

A single-cell based mass cytometry study on heterogeneous interactions between upconversion nanoparticles and human immune cells

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Figure S2. Zeta potential analysis of UCNP@Polymer

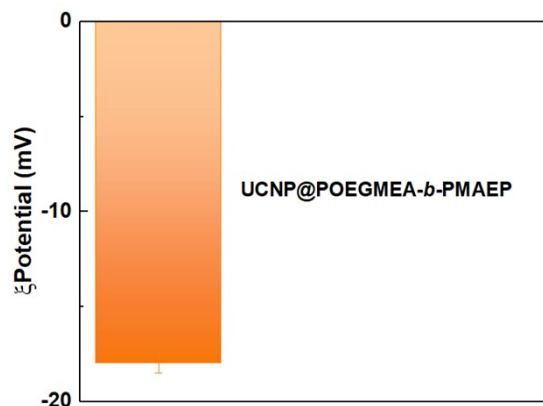


Table S1. Statistic of cell type identification in untreated, 0.5, 1, and 2 ppm of UCNP@Polymer. data was presented in mean and standard deviation.

	Untreated		0.5 ppm		1 ppm		2ppm	
	Value	Error	Value	Error	Value	Error	Value	Error
mDCs	25.67	1.28	24.84	1.24	45.06	2.25	39.50	1.97
Classical monocytes	23.84	1.19	22.01	1.10	12.83	0.64	12.25	0.61
Naive B cells	5.76	0.29	4.93	0.25	2.93	0.15	3.13	0.16
Memory killer T cells	4.10	0.21	4.47	0.22	3.29	0.16	3.37	0.17
Naive killer T cells	3.91	0.20	3.43	0.17	2.81	0.14	3.14	0.16
Memory B cells	3.21	0.16	3.13	0.16	3.23	0.16	3.62	0.18
Naive helper T cells	3.01	0.15	1.40	0.07	0.73	0.04	1.09	0.05
Memory helper T cells	2.80	0.14	2.67	0.13	1.66	0.08	1.87	0.09
Non-classical monocytes	1.14	0.06	1.53	0.08	1.98	0.10	2.13	0.11
Intermediate monocytes	0.38	0.02	0.22	0.01	0.21	0.01	0.16	0.01
Neutrophils	0.28	0.01	0.18	0.01	0.11	0.01	0.11	0.01
pDCs	0.27	0.01	0.43	0.02	0.47	0.02	0.48	0.02

