Electronic Supplementary Material (ESI) for Analyst.

Supplementary Information

Metabolic Mapping with Plasmonic Nanoparticle Assemblies

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SUPPORTING FIGURES

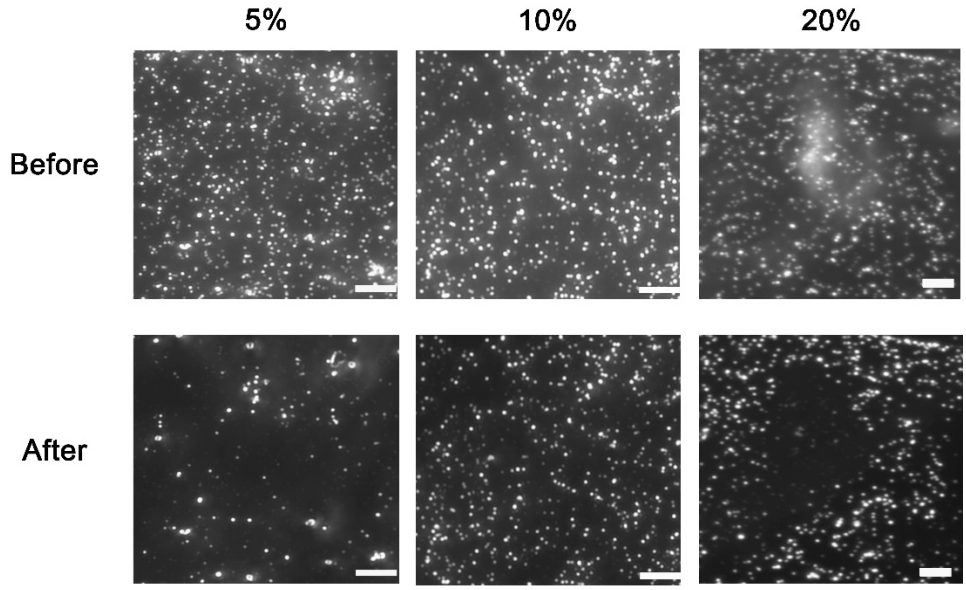

Figure S1. Gray-scale darkfield images of assemblies before (top) and after (bottom) sandwiching with cancer cells in lysis buffer containing various amounts of glycerol (5% , 10% and 20%). Scale bar: 10 μm.

