Redox-responsive hyaluronic acid-based nanogels for the topical delivery of visual chromophore to retinal photoreceptors

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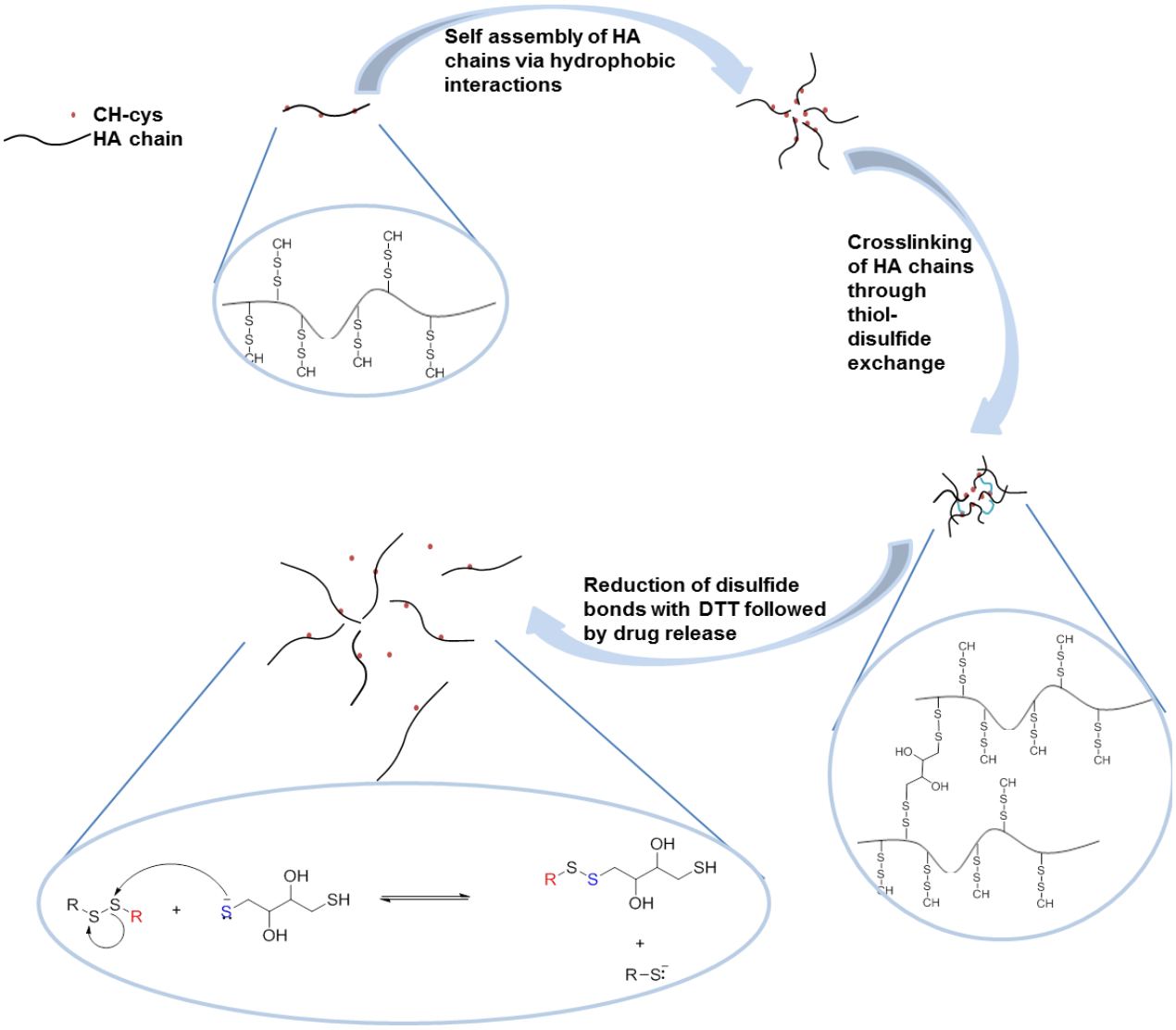
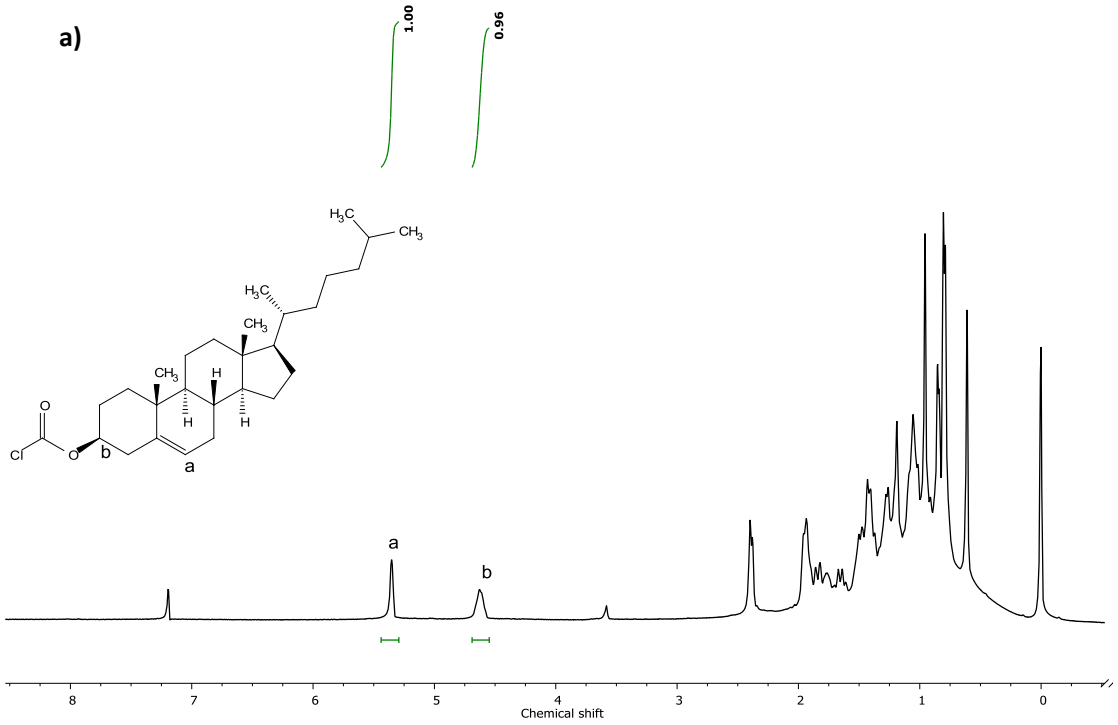
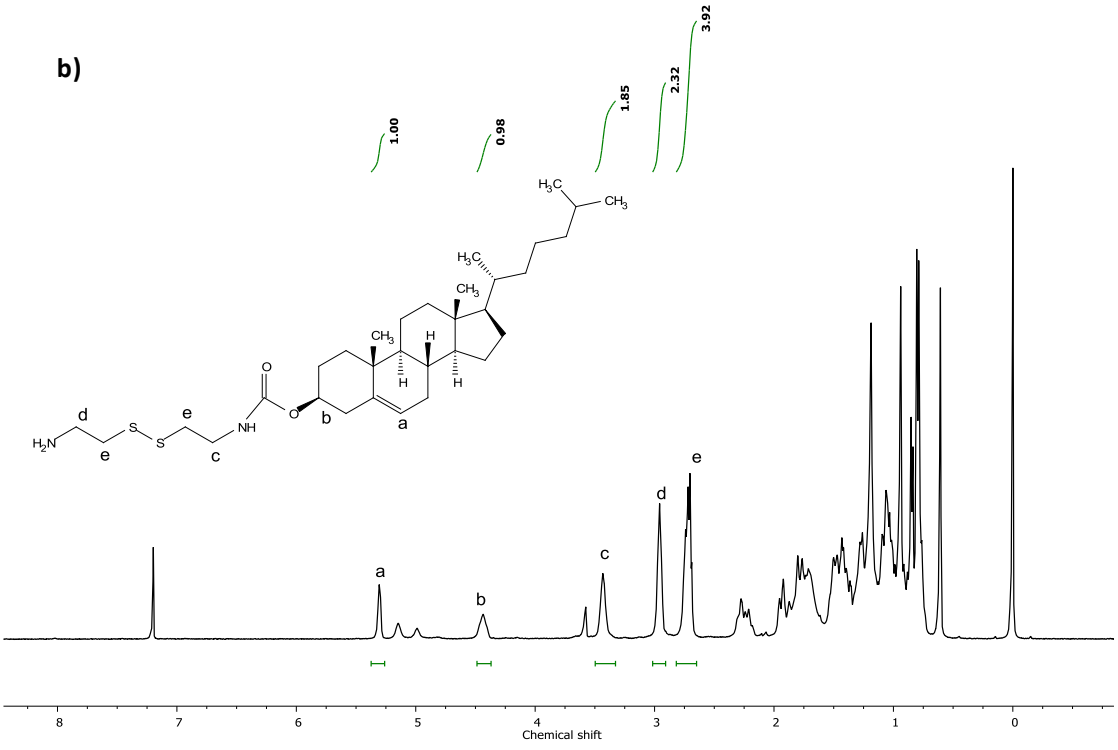