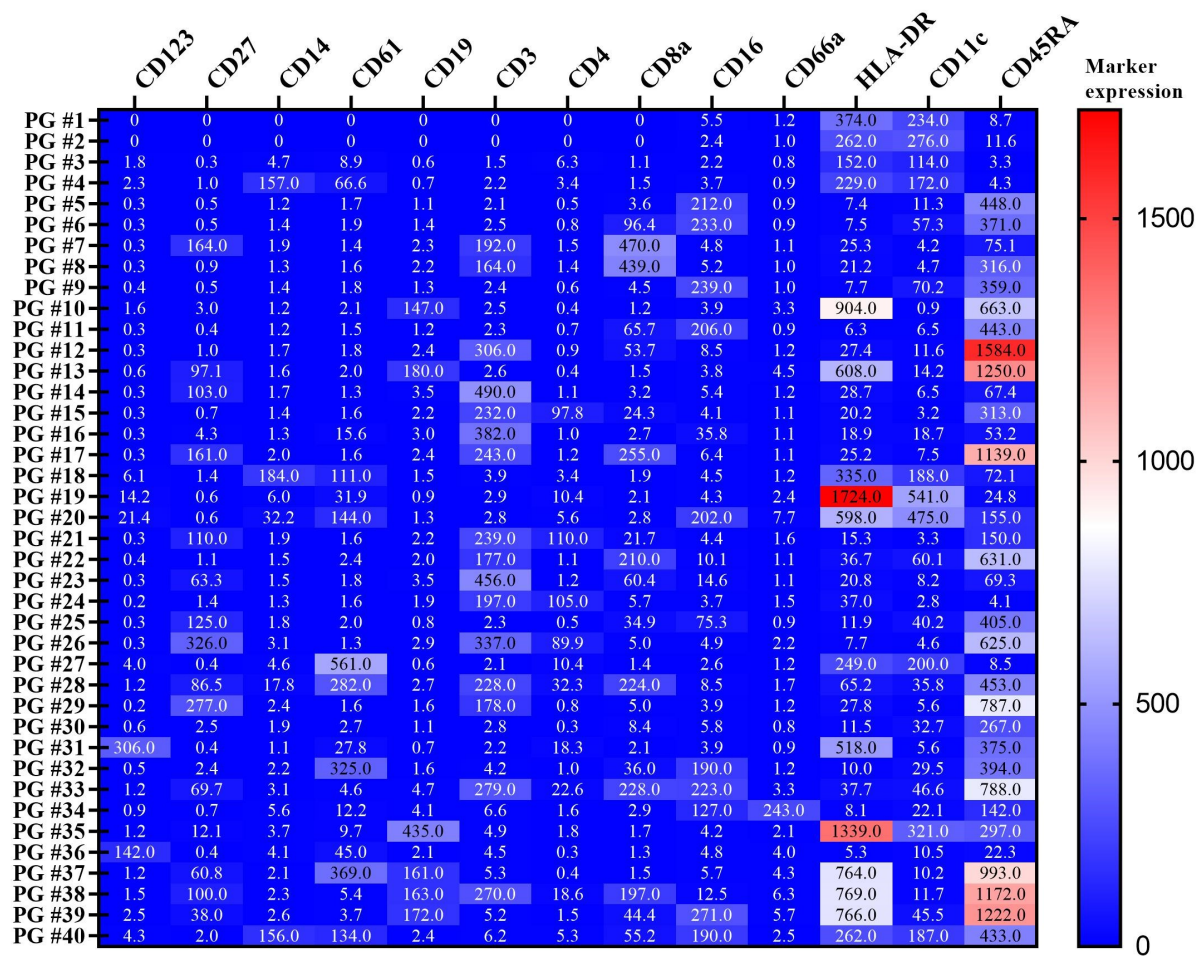


Figure S3. Heatmap showing marker expression in PhenoGraph clusters of total live cells.

Table S2. Population abundance of Phenograph clustering. Summarized statistic data was presented in mean and standard deviation.

	Untreated		0.5 ppm		1 ppm		2ppm	
	Value	Error	Value	Error	Value	Error	Value	Error
PG#1	17.116	0.8558	11.122	0.5561	6.9	0.345	6.63	0.3315
PG#2	0.05	0.0025	0.122	0.0061	14.26	0.713	13.026	0.6513
PG#3	0.15	0.0075	0.48	0.024	13.544	0.6772	12.16	0.608
PG#4	4.994	0.2497	9.61	0.4805	4.71	0.2355	3.734	0.1867
PG#5	6.41	0.3205	8.132	0.4066	3.686	0.1843	4.08	0.204
PG#6	6.164	0.3082	5.484	0.2742	4.934	0.2467	5.094	0.2547
PG#7	5.058	0.2529	5.41	0.2705	4.316	0.2158	4.544	0.2272
PG#8	3.98	0.199	5.08	0.254	4.268	0.2134	4.676	0.2338
PG#9	4.77	0.2385	4.614	0.2307	3.458	0.1729	3.504	0.1752
PG#10	5.378	0.2689	4.418	0.2209	2.518	0.1259	2.648	0.1324
PG#11	4.524	0.2262	4.972	0.2486	2.588	0.1294	2.76	0.138
PG#12	4.174	0.2087	4.478	0.2239	2.72	0.136	3.014	0.1507
PG#13	3.554	0.1777	3.374	0.1687	3.532	0.1766	3.818	0.1909
PG#14	3.702	0.1851	4.142	0.2071	3.014	0.1507	2.974	0.1487
PG#15	4.024	0.2012	3.826	0.1913	2.796	0.1398	2.952	0.1476
PG#16	3.626	0.1813	4.08	0.204	2.654	0.1327	2.628	0.1314
PG#17	3.588	0.1794	3.342	0.1671	2.304	0.1152	2.66	0.133
PG#18	2.82	0.141	2.804	0.1402	2.048	0.1024	2.282	0.1141
PG#19	1.446	0.0723	1.792	0.0896	3.09	0.1545	3.23	0.1615
PG#20	1.846	0.0923	2.17	0.1085	2.302	0.1151	2.432	0.1216
PG#21	2.948	0.1474	2.256	0.1128	1.348	0.0674	1.542	0.0771
PG#22	1.144	0.0572	1.19	0.0595	1.226	0.0613	1.18	0.059
PG#23	1.042	0.0521	1.188	0.0594	0.982	0.0491	1.01	0.0505
PG#24	1.084	0.0542	1.252	0.0626	0.858	0.0429	0.936	0.0468
PG#25	0.826	0.0413	0.952	0.0476	0.858	0.0429	0.92	0.046
PG#26	1.806	0.0903	0.626	0.0313	0.214	0.0107	0.47	0.0235
PG#27	0.016	0.001	0.028	0.0014	1.384	0.0692	1.072	0.0536
PG#28	0.696	0.0348	0.42	0.021	0.53	0.0265	0.742	0.0371
PG#29	0.634	0.0317	0.592	0.0296	0.486	0.0243	0.44	0.022
PG#30	0.392	0.0196	0.554	0.0277	0.514	0.0257	0.6	0.03
PG#31	0.33	0.0165	0.51	0.0255	0.476	0.0238	0.51	0.0255
PG#32	0.63	0.0315	0.392	0.0196	0.266	0.0133	0.488	0.0244
PG#33	0.104	0.0052	0.03	0.0015	0.41	0.0205	0.38	0.019
PG#34	0.28	0.014	0.18	0.009	0.156	0.0078	0.172	0.0086
PG#35	0.102	0.0051	0.126	0.0063	0.156	0.0078	0.192	0.0096
PG#36	0.308	0.0154	0.102	0.0051	0.084	0.0042	0.062	0.0031
PG#37	0.184	0.0092	0.122	0.0061	0.092	0.0046	0.12	0.006
PG#38	0.064	0.0032	0.016	0.001	0.15	0.0075	0.184	0.0092
PG#39	0.028	0.0014	0.012	0.001	0.098	0.0049	0.096	0.0048
PG#40	0.008	0.001	0	0	0.07	0.0035	0.038	0.0019