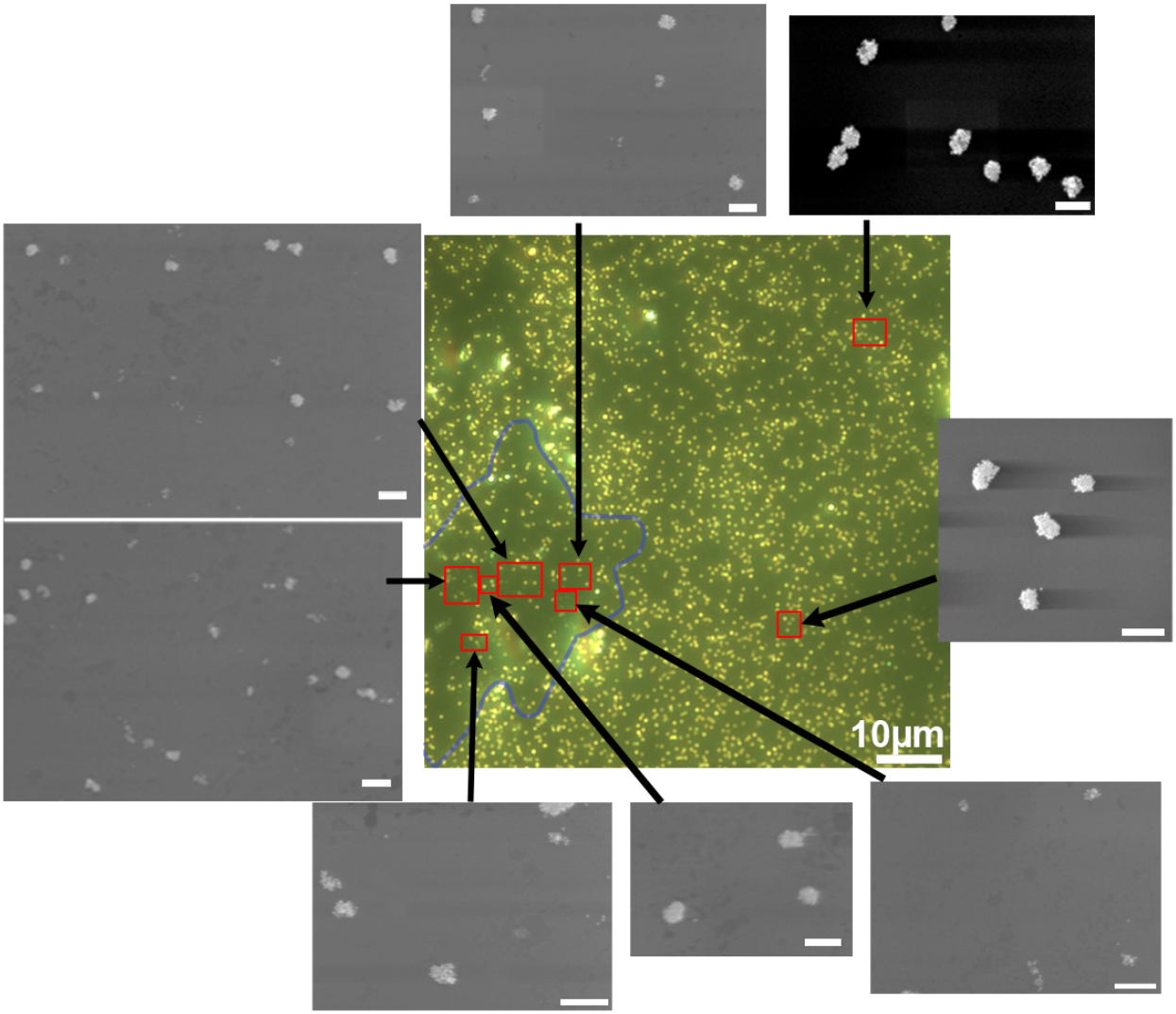

Figure S2. SEM-darkfield correlated imaging of assemblies. The area in contact with the lysed cell is outlined in blue. For correlation purpose, aggregates distinguishable in darkfield microscopy are shown. Scale bar for SEM images: 500 nm.

