

a

	Universal Site 1, 'Barcode Sequence', Random Sequence, Universal Site 2
Barcode 1	A*G*A*CGTGTGCTCTTCCGATCT GAGGGTACTT NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 2	A*G*A*CGTGTGCTCTTCCGATCT GACAATTGCC NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 3	A*G*A*CGTGTGCTCTTCCGATCT TAACGCACCT NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 4	A*G*A*CGTGTGCTCTTCCGATCT ATGATCGTCG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 5	A*G*A*CGTGTGCTCTTCCGATCT TGTCTCCCAT NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 6	A*G*A*CGTGTGCTCTTCCGATCT GGAGAAACAG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 7	A*G*A*CGTGTGCTCTTCCGATCT CGTACAAACG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 8	A*G*A*CGTGTGCTCTTCCGATCT GATTTGTGGG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 9	A*G*A*CGTGTGCTCTTCCGATCT TTGCAGCCTT NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 10	A*G*A*CGTGTGCTCTTCCGATCT GAATGCTGAC NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 11	A*G*A*CGTGTGCTCTTCCGATCT ATCCATGAGG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 12	A*G*A*CGTGTGCTCTTCCGATCT TTCCACGATG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 13	A*G*A*CGTGTGCTCTTCCGATCT GCTGGGAATT NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 14	A*G*A*CGTGTGCTCTTCCGATCT CAAAACGACG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 15	A*G*A*CGTGTGCTCTTCCGATCT TCTCGCCTTT NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 16	A*G*A*CGTGTGCTCTTCCGATCT CAGATCAGAG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 17	A*G*A*CGTGTGCTCTTCCGATCT GACACGTTCT NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 18	A*G*A*CGTGTGCTCTTCCGATCT GCTAAGGTCT NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 19	A*G*A*CGTGTGCTCTTCCGATCT TGTTCGACCT NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 20	A*G*A*CGTGTGCTCTTCCGATCT CCCAAAGACA NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 21	A*G*A*CGTGTGCTCTTCCGATCT CAGGTAGGAA NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 22	A*G*A*CGTGTGCTCTTCCGATCT CATTATCGCG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 23	A*G*A*CGTGTGCTCTTCCGATCT CAGAGACTGA NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 24	A*G*A*CGTGTGCTCTTCCGATCT TGACATGCAC NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 25	A*G*A*CGTGTGCTCTTCCGATCT TGTTGGTTCC NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 26	A*G*A*CGTGTGCTCTTCCGATCT CTCTCTGAAC NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 27	A*G*A*CGTGTGCTCTTCCGATCT CACTAGCCAA NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 28	A*G*A*CGTGTGCTCTTCCGATCT TGACTTTGCC NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 29	A*G*A*CGTGTGCTCTTCCGATCT TTCAGCGAAG NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T
Barcode 30	A*G*A*CGTGTGCTCTTCCGATCT ACAGGCATAC NNNNNNNNNN AGATCGGAAGAGCGTCG*T*G*T

b

Binds to universal site 1

Binds to universal site 2

Index for Illumina Sequencing (i5 / i7)

Universal Reverse Primer (i5)	AATGATACGGCGACCACCGAGATCTACACAGGCTATAACACTCTTTCCCTACACGACGCTCTTCCGATCT
Index Base Forward Primer	TGACTGGAGTTCAGACGTGTGCTCTTCCGATCT
Index Final Forward Primer (i7)	CAAGCAGAAGACGGCATAACGAGATGGCAGATA GTGACTGGAGTTCAGACGTGTG

Figure S1. DNA barcodes and PCR-based barcode amplification. **(a)** Up to 30 different nanoparticles were analyzed in the same mouse using the following thirty sequences. The barcodes were subdivided into 'universal' sites, which were the same for all sequences, and unique barcodes, which varied with each sequence. The random sequence was inserted to monitor potentially excessive PCR amplification. **(b)** PCR primers used to amplify the DNA sequences. The three primers were added together in a PCR reaction. The Index base was added at 1/10th the concentration of the Universal Reverse and Index Final Forward Primers. The PCR conditions are outlined in detail in the Methods Section. The * refers to a phosphorothioate-modified linkage, and N's represent random nucleotides.

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Figure 2b, Figure 2c. Dose is 0.04 mg/kg for each barcode.						
Name in Figure	Lipid	PEG	Lipid Mol %	PEG Mol %	Cholesterol Mol %	DSPC Mol %
Liver LNP	C12-200	C14 PEG2000	50	1.5	38.5	10
Lung LNP1	7C1	C14 PEG2000	70	30	0	0
Lung LNP2	7C1	C14 PEG2000	80	0	20	0
Lung LNP3	7C1	C14 PEG2000	70	20	10	0

Figure 2d, Supplementary Figure 3a						
Name in Figure	Lipid	PEG	Lipid Mol %	PEG Mol %	Cholesterol Mol %	DSPC Mol %
All Data Points	C12-200	C14 PEG2000	50	1.5	38.5	10

Figure 2e, Supplementary Figure 3b. Dose is 0.04 mg/kg for each barcode.						
Name in Figure	Lipid	PEG	Lipid Mol %	PEG Mol %	Cholesterol Mol %	DSPC Mol %
Liver NP1	C12-200	C14 PEG2000	50	1.5	38.5	10
Liver NP2	C12-200	C14 PEG2000	50	1.5	38.5	10
Liver NP3	C12-200	C14 PEG2000	50	1.5	38.5	10
Liver NP4	C12-200	C14 PEG2000	50	1.5	38.5	10
Liver NP5	C12-200	C14 PEG2000	50	1.5	38.5	10