Scheme S1. Schematic diagram illustrating the working mechanism of HA-cys-CH self-assembly, covalent crosslinking, and decrosslinking.

Characterization

^{1}H NMR spectra were recorded by Varian Unity Inova spectrometer (400 MHz, Agilent Technologies, Santa Clara, CA, USA), using $CDCl_3$ as a solvent. The size and zeta potential of the prepared nanogels at various stages were analyzed by Dynamic light scattering (DLS) using a Malvern Zetasizer Nano ZS (Malvern Instruments) equipped with a backscattering detector (173°). For both measurements, samples were dispersed in DI water, sonicated, and filtered through a prerinsed 0.22 μm filter. Nanogels morphology was examined using a JEOL JEM-2100F Field-Emission Scanning Transmission Electron Microscope.


a)
1.00
0.96
a
b
Chemical shift


b)
1.00
0.98
1.85
2.32
3.92
a
b
c
d
e
Chemical shift

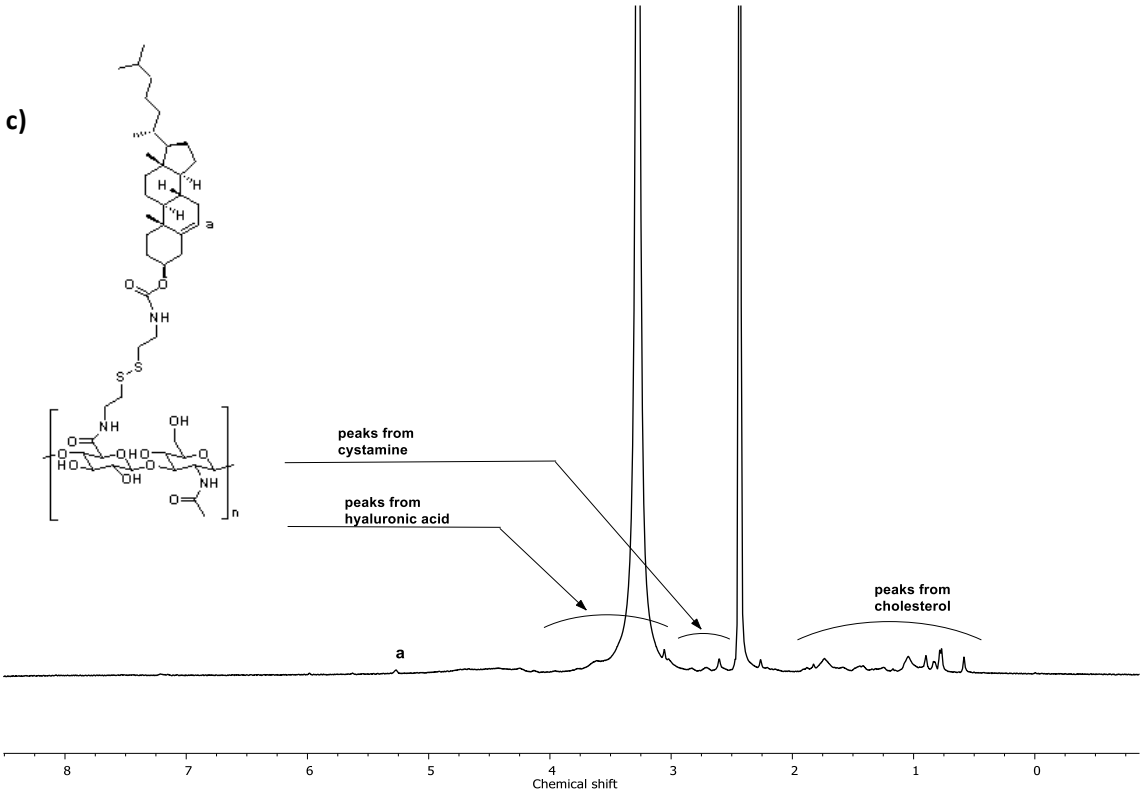


Figure S1. [1]HNMR spectra of a) cholesteryl chloroformate, b) cystamine-modified cholesterol (HA-cys), and c) hyaluronic acid-colesterol conjugate (HA-cys-CH)

