

## SUPPORTING INFORMATION

# Atomic Force Microscopy Probing of Receptor-Nanoparticle Interactions for Riboflavin Receptor Targeted Gold-Dendrimer Nanocomposites

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Figure S1. (A) HPLC traces of G5(LA)<sub>10</sub>(RF)<sub>n</sub> conjugates (**3**: n = 0; **4**: n = 5). Each trace shows no detectable level of small molecule impurities (polymer purity >95%); (B) Size Exclusion/Gel Permeation Chromatographic (SE/GPC) traces of **3–4**.

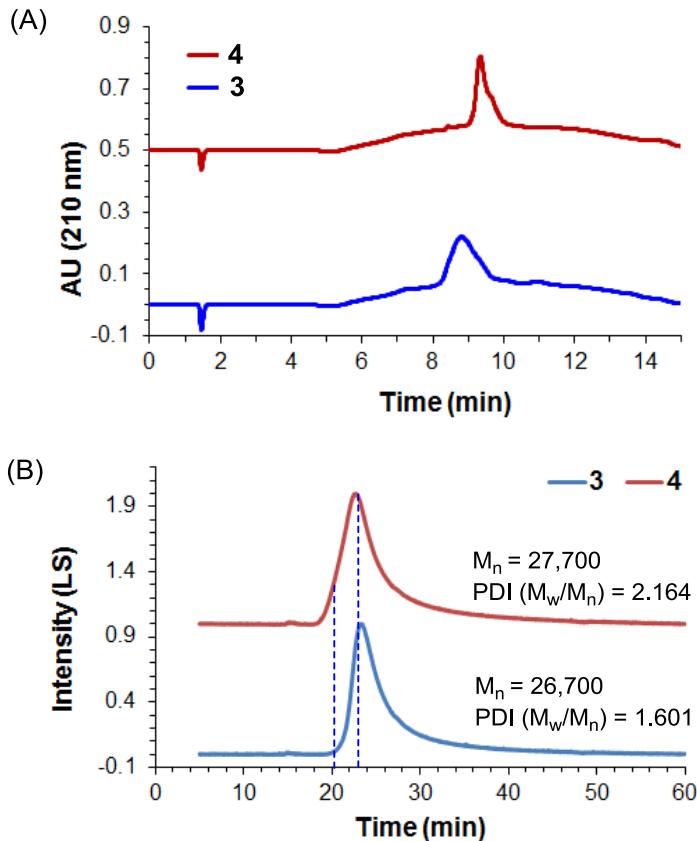


Figure S2. UV-vis spectra of **4** G5(LA)<sub>10</sub>(RF)<sub>5</sub> conjugate, each measured in PBS (pH 7.4).

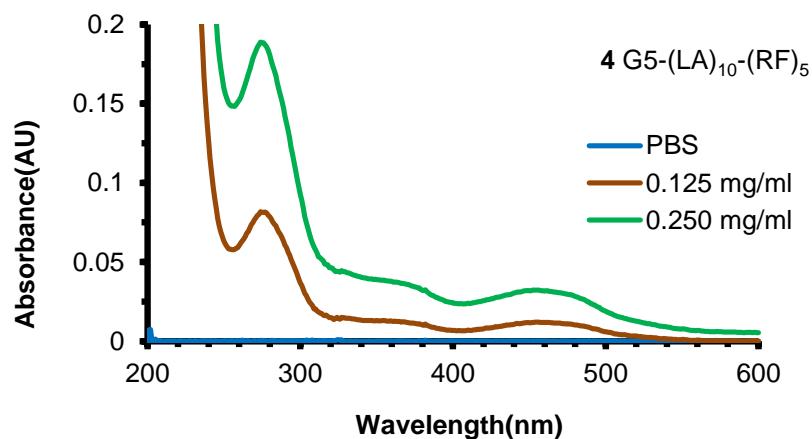


Figure S3.  $^1\text{H}$  NMR spectra of lipoic acid (LA; A) and conjugates **3–4** G5(LA)<sub>10</sub>(RF)<sub>n</sub> (n = 0, 5; B,C), each measured in CD<sub>3</sub>OD or D<sub>2</sub>O (500 MHz). Note that those signals for amide (NH) protons of the dendrimer do not show up due to the rapid deuterium-hydrogen exchange reaction.