Figure 2f. Dose is 0.04 mg/kg for each barcode.						
	Lipid	PEG	Lipid Mol %	PEG Mol %	Cholesterol Mol %	DSPC Mol %
	7C1	C14 PEG2000	50	0	50	0
	7C1	C14 PEG2000	50	25	25	0
	7C1	C14 PEG2000	65	15	20	0
	7C1	C14 PEG2000	65	35	0	0
	7C1	C14 PEG2000	70	30	0	0
	7C1	C14 PEG2000	70	20	10	0
	7C1	C14 PEG2000	75	25	0	0
	7C1	C14 PEG2000	80	20	0	0
	7C1	C14 PEG2000	80	15	5	0
	7C1	C14 PEG2000	90	10	0	0

Figure 3, Supplementary Figure 4, Supplementary Figure 5. Dose is 0.04 mg/kg for each barcode.								
Barcode	Lipid	PEG Tail	PEG MW (Da)	PEG Mol%	Lipid Mol %	DSPC mol%	Chol. mol%	PEG mol%
1	C12-200	14	3000	2.25	50	10	37.75	2.25
2	C12-200	14	3000	1.50	50	10	38.50	1.50
3	C12-200	18	1000	0.75	50	10	39.25	0.75
4	C12-200	18	3000	0.75	50	10	39.25	0.75
5	C12-200	16	1000	3.00	50	10	37.00	3.00
6	C12-200	16	2000	1.50	50	10	38.50	1.50
7	C12-200	16	2000	0.75	50	10	39.25	0.75
8	C12-200	16	2000	3.75	50	10	36.25	3.75
9	C12-200	18	1000	3.00	50	10	37.00	3.00
10	C12-200	16	1000	2.25	50	10	37.75	2.25
11	C12-200	18	2000	3.75	50	10	36.25	3.75
12	C12-200	14	1000	4.50	50	10	35.50	4.50
13	C12-200	14	2000	0.75	50	10	39.25	0.75
14	C12-200	14	2000	4.50	50	10	35.50	4.50
15	C12-200	14	2000	3.00	50	10	37.00	3.00
16	C12-200	18	3000	4.50	50	10	35.50	4.50
17	C12-200	14	3000	3.00	50	10	37.00	3.00
18	C12-200	18	2000	2.25	50	10	37.75	2.25
19	C12-200	16	3000	3.00	50	10	37.00	3.00
20	C12-200	18	3000	3.75	50	10	36.25	3.75
21	C12-200	14	1000	1.50	50	10	38.50	1.50
22	C12-200	14	1000	3.75	50	10	36.25	3.75
23	C12-200	18	2000	4.50	50	10	35.50	4.50
24	C12-200	18	3000	2.25	50	10	37.75	2.25
25	C12-200	18	1000	1.50	50	10	38.50	1.50
26	C12-200	16	3000	0.75	50	10	39.25	0.75
27	C12-200	16	1000	4.50	50	10	35.50	4.50
28	C12-200	14	1000	3.75	50	10	36.25	3.75
29	C12-200	16	2000	2.25	50	10	37.75	2.25
30	C12-200	16	3000	1.50	50	10	38.50	1.50

Figure S2. Formulation details for all nanoparticles described in this publication. Nanoparticle formulations 2, 3, 7, 9, 13, 19, 20, 21, 25, and 27 were used in the Factor 7 siRNA experiment in Figure 4b.

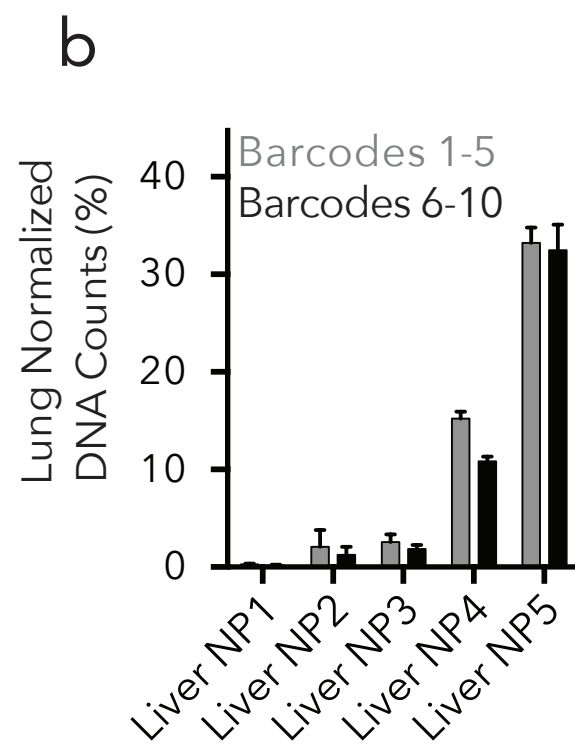
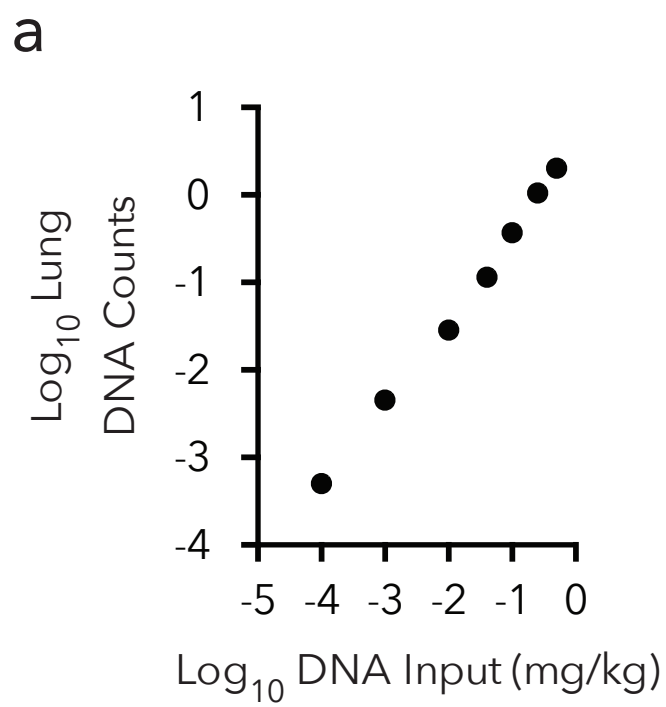


