Supporting Information

Figures S1 (16 nm) and S2 (76 nm) show the size distribution and corresponding absorption spectra of the gold nanoparticles (AuNPs) deposited in polydimethylsiloxane (PDMS) films for the current work. Figure S3 shows a schematic of the thermometric setup used to conduct laser irradiation trials for the AuNP-containing films. Figure S4 shows the reduced AuNP films (Film II) in order of decreasing Au content. These films contained randomly sized AuNPs where a size distribution could not be obtained. The thicknesses and area of the films were held constant at ~0.7 mm and ~5 x 5 mm^2, respectively. Table S1 shows the corresponding dimensions of Films I and II with labels and Au content.

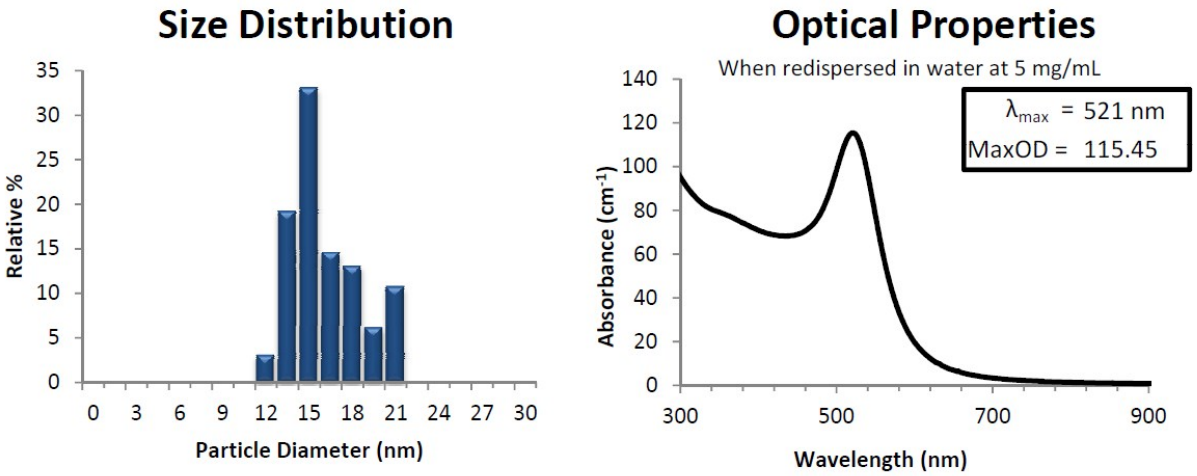

Figure S1. Size distribution (LHS) and absorption spectra (RHS) of 16 nm AuNPs purchased from Nanocomposix.

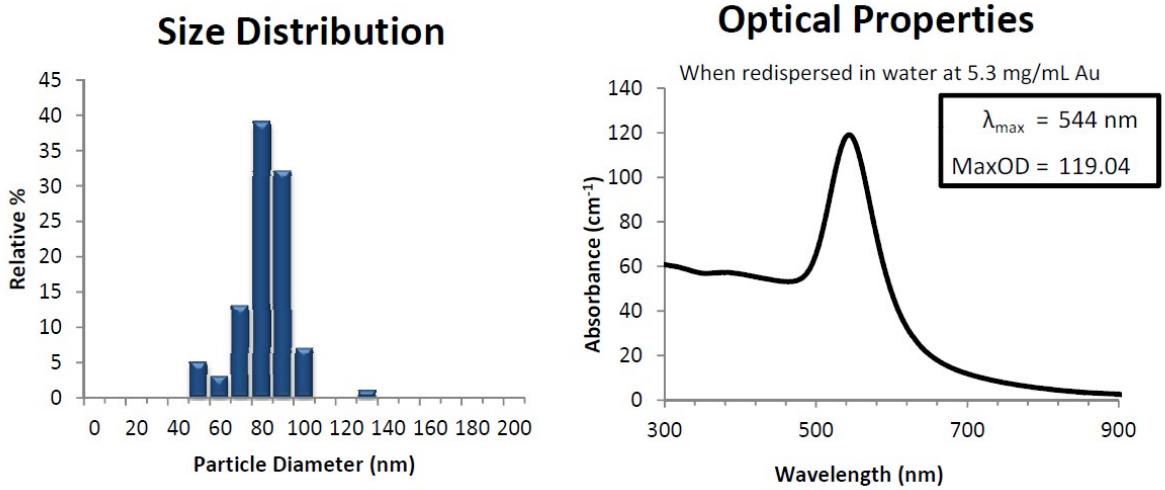

Figure S2. Size distribution (LHS) and absorption spectra (RHS) of 76 nm AuNPs purchased from Nanocomposix.