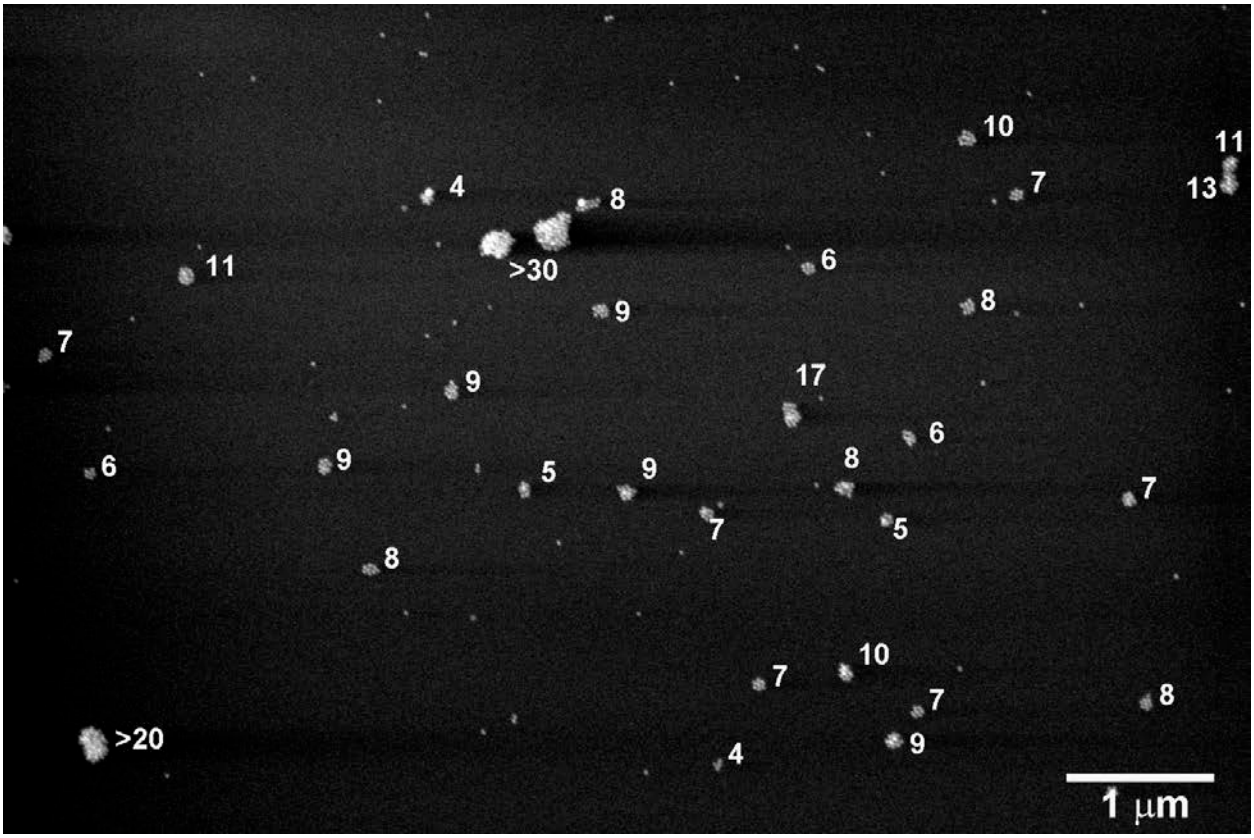

Figure S3. SEM image of nanostructures upon contact with a lysed cell; most structures disassembled to smaller clusters with some single AuNP and larger aggregates remaining. The numbers of satellite nanoparticles are shown.

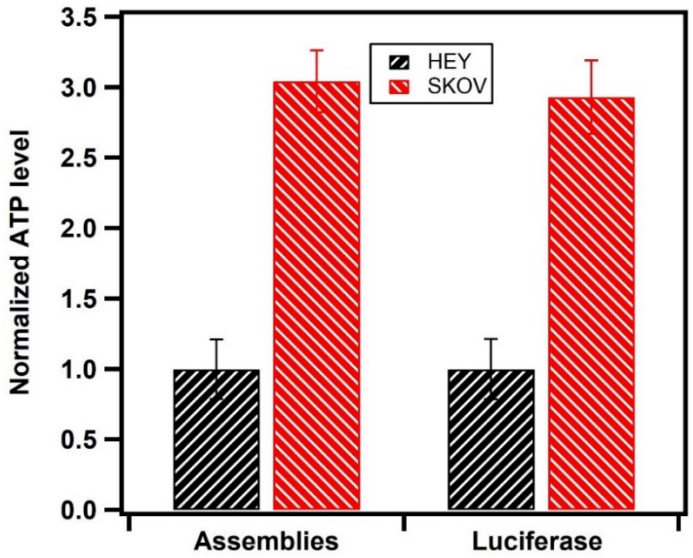

Figure S4. The ensemble ATP levels of two ovarian cell lines (SKVO3.ip1 and HEY) measured using nanoparticle (without glycerol) and luminescence luciferase assay. Error bars represent the standard deviation of triplicate samples.

