Table S1: Summary of the batch's functionalization

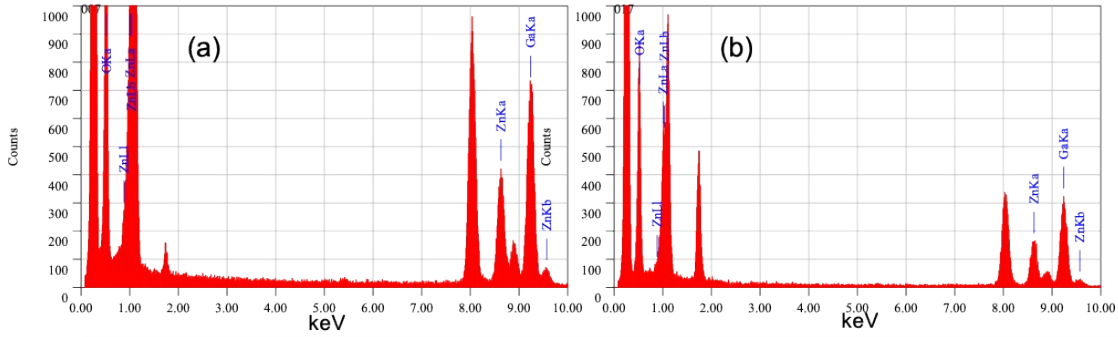
Table S2: Compositions and pH Artificial Lysosomal Fluid (ALF).

Figure S1: STEM-EDX analysis of ZGOOH in ALF at (a) t0 and (b) d90. Table (c) represents mass percentage of each elements (mean and standard deviation, or stdv) obtained on different observations (n=10). Mass percentage of Cr has not been investigated because of its low initial concentration and the detection limits of the EDX detector.

Figure S2: Evolution of ion release rate of ZGOOH in (A) acetate buffer and (B) in milli-Q water, and ZGOPEG in (C) acetate buffer and (D) in milli-Q water. Quantification of release/degradation percentage, defined as the Ga, Zn or Cr mass in the aqueous media normalized to their respective mass in the initial NPs, was made by ICP-AES analysis

Figure S3: Comparison of the area population of ZGOPEG and ZGOOH in acetate buffer, (a) and (b) respectively, and in milli-Q Water (c) and (d) respectively, at t0 and d90. Kolmogorov-Smirnov statistical test has been used to determine the signification of the results (ns: $p>0.1$, *: $p<0.1$, **: $p<0.01$, ***: $p<0.001$, ****: $p<0.0001$).

Figure S1:



(c)

	t0			m3		
	Ga	Zn	O	Ga	Zn	O
mean	52,0	21,9	26,1	53,3	22,3	24,4
stdv	1,6	1,1	1,9	3,1	1,8	2,9

Figure S2:

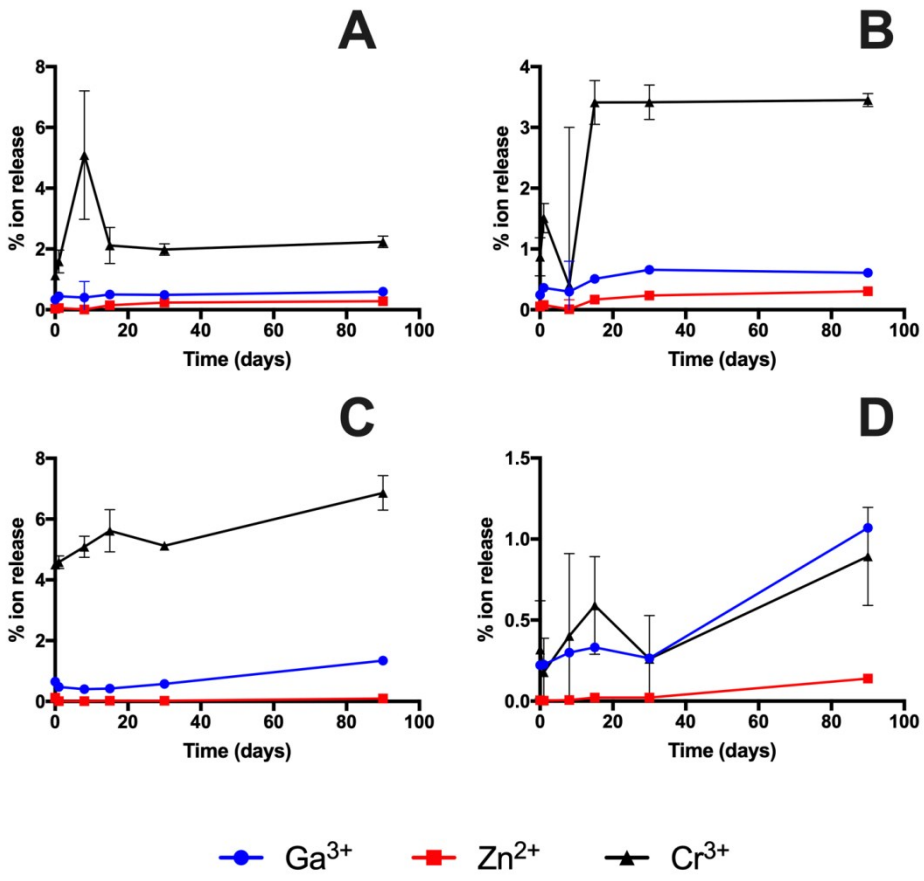


Figure S3:

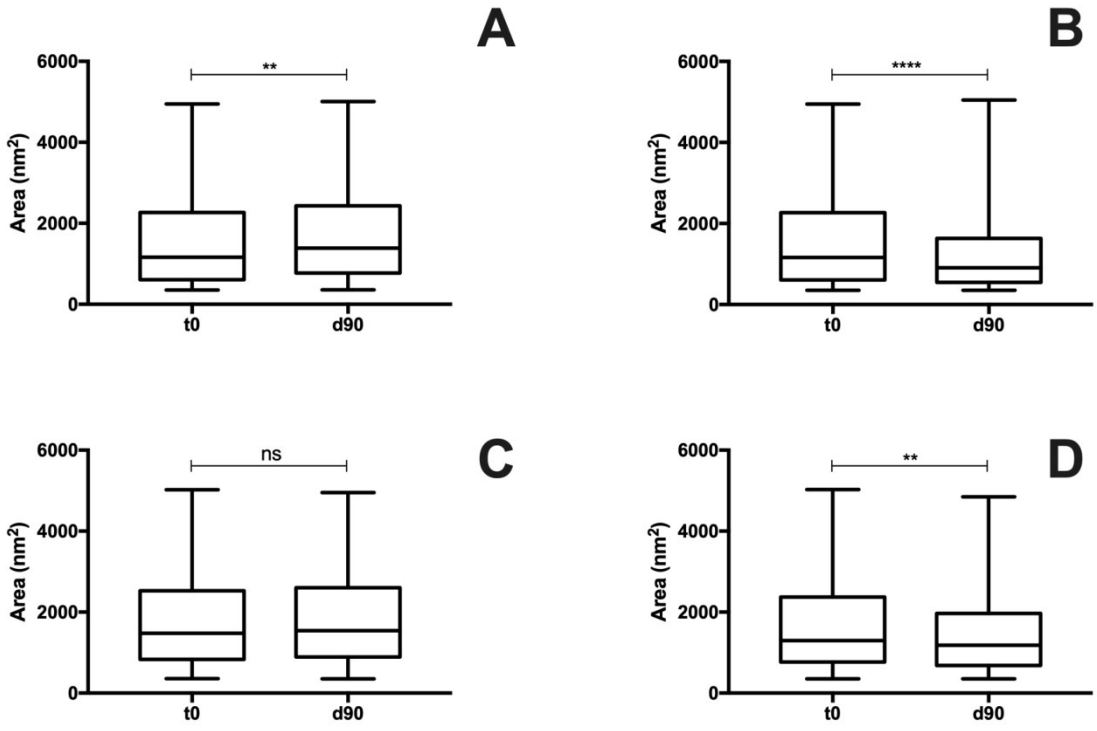


Table S1:

Lot	ZGOOH				ZGONH2				ZGOPEG			
	HD (nm)	pdI	ZP (mv)	conductivity (mS/cm)	HD (nm)	pdI	ZP (mv)	conductivity (mS/cm)	HD (nm)	pdI	ZP (mv)	conductivity (mS/cm)
1	83,43±2,25	0,15	-5,54	2,54	173,97±4,18	0,1	27,1	2,85	156±3,59	0,10	-1,85	3,01
2	100,08±2,67	0,2	-2,55	2,83	169,73±2,70	0,10	29	2,82	129,87±4,74	0,09	-2,45	3,02
3	81,03±2,09	0,12	3,11	2,81	159,87±3,31	0,08	23,2	2,84	165,2±4,51	0,11	-2,34	2,92
4	79,87±2,38	0,12	4,14	2,85	166±5,65	0,11	27,6	2,84	143,87±2,52	0,07	-1,97	3
5	89,32±0,45	0,15	2,61	2,79	174,1±1,90	0,15	31,3	2,81	141,47±2,63	0,13	-1,77	2,83
6	82,94±1,22	0,12	4,49	2,81	155,33±3,67	0,11	26	2,84	129,10±2,95	0,13	-4,66	3,15
7	93,1±2,89	0,12	-8,78	2,98	143±2,29	0,09	17,7	2,8	131,77±2,70	0,13	-3,36	2,9
8	86,63±2,47	0,10	4,53	2,8	156,70±2,43	0,09	27	2,82	194,27±1,46	0,16	-1,88	2,83
9	114,30±15,60	0,29	6,83	2,79	177,90±1,18	0,10	30,8	2,75	162,07±3,43	0,10	-3,2	2,88
10	91,45±7,79	0,18	11,2	2,8	157,60±0,53	0,13	25,8	2,74	128,40±1,66	0,10	-3,19	2,83
11	87,61±1,36	0,15	7,13	2,86	172,90±2,52	0,11	22,7	2,76	126,93±0,60	0,14	-3,7	2,85
12	89,92±5,08	0,19	7,6	2,79	184,33±2,82	0,16	23,9	2,77	143,87±0,91	0,11	-3,65	2,87
13	84,65±0,44	0,13	-0,472	2,76	186,43±1,32	0,12	29,4	2,75	150,20±1,40	0,12	-4,97	2,82
14	88,78±3,60	0,16	13,3	2,76	146,40±1,42	0,13	23,8	2,78	111,73±1,37	0,14	-3,36	2,78
15	84,28±0,72	0,14	18,8	2,75	217,30±0,79	0,17	28,7	2,77	120,00±3,08	0,14	-4,13	2,8
16	86,68±0,41	0,13	15	3,22	134,80±2,19	0,13	33,4	2,76	120,33±2,50	0,17	-3,75	2,84
17	81,79±0,79	0,13	5,49	2,76	169,50±1,93	0,12	31,4	2,74	117,63±0,21	0,09	-5,13	2,83
18	83,16±0,35	0,11	5,85	2,74	193,23±1,62	0,13	33,8	2,68	127,93±0,64	0,09	-4,22	2,84
19	84,03±0,80	0,13	6,81	2,7	180,90±3,05	0,18	27,5	2,67	123,10±2,23	0,14	-1,73	2,86
20	92,97±5,62	0,22	13,1	2,68	167,23±0,31	0,13	16	2,75	114,17±1,40	0,10	-3,78	2,84
Mean	88,06	0,15	5,63	2,80	169,47	0,12	26,81	2,78	138,09	0,12	-3,25	2,89
SD	7,99	0,04	6,78	0,13	19,23	0,03	4,67	0,05	20,42	0,03	1,09	0,09

Table S2:

Compositions	Concentration (g/L)
$MgCl_2$	0.050
NaCl	3.210
Na_2HPO_4	0.071
Na_2SO_4	0.039
$CaCl_2\ 2H_2O$	0.128
$C_6H_5Na_3O_7\ 2H_2O$	0.077
NaOH	6.000
$C_6H_8O_7$	20.800
H_2NCH_2COOH	0.059
$C_4H_4O_6Na_2\ 2H_2O$	0.090
$C_3H_5NaO_3$	0.085
$C_3H_3O_3Na$	0.086
pH	4.5