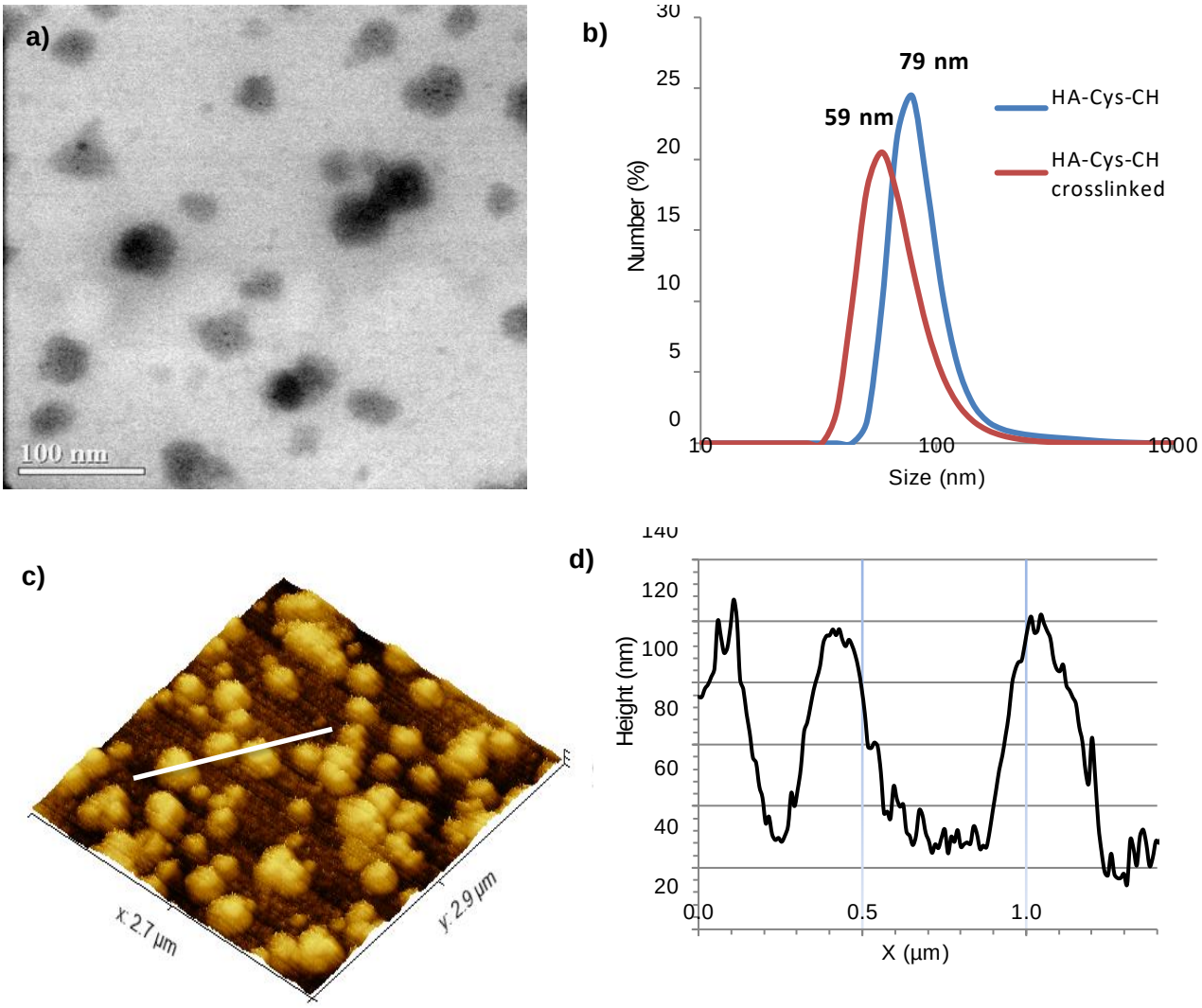


Figure S2. Size and morphology of HA-cys-CH as characterized by: a) Bright field TEM image, b) DLS before and after crosslinking, c) 3D AFM height image, and d) Height profile extracted from the AFM image.