Figure S3. DNA barcoded nanoparticle biodistribution provides a linear output. **(a)** DNA barcode counts in the liver 4 hours after the administration of an ‘in vivo standard curve’. The same C12-200 nanoparticle formulation was made 7 separate times, with 7 different barcodes. These solutions were mixed together at different doses (inputs) to form an ‘in vivo standard curve’. DNA readouts align with this DNA input at doses between 0.0001 and 0.5 mg/kg DNA barcode. N = 5 mice / group. **(b)** Normalized DNA barcode counts in lung 4 hours after administration of different DNA sequences. 5 different C12-200 NPs were formulated twice, each with a different barcode. N = 5 mice / group. In all cases, the detailed NP formulation data are listed in Supplementary Table 2. In all cases, the data are plotted as average + / - standard deviation.

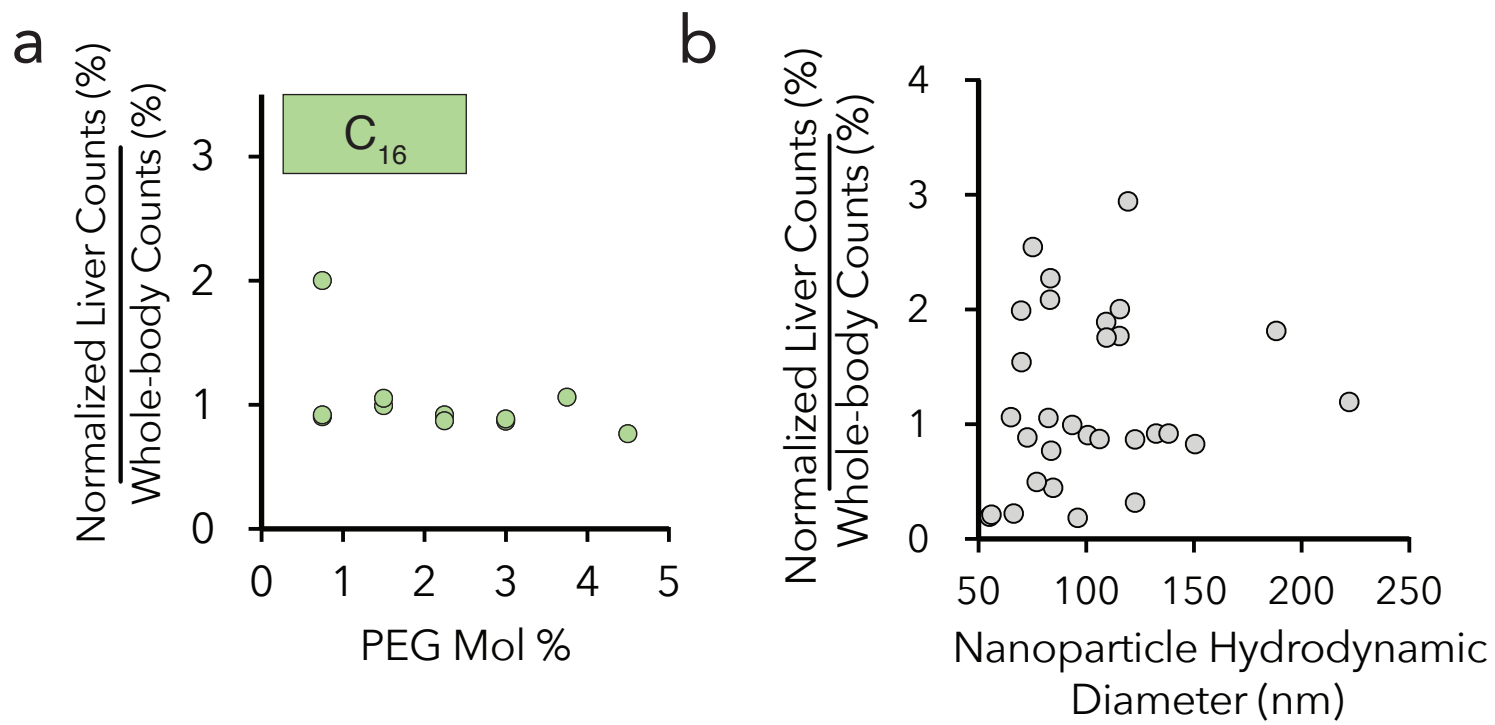


Figure S4. (a) Normalized liver counts, divided by the normalized counts for the rest of the tested tissues, as a function of PEG mole percentage. This measure quantifies how delivery to the liver, compared to the rest of the body, changes. (b) Normalized liver counts, divided by the normalized counts for the rest of the tested tissues, as a function of nanoparticle diameter.