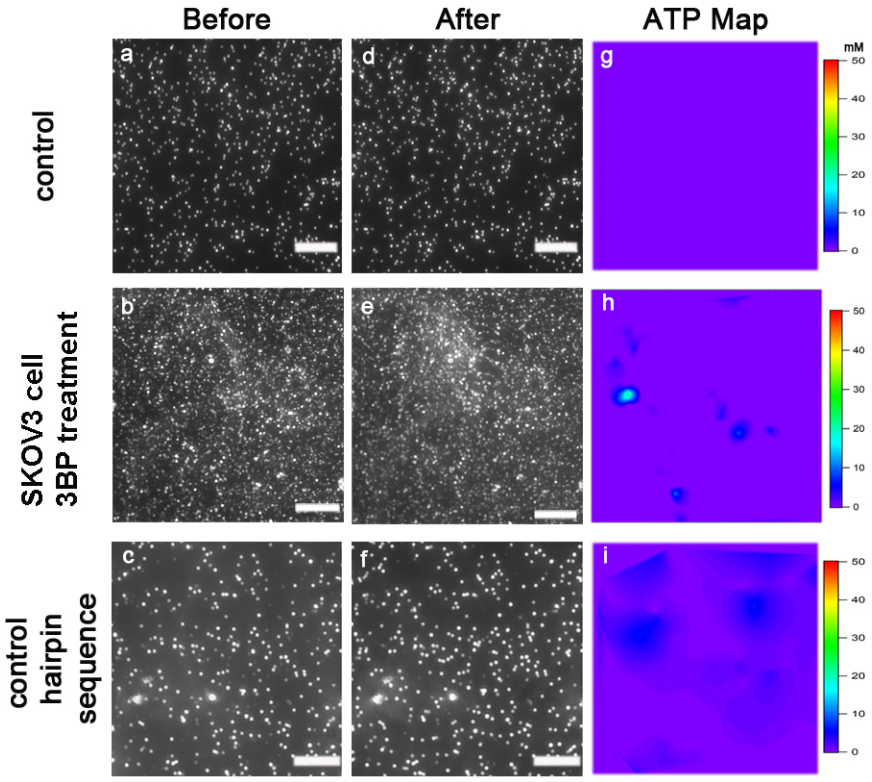

Figure S5. Darkfield images of control experiments of ATP-aptamer linked AuNP assemblies: before and after exposure to the lysis buffer without cells (a and d); to cells treated with 3-bromopyruvate (b and e). Darkfield images of a control sample comprising assemblies linked by non-ATP-targeting DNA sequences (Seq. 3 and 4) before (c) and after (f) in contact with lysed cells. The interpolated ATP concentration maps are shown in (g), (h) and (i) correspondingly. Scale bar: 10 μm.

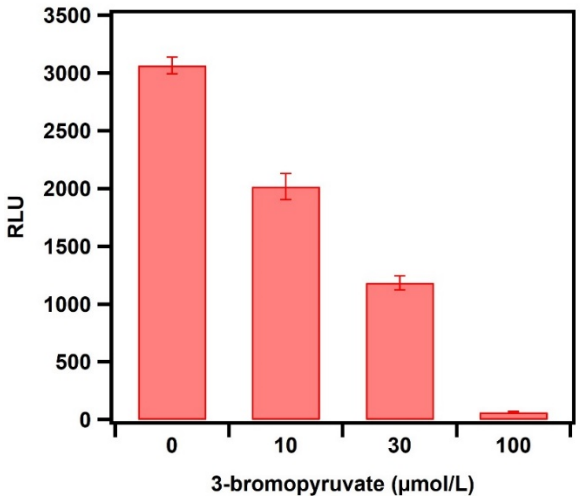

Figure S6. ATP levels of SKOV3.ip1 cells treated with 3-bromopyruvate for 16 hours as measured by luciferase luminescent activity.

SUPPORTING TABLE

Table S1. Fitted parameters of calibration curves ($I = mC + b$) of assemblies grouped by the initial scattering intensity. The detection limit and limit of quantification are calculated based on the signal of I_0 - 3s and I_0 - 10s where s is the standard deviation of the scattering intensity.

Initial scattering intensity	Fitted parameters		3s	LOD (mM)	LOQ (mM)
	m	b			
90-110	-10.8	63.0	4.6	0.054	0.06
110-130	-16.6	75.2	5.8	0.091	0.34
130-150	-17.9	79.2	5.2	0.135	1.25
150-170	-21.5	91.6	5.6	0.163	2.37
170-190	-26.2	103.5	6.3	0.189	3.88
190-210	-27.1	121.1	6.3	0.201	4.74