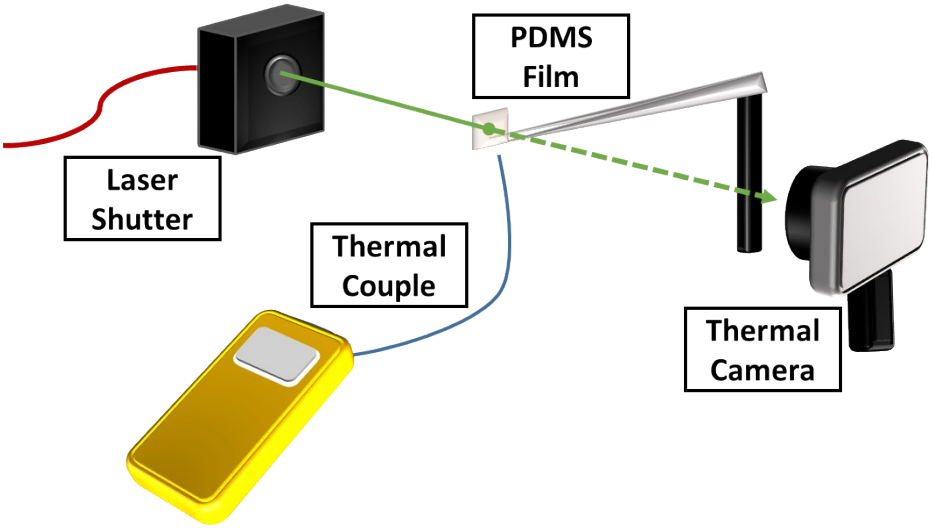

Figure S3. Thermometric setup comprised of a 532 nm laser, laser shutter, AuNP-PDMS nanocomposite sample, and an infrared camera. A type-K thermocouple was used for secondary validation of ambient environment measurements.

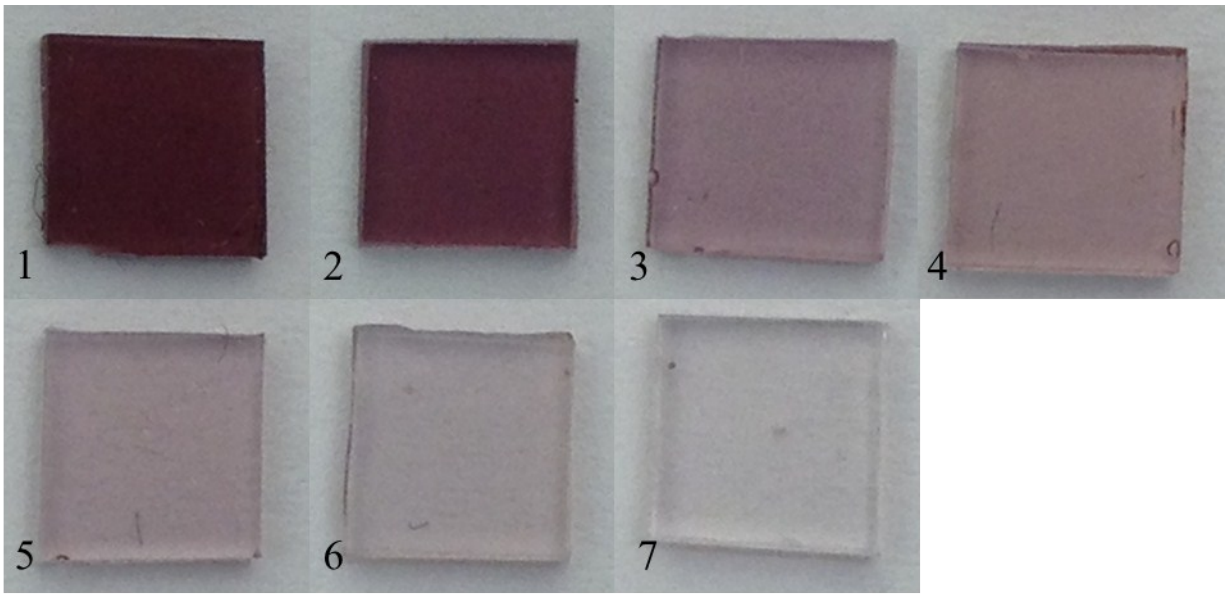

Figure S4. Images of the rAuNP-PDMS (Film II) with random sized AuNPs with AuNP content decreasing from 1 to 7.

Table S1. Dimensions of Films I and II used in manuscript with corresponding labels and Au content.

	Manuscript Label	Au Content (mass %)	Length (m)	Width (m)	Thickness (m)
Film I		**16 nm**			
	F	0.001	0.0059	0.0056	0.00093
	E	0.002	0.0053	0.0059	0.00125
	D	0.005	0.0056	0.0061	0.00103
	C	0.0075	0.0058	0.0061	0.00145
	B	0.01	0.0056	0.0058	0.00107
	A	0.015	0.0048	0.0058	0.00107
		76 nm			
	d	0.005	0.0058	0.0053	0.00064
	c	0.0075	0.0063	0.0057	0.00133
	b	0.01	0.0057	0.0058	0.00071
	a	0.015	0.0057	0.0060	0.00124
Film II		**rAuNP**			
	7	0.0073	0.0050	0.0050	0.00069
	6	0.0141	0.0050	0.0049	0.00065
	5	0.0262	0.0050	0.0049	0.00064
	4	0.0368	0.0049	0.0049	0.00065
	3	0.0543	0.0049	0.0048	0.00064
	2	0.0844	0.0048	0.0048	0.00067
	1	0.1896	0.0048	0.0048	0.00069