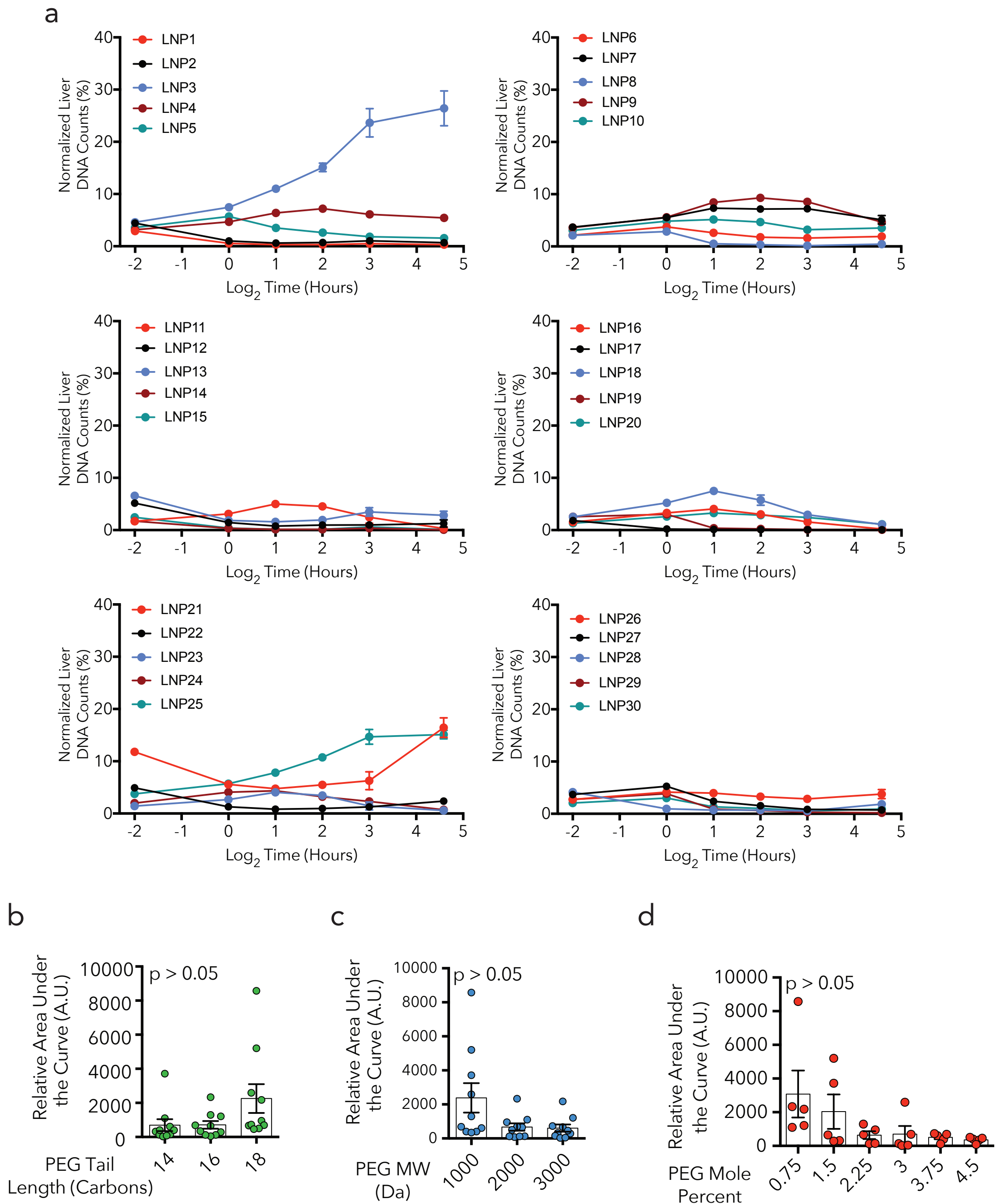
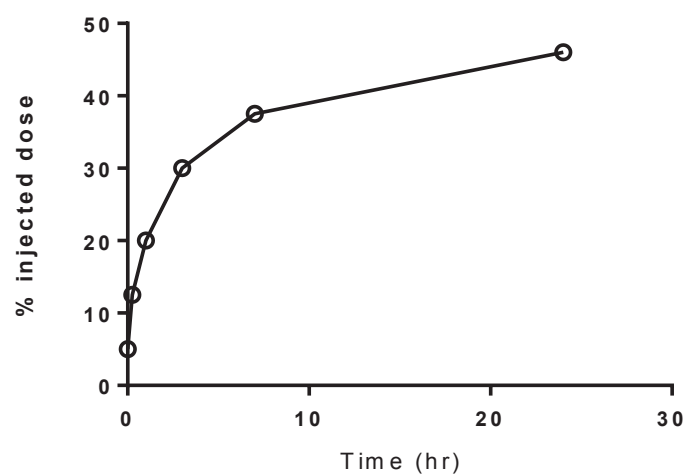


Figure S5. DNA barcoded nanoparticles facilitate high throughput in vivo analysis. **(a)** Normalized liver DNA counts for thirty nanoparticles between 0.25 and 24 hours after injection. **(b-d)** Area under the curve for 30 nanoparticles in the liver, as a function of PEG lipid length, PEG molecular weight, or mole % PEG, respectively.

Figure S6. Area Under Curve (AUC) Calculations

AUC calculations reflect a concentration in the liver, not just a normalized delivery percentage. To translate normalized liver counts for each LNP to AUC, we used a pharmacokinetic model calculated using liver-targeting LNPs with activity replicates C12-200. In this model, LNPs were formulated with siRNA-containing lipid nanoparticles ^{14}C -labelled ionizable lipids, 10% DSPC, 38.5% cholesterol, and 1.5 mol% $\text{C}_{16}\text{PEG}_{2000}$. Following intravenous injection, the liver accumulation of ^{14}C was monitored over time. We created an LNP (#6) with identical ionizable lipid, DSPC, cholesterol, and $\text{C}_{16}\text{PEG}_{2000}$. By using an identical lipid composition between as described previously using radiolabeling, we reasoned that AUC could be calculated.