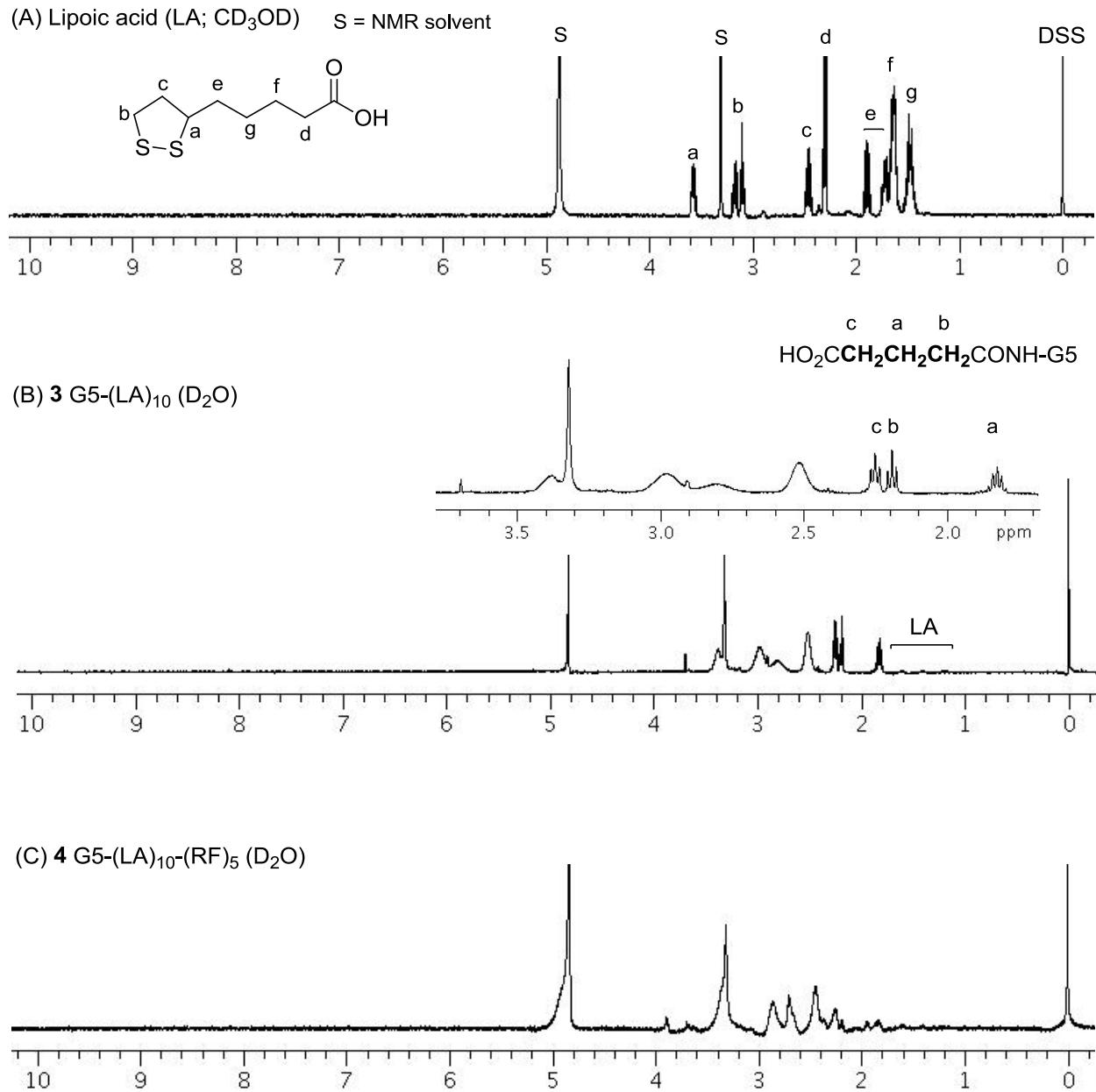


Figure S4. Hydrodynamic size distribution (Z-average diameter, nm) of gold nanoparticles (AuNP) measured by dynamic light scattering at 25°C on a Zetasizer Nano ZS (Malvern).

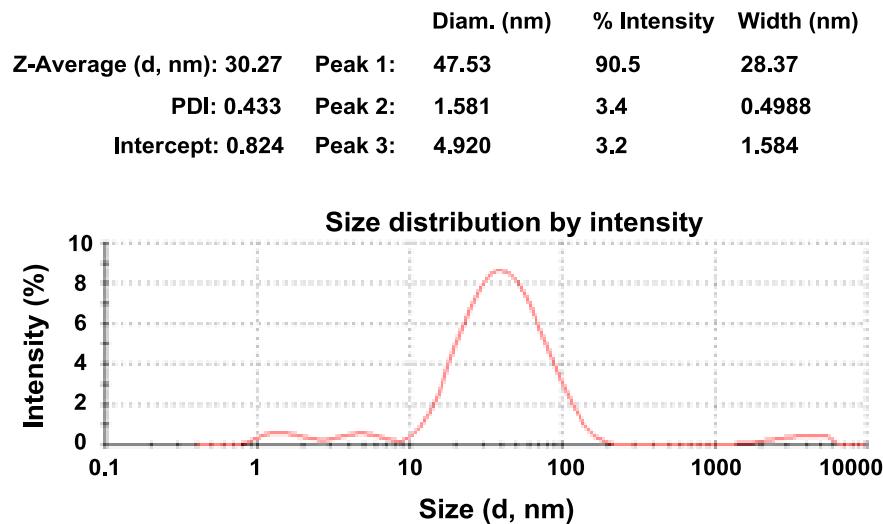


Figure S5. Stochastic synthesis of **4** G5(LA)<sub>10</sub>(RF)<sub>n</sub> that results in theoretical Poissonian distribution (% population) of dendrimer conjugates with a mean valency of five RF (n = 5).

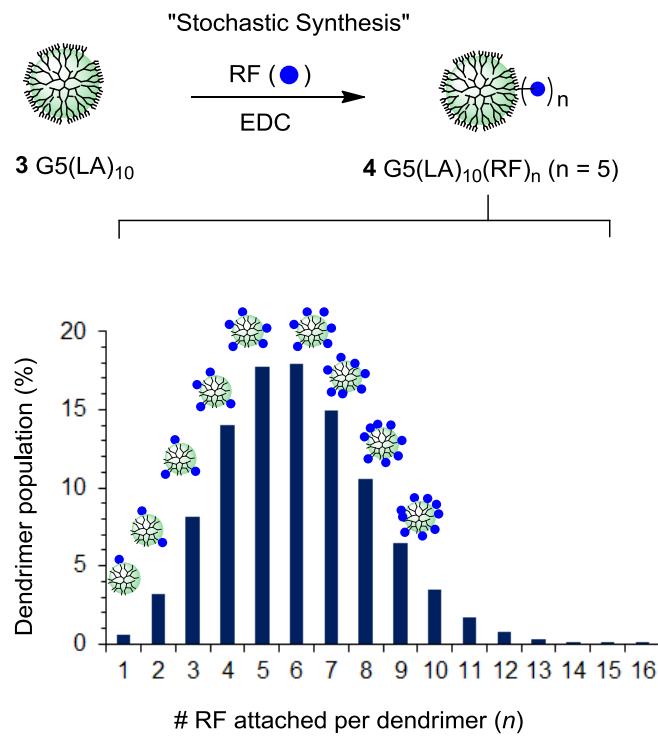


Figure S6. AFM images of various surface functionalization methods and immobilization of 2 nM AuNP on A) bare mica surface (z-range 0-5 nm) B) MgCl<sub>2</sub> treated surface (z-range 0-5 nm), and C) 0.01% APTES-mica surface (z-range 0-25 nm). All AFM images were obtained in PBS buffer (pH 7.4).

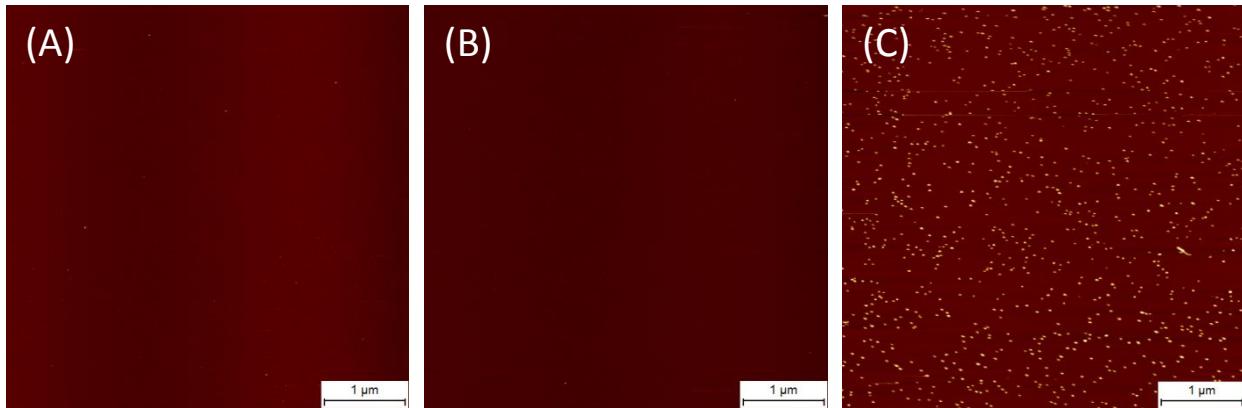


Table S1. Binomial proportion analysis

Nanoparticle Height	Dendrimer <b>4</b> -AuNP (%)	Dendrimer <b>4</b> -AuNP + RfBP (%)	p value <sup>a</sup>
20-40 nm Range	16.96	28.92	<0.05
Nanoparticle Height	Dendrimer <b>4</b> -AuNP + RfBP (%)	Dendrimer <b>4</b> -AuNP + RfBP + RF (%)	p value <sup>b</sup>
20-40 nm Range	28.92	17.44	<0.05
Nanoparticle Height	Dendrimer <b>4</b> -AuNP (%)	Dendrimer <b>4</b> -AuNP + RfBP + RF (%)	p value <sup>c</sup>
20-40 nm Range	16.96	17.44	0.448

Comparison of the proportion of the population within the 20-40 nm height range between dendrimer **4**.AuNP and dendrimer **4**.AuNP + RfBP (a); dendrimer **4**.AuNP + RfBP and dendrimer **4**.AuNP + RfBP + RF (b); dendrimer **4**.AuNP and dendrimer **4**.AuNP + RfBP + RF (c)

Figure S7. Binomial comparison of the proportion of the population

