

Supplementary Table 1. The effect of the number of ELP tyrosine residues, ELP MW and concentration on retention radioactivity in FaDu tumor as a function of time post-injection of labeled ELP. These experiments enabled optimization of the ELP formulation to form a long-lasting and stable injectable radioactive depot *in vivo*.

	Concentration (μM)					MW (kDa)			Tyrosine /ELP			
	62.5	125	250	500	1000	25	50	100	1	4	7	
It ($^{\circ}\text{C}$)	26.7	26.27	25.24	24.22	23.82	30.52	25.24	24.27	25.24	22.57	22.27	
Tumor Retention (%ID/Tumor)	0 hr	96.39 = 0.70	98.21 = 4.26	91.30 = 0.97	97.47 = 2.49	91.95 = 1.49	95.53 = 2.81	91.30 = 0.97	92.38 = 4.61	101.01 = 4.14	96.92 = 1.77	100.29 = 1.83
	24 hr	61.35 = 4.72	65.39 = 7.59	73.64 = 6.33	83.37 = 6.48	92.96 = 7.90	55.39 = 6.86	73.64 = 6.33	73.88 = 1.84	52.59 = 6.20	64.75 = 8.20	95.95 = 3.11
	48 hr	44.09 = 6.30	53.29 = 8.22	64.79 = 7.07	74.43 = 7.38	89.53 = 8.00	36.98 = 5.29	64.79 = 7.07	65.74 = 1.32	48.06 = 6.30	60.98 = 8.04	88.29 = 3.46
	72 hr	40.27 = 6.25	51.15 = 8.40	62.40 = 7.24	72.38 = 7.16	89.38 = 7.58	30.81 = 4.09	62.40 = 7.24	61.84 = 1.30	44.10 = 6.30	57.47 = 7.71	83.68 = 4.20
	96 hr	38.52 = 6.06	48.34 = 8.15	58.38 = 7.00	68.29 = 7.36	84.82 = 7.98	22.06 = 4.50	58.38 = 7.00	58.90 = 1.26	41.39 = 6.35	54.83 = 8.19	82.03 = 4.42
	168 hr	15.78 = 3.71	32.06 = 9.22	48.43 = 2.15	62.93 = 8.11	84.20 = 9.08	4.19 = 2.25	48.43 = 2.15	54.82 = 2.10	26.82 = 5.28	52.92 = 7.64	78.89 = 4.16

Note: the ELP used in the three experiments were different: for the effect of ELP concentration, the ELP was ELP4-120-Tyr₁ with a MW of 50 kDa; for the effect of MW, the ELP was ELP4-120-Tyr₁ at a concentration of 250 μM ; and for the effect of number of tyrosine residues per ELP, the ELPs had a MW of 50 kDa at a concentration of 250 μM .