Supplementary Fig. 6a. Radiolabeled LNP in the liver post intravenous injection for a LNP with 1.5 mol% C16 PEG 2000, as reported by Mui et al.

At each timepoint, the biodistribution of each of the thirty LNPs was normalized with respect to LNP #6. For example, the average barcoding biodistribution readout for representative LNPs #6, #23, and #26 were:

Supplementary Fig. 6b: Biodistribution of barcodes for selected LNPs in the liver

	0.25 hr	1 hr	2 hr	4 hr	8 hr	24 hr
LNP #6	2.98%	5.23%	3.62%	2.51%	2.34%	2.87%
LNP #23	1.47%	2.81%	4.20%	3.67%	1.60%	0.66%
LNP #26	2.44%	3.72%	3.52%	2.98%	2.68%	3.66%
Sum of LNPs #1-30	100%	100%	100%	100%	100%	100%

Normalized to LNP #6, these values become:

Supplementary Fig. 6c: Normalized biodistribution of LNP barcodes in the liver with respect to LNP6

	0.25 hr	1 hr	2 hr	4 hr	8 hr	24 hr
LNP #6	1.00	1.00	1.00	1.00	1.00	1.00
LNP #23	0.49	0.54	1.16	1.46	0.68	0.23
LNP #26	0.82	0.71	0.97	1.18	1.15	1.28
Sum of LNPs #1-30	30.00	30.00	30.00	30.00	30.00	30.00

Then, LNP #6 is fit to the curve shown in Supplementary Fig. 6a. At each timepoint, there is a “scaling factor” which is multiplied by the value for LNP in #6 to fit the curve shown in Figure 1. These scaling factors are shown below.

Supplementary Fig. 6d: Scaling factor to fit LNP #6 to the curve shown in Figure 1.

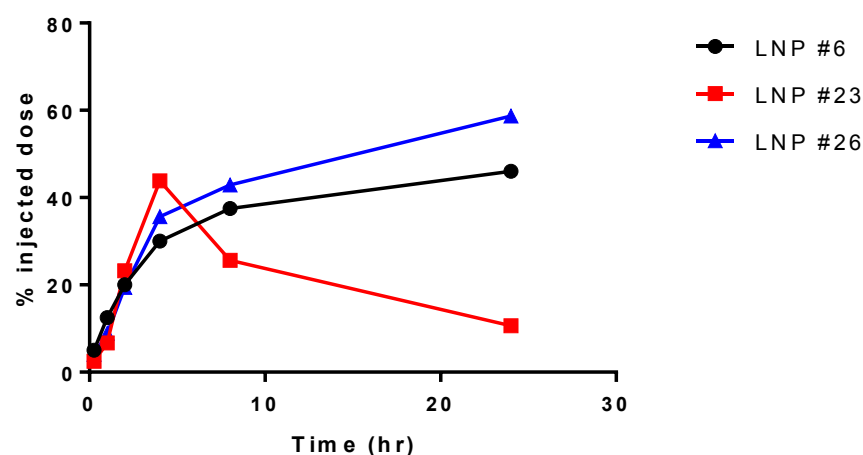
	0.25 hr	1 hr	2 hr	4 hr	8 hr	24 hr
Scaling factor	5.0	12.5	20.0	30.0	37.5	46.0

Each value in Table 2 is then multiplied by the scaling factor at each timepoint to find the relative concentration of each LNP #1-30 in the liver, as shown below.

Supplementary Fig. 6e: Normalized amount of selected LNP barcodes in the liver

	0.25 hr	1 hr	2 hr	4 hr	8 hr	24 hr
LNP #6	5.0	12.5	20.0	30.0	37.5	46.0
LNP #23	2.5	6.7	23.2	43.8	25.6	10.6
LNP #26	4.1	8.9	19.4	35.6	42.9	58.7

These example curves are shown plotted in Figure 2 below.



Supplementary Fig. 6f: % of Injected dose, for different LNPs in the liver 0.25, 1, 2, 4, 8, or 24 hours after injection.

Using Supplementary Fig. 6f, the area under the curve (units of concentration * time) were calculated by integrating under the curve, using a trapezoidal rule in Prism (GraphPad). Finally, each AUC was normalized with respect to the input barcode read to account for slight variations in barcode concentration or amplification. This results in the final relative AUC for each LNP.

Data related to Figure 2b-c.				
Particle	C12-200	7C1, 70.0.30	7C1, 70.10.20	7C1, 80.0.20
Barcode	Nano_3	Nano_4	Nano_7	Nano_8
Control	294	335	236	358
FreshLung1	408	2012	3006	3802
FreshLung2	487	1953	3296	4181
FreshLung3	141	551	871	1199
FreshLung4	258	1457	2244	3040
FreshLiver1	4093	2789	3617	4229
FreshLiver2	3436	2983	4270	4588
FreshLiver3	2795	2377	2923	3170
FreshLiver4	2579	2300	3130	3266
24hLung1	371	1767	2511	3490
24hLung2	488	2004	2805	4238
24hLung3	196	963	1595	2207
24hLung4	63	411	547	769
24hLiver1	3338	2881	3521	4024
24hLiver2	1708	1500	2111	2228
24hLiver3	2196	2074	2600	3203
24hLiver4	2429	2459	3211	3641

Figure S7. Raw DNA counts for experiments depicted in Figures 2-4. X.Y.Z (for example, 70.0.30) refers to the molar percentage of the lipid, cholesterol, and PEG, respectively.

Data related to Figure 2d.

