Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Heterogeneous multi-compartmental DNA hydrogel particles through microfluidic assembly for lymphocyte inspired precision medicine

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Table S1. Sequences of the DNA and RNA oligonucleotides.

Acryd: Acrylic phosphoramidite added to oligonucleotides as a 5'-modification

ROXN: ROXN fluorