	0.124	0.090	0.126	0.092	0.141	0.094
CS-15%NDAS	0.159	0.069	0.167	0.081	0.174	0.081	0.173	0.087	0.174	0.080	0.175	0.086	0.189	0.089
Gel	0.094	0.103	0.112	0.111	0.126	0.110	0.122	0.128	0.123	0.121	0.123	0.112	0.111	0.121
Gel-5%NDAS	0.039	0.117	0.042	0.129	0.044	0.130	0.045	0.140	0.045	0.148	0.047	0.147	0.051	0.170
Gel-10%NDAS	0.036	0.136	0.037	0.144	0.039	0.141	0.041	0.149	0.044	0.152	0.047	0.151	0.049	0.169
Gel-15%NDAS	0.046	0.255	0.065	0.256	0.069	0.256	0.071	0.258	0.072	0.259	0.072	0.258	0.074	0.266
CS-Gel	0.031	0.066	0.033	0.073	0.044	0.064	0.045	0.068	0.048	0.080	0.054	0.077	0.058	0.080
CS-Gel-5%NDAS	0.042	0.073	0.047	0.074	0.049	0.072	0.053	0.083	0.063	0.080	0.068	0.084	0.073	0.083
CS-Gel-10%NDAS	0.039	0.065	0.040	0.067	0.041	0.070	0.044	0.077	0.047	0.073	0.051	0.076	0.051	0.077
CS-Gel-15%NDAS	0.052	0.079	0.053	0.080	0.058	0.084	0.058	0.094	0.064	0.086	0.064	0.094	0.064	0.094

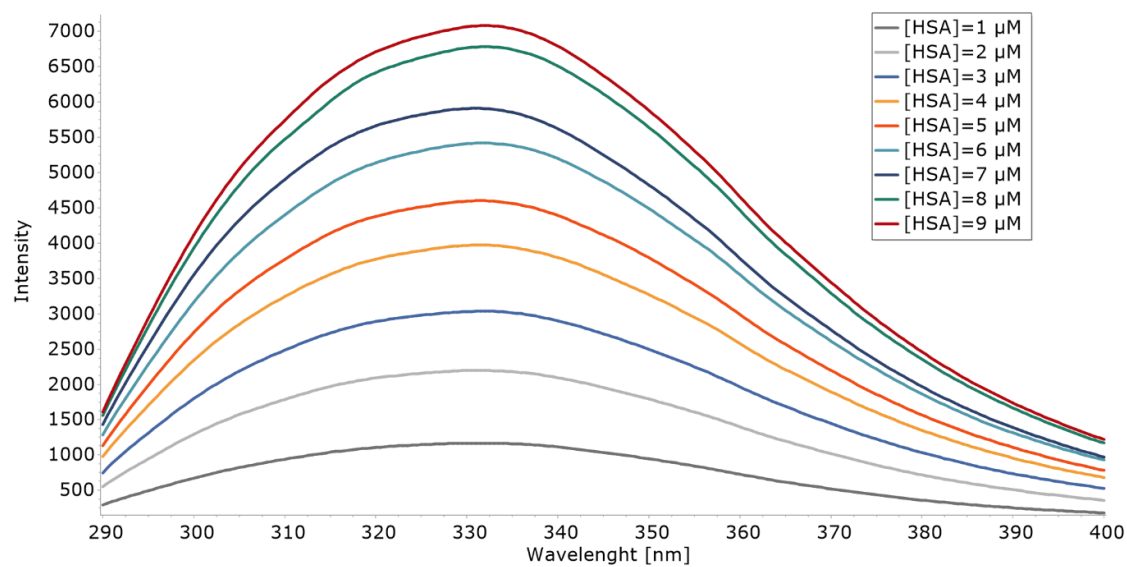


Figure S4. Emission fluorescence spectra of human serum albumin with increasing concentrations.

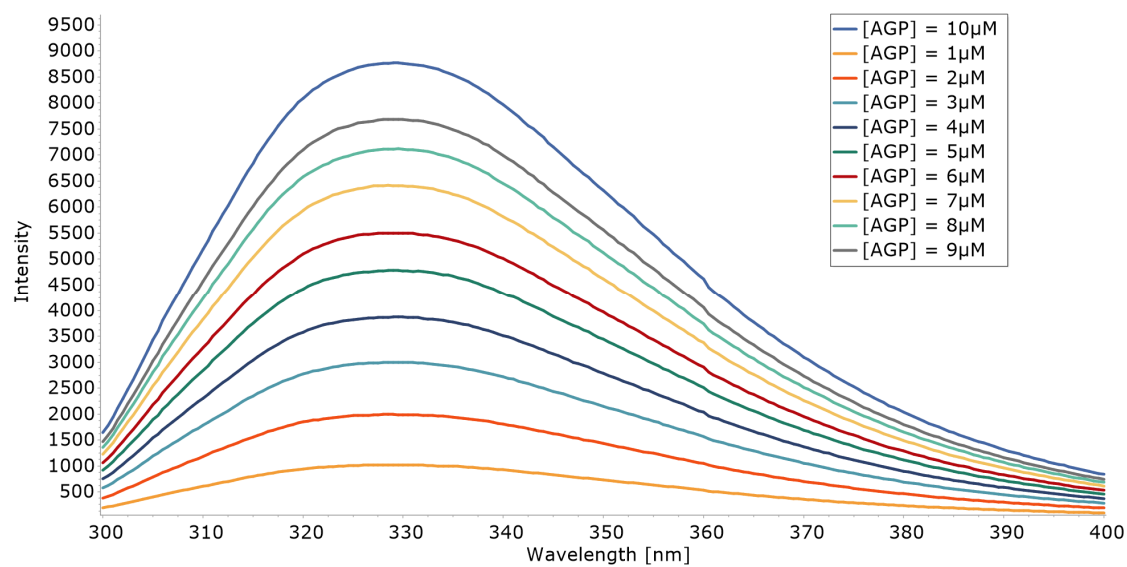


Figure S5. Emission fluorescence spectra of $\alpha 1$ -acid glycoprotein with increasing concentrations.