Dose administered (mg/kg)	1	0.75	0.5	0.25	0.1	0.04	0.01	0.001	0.0001
Barcode	Nano_14	Nano_15	Nano_16	Nano_17	Nano_18	Nano_19	Nano_20	Nano_21	Nano_22
Lung6	274878	113047	126206	67253	22740	6685	1686	270	53
Lung7	234548	118401	106853	55228	19716	6493	1642	213	16
Lung8	226216	88798	101339	52858	18040	5583	1306	222	25
Lung9	274368	119608	126030	65172	23725	6856	1836	343	28
Lung10	232533	108925	108212	54395	19707	6417	1552	223	21
Liver6	237274	102206	106710	48610	22667	8340	1819	217	20
Liver7	219183	95648	92747	45721	20010	7905	1699	181	25
Liver8	234203	102772	104033	49756	21960	8739	1786	183	23
Liver9	229421	102644	103553	50755	21291	7762	1689	212	18
Liver10	172843	80544	72559	36010	15076	5858	1168	152	17
LinCtl	152787	146089	64092	33381	12219	6053	1214	113	17

Data related to Figure 2e.

Particle	Particle 1	Particle 2	Particle 3	Particle 4	Particle 5	Particle 1	Particle 2	Particle 3	Particle 4	Particle 5
Barcode	Nano_14	Nano_15	Nano_16	Nano_17	Nano_18	Nano_19	Nano_20	Nano_21	Nano_22	Nano_23
Lung1	30753	15303	23695	14884	213080	191387	99076	72999	1672	1134
Lung2	18875	11701	21041	14970	204392	200286	99185	71638	1444	988
Lung3	4004	3067	9681	7825	183048	183504	73728	51909	1177	771
Lung4	9711	7296	12645	9768	191550	191457	94225	66402	2363	1654
Lung5	2323	1802	9644	7596	170664	170854	77273	53232	1064	889
Liver1	19060	10972	19582	15975	126777	116058	82390	73773	4902	4747
Liver2	21431	11673	21939	18587	108918	94561	68035	70293	6898	6544
Liver3	20496	12028	24982	21389	157330	142562	97370	91633	6882	7679
Liver4	31837	17034	29718	25299	176659	165811	112208	110146	9254	9597
Liver5	17738	10261	20443	17962	143834	133238	82252	78753	5581	6681
SwapCtl	16484	19834	21549	20238	19068	21518	21581	19229	21339	16144

Data related to Figure 2f.										
Particle	7C1, 50:0:50	7C1, 50:25:25	7C1, 65:20:15	7C1, 65:0:35	7C1, 70:0:30	7C1, 70:10:20	7C1, 75:0:25	7C1, 80:0:20	7C1, 80:5:15	7C1, 90:0:10
Barcode	Nano_1	Nano_2	Nano_3	Nano_4	Nano_5	Nano_6	Nano_7	Nano_8	Nano_9	Nano_10
Cell1	5734	1847	2361	2415	2953	5144	2387	2971	722	2989
Cell2	7363	2928	2873	3375	3878	7754	3382	3839	1124	4213
Cell3	3849	1049	1462	1646	1853	3717	1777	1955	453	2113
Cell4	3556	1084	1323	1493	1798	3526	1661	1970	470	1935
Tissue1	2981	902	1206	1551	1698	2909	1363	1910	467	1712
Tissue2	15142	4797	6201	7813	7487	15813	7492	9046	2122	8529
Tissue3	4292	1396	1747	1915	2387	4218	2077	2516	632	2387
Tissue4	2173	693	918	947	1197	1974	957	1238	319	1204

Data related to Figure 3b-c.

	14	14	18	18	16	16	16	16	18	16	18	14	14	14	14	
PEG Tail																
PEG MW	3000	3000	1000	3000	1000	2000	2000	2000	1000	1000	2000	1000	2000	2000	2000	2000
PEG Mol Wt	2.25	1.5	0.75	0.75	3	1.5	0.75	3.75	3	2.25	3.75	4.5	0.75	4.5	3	3
Barcode	Nano_9	Nano_10	Nano_11	Nano_12	Nano_13	Nano_14	Nano_15	Nano_16	Nano_17	Nano_18	Nano_19	Nano_20	Nano_21	Nano_22	Nano_23	Nano_23
Lung1	12456	21646	46828	11383	9323	3384	18407	2674	12830	16156	8851	11474	61221	2955	6573	100
Lung2	11229	20010	58214	14510	13211	4166	23832	2844	20098	22789	13108	13706	69602	2565	5481	100
Lung3	8083	13269	31535	8095	10244	3063	13923	2687	9874	15237	10477	8327	39495	2056	4190	100
Liver1	9924	16009	31928	7084	8867	2885	12115	2554	5990	14389	2934	8998	42415	2508	5469	100
Liver2	8825	15068	31565	6965	9311	2781	11579	2800	5110	14341	2703	9901	47546	2270	4932	100
Liver3	11316	18292	28022	7042	8528	2980	10519	3832	4346	13088	3322	9006	50097	2912	6836	100
Liver4	10237	17406	29114	7449	8144	2916	11100	3485	4257	13342	2821	9715	63165	2100	5093	100
Pancreas1	3146	4608	42706	8216	17418	3760	18684	4941	18184	23943	12493	7397	14047	1071	1918	100
Pancreas2	2520	3714	40030	9108	17882	4053	20858	6212	17386	26148	10930	6891	12016	916	1724	100
Pancreas3	3288	3982	52479	8801	21201	4806	18136	8146	17605	27746	14189	7300	9945	1354	2583	100
Pancreas4	3838	6041	41882	7009	17067	3607	17133	5642	12851	23192	9990	10382	20207	1294	2420	100
Kidney1	2671	3940	31024	14197	13920	3904	22395	1780	38563	22348	27171	3712	10522	798	1628	100
Kidney2	2761	4363	32846	12562	13061	3415	18896	2169	30901	20954	20698	4622	13636	1103	1848	100
Kidney3	2383	3621	21304	8328	11744	3176	13338	2388	19633	17103	19270	3082	9493	860	1666	100
Muscle1	1552	1957	26541	5721	9390	2686	10854	2895	14193	13840	14409	2720	4148	680	1100	100
Muscle4	1831	2264	35486	6395	14465	3309	14788	4508	12452	19873	15551	3896	5817	785	1241	100
Muscle3	2068	2862	19565	6024	9011	2915	10256	3992	13610	12598	23018	2768	5672	1163	1309	100
Uterus2	4866	5559	24746	8260	9645	2642	13133	3840	19591	14319	18605	5624	11978	2188	3996	100
Uterus1	2973	4425	33658	12388	11166	3488	18484	3483	31198	18899	28930	4056	12234	966	1713	100
Uterus3	1308	2152	25945	7698	13977	2728	11415	2597	20940	18842	21803	2547	6134	557	999	100
Uterus4	1902	3165	25981	9254	11545	2751	13819	1762	24529	17678	22098	3657	9352	1235	1383	100
Brain1	1892	3442	33313	15597	9235	3010	20220	889	55636	17285	36399	2418	8708	544	1066	100
Brain2	1181	2148	33710	13577	10071	2580	15964	912	40996	16528	26128	2160	6680	419	897	100
Brain3	2264	3270	29146	12436	13662	3684	17982	2170	32017	21303	33090	2498	7656	772	1377	100
Brain4	2311	3915	37587	11873	10228	2919	17503	1780	34747	18832	25960	3858	11253	788	1415	100
Heart1	1928	2862	21409	14004	12858	3114	17529	1938	34958	20161	25371	3456	6148	1028	1495	100
Heart2	1675	2664	25170	18366	18202	3701	16652	2284	30636	26054	24145	3688	7078	937	1607	100
Heart3	1592	2016	18015	11675	23799	4450	18192	2441	17812	28955	20886	2676	4401	836	1248	100
Heart4	2504	3809	30891	13924	16554	3454	17966	2576	29340	24636	24025	5859	9574	1552	2472	100

18	14	18	16	18	14	14	18	18	18	16	16	14	16	16
3000	3000	2000	3000	3000	1000	1000	2000	3000	1000	3000	1000	1000	2000	3000
4.5	3	2.25	3	3.75	1.5	3.75	4.5	2.25	1.5	0.75	4.5	3.75	2.25	1.5
Nano_24	Nano_25	Nano_26	Nano_27	Nano_28	Nano_29	Nano_30	Nano_31	Nano_32	Nano_33	Nano_34	Nano_35	Nano_36	Nano_37	Nano_38
10024	5430	7996	2052	7107	28273	15532	7966	5724	37041	28855	5927	18301	6210	5192
15455	5143	10076	2490	10241	34419	17572	11778	7195	49188	32001	7994	20163	8225	5667
11636	3451	6637	2122	9482	20728	10690	11941	5395	26444	20917	9256	13281	6241	4037
3049	4317	3665	1952	2392	17192	12249	2516	3037	27789	22858	8040	14479	5492	3595
2688	4182	3556	2128	2126	17947	13504	2379	2668	26222	22373	9184	15297	5676	3596
3195	5111	3780	2737	2895	16178	12458	3130	3402	24720	24137	8885	14355	5682	3630
2752	4608	3994	2538	2240	18035	12888	2507	3343	25449	25649	7378	13407	5614	3844
9937	1001	8502	3417	8513	14445	9394	12142	6026	36798	12569	22570	12907	8691	3558
8178	818	8037	4554	6921	13698	8666	10457	6277	43671	15271	23841	12211	9404	3951
11365	1195	8553	5802	10157	19336	8228	15130	7310	42235	15102	30659	11745	11293	4493
8019	1327	6183	3960	7265	17979	14080	10567	5797	32193	15825	23014	19115	8125	3494
29984	1065	17129	1935	20193	6008	4846	25477	9908	60089	10927	12081	6266	8546	3941
24626	1202	14347	2048	15282	9021	6374	19210	8337	54393	11546	10994	8046	7579	3787
24011	947	10211	2291	17393	5544	4143	23724	7618	34862	9503	10002	5284	7023	3436
15088	592	7556	3012	12874	6790	3013	16846	7397	25979	7002	13662	4642	5133	2219
14326	714	7771	4566	14308	10148	4681	18695	8959	31724	10481	22699	7379	7681	3161
25176	988	10038	5250	22602	5540	3386	28465	11422	24486	7426	14622	4739	6866	3106
20481	1763	10883	2710	16243	7110	7385	19241	8855	33578	9883	17575	10255	6213	3286
35865	1213	16176	3836	26060	8830	5181	30643	12374	47647	11006	11364	6567	8098	4013
26041	606	9988	2108	21439	5381	3382	24361	7464	34462	8619	11956	4411	8384	3167
28682	1183	12681	2186	21327	5145	4968	24625	9199	41479	8908	10534	6193	7452	3124
48402	785	24121	1270	30263	3919	3453	34727	12963	68568	8236	6426	4246	7071	3684
33842	571	17468	1184	20674	3034	2994	21725	8908	60677	8173	6086	4133	7143	3110
41194	857	17562	2415	32130	3777	3400	38667	12106	52532	11225	12537	4475	10099	4757
35222	988	16150	1732	24184	5928	5416	28637	10762	55050	10640	9762	7235	6785	3371
32032	868	17060	2011	20039	3550	4727	26607	9979	58509	7736	14257	5793	7297	3878
26445	851	17185	2369	17777	3807	5315	21522	8809	78367	11111	13497	6095	13233	6226
19385	621	11561	2873	16196	2281	3613	24089	7911	51045	10780	21068	4486	13534	5721
24836	1135	16369	2526	18554	4086	8526	24402	9087	64015	11431	15591	10218	10561	5198

Data related to Figure 3d.

Delivery to liver.															
PEG Tail	14	14	18	18	16	16	16	16	18	16	18	14	14	14	14
PEG MW	3000	3000	1000	3000	1000	2000	2000	2000	1000	1000	2000	1000	2000	2000	2000
PEG Mol Wt	2.25	1.5	0.75	0.75	3	1.5	0.75	3.75	3	2.25	3.75	4.5	0.75	4.5	3
Time (hrs)	Nano_9	Nano_10	Nano_11	Nano_12	Nano_13	Nano_14	Nano_15	Nano_16	Nano_17	Nano_18	Nano_19	Nano_20	Nano_21	Nano_22	Nano_23
0.25	78140	130654	72794	66792	65999	65711	90318	53889	79677	73303	47214	143052	159654	48425	77458
0.25	40574	71045	61051	57450	61478	61614	78515	55484	72271	68554	42438	79837	93256	22558	31989
0.25	134884	219165	156891	113466	107886	117126	151238	83010	135090	135573	74556	254509	278227	82209	119689
0.25	51099	86778	68703	44057	43955	40472	62263	34823	55613	54754	29451	93099	100613	30450	47419
1	5820	12739	52840	45356	50229	51163	59748	33126	56923	55458	42602	16530	21681	3264	3239
1	9682	19506	103795	82867	96056	108873	110924	65918	106855	106378	69078	28628	31929	5772	6004
1	10150	19986	158930	99281	94057	105548	146417	61094	124850	128049	72608	28638	32744	5908	5741
1	10543	19927	80208	53142	57787	63960	72271	46015	68047	62674	50308	26257	25054	7029	10795
2	3622	8176	98389	73466	33423	39069	92276	7355	103018	69409	71922	10967	16971	2109	2114
2	6756	13856	226508	133300	65052	85878	181225	13400	183867	142454	116060	21568	29833	4009	3781
4	7517	20966	248948	131270	46361	50075	159336	8349	181112	105921	106387	26696	45725	3480	3637
4	10730	28744	337592	196243	63501	72364	228341	12238	252102	154947	130281	34175	62422	5508	6064
4	4798	10101	237920	159932	41633	55174	175509	8453	221014	123051	149118	14834	25374	2263	2230
4	4370	10766	183211	82221	28413	29940	96269	4350	120710	63930	69630	14091	24841	2009	2508
8	2512	7477	106427	48261	13247	15225	59403	1900	65305	30979	39246	8872	18725	1015	1349
8	505	1167	23923	7950	2385	2504	9823	360	10263	5144	3537	1611	3078	203	246
24	1055	2583	41968	8406	3881	4115	12981	315	10572	8819	1243	3909	8083	253	359
24	636	1594	38292	6318	2640	2645	8634	196	6538	5131	698	3143	3979	162	291

18	14	18	16	18	14	14	18	18	18	16	16	14	16	16
3000	3000	2000	3000	3000	1000	1000	2000	3000	1000	3000	1000	1000	2000	3000
4.5	3	2.25	3	3.75	1.5	3.75	4.5	2.25	1.5	0.75	4.5	3.75	2.25	1.5
Nano_24	Nano_25	Nano_26	Nano_27	Nano_28	Nano_29	Nano_30	Nano_31	Nano_32	Nano_33	Nano_34	Nano_35	Nano_36	Nano_37	Nano_38
48029	59261	69211	50832	29264	240405	131598	33360	46058	61466	56697	59359	110817	53059	40555
44196	22950	65738	48792	26064	207055	71696	30243	44331	53607	46884	55740	57967	53674	37485
66872	81057	104103	75218	45099	388283	237633	56750	69376	129635	87836	91860	179186	88846	67259
27860	37788	40678	32239	17700	140787	83924	20048	28435	52162	37417	39627	73997	32881	26037
49874	1801	69065	25687	26647	59522	14600	30090	46596	42624	40830	40296	10659	33785	27645
79603	2893	113419	52365	46110	88088	23216	51950	79055	84462	70767	73927	15641	71093	53569
76716	2731	127158	47545	47054	95269	25520	54700	80216	122575	72610	72297	16854	65446	49556
62440	5991	77596	40066	33498	57652	21415	36696	51646	57004	46087	50579	17032	45941	35706
64884	1208	107094	4136	38774	47359	10500	50481	55699	77556	38056	18308	7068	9511	13197
99479	1689	181129	7521	63302	83019	20588	86219	88371	176582	66642	35695	11983	18605	23113
82450	2304	134594	4136	53001	107143	26010	69760	65183	174738	64643	25419	19059	12108	19672
94245	4126	141691	6190	72631	133439	34509	83221	72281	249299	90637	34169	24838	17534	28461
110540	1207	217452	3794	65900	77413	14461	110956	100189	190557	52620	19171	9080	12005	19166
47426	1450	72939	2098	35354	70390	12437	39227	34568	120717	37034	14820	9306	6390	10870
22978	731	31746	950	20702	58903	8350	22056	16291	71080	21743	7053	6000	2908	5429
1832	132	3309	173	1940	8382	1539	2008	1758	14933	3698	1131	1183	501	957
820	208	1501	178	1862	26480	3484	542	969	22742	5349	1683	2747	628	1099
523	130	669	141	1360	15562	2733	346	514	16038	2993	1023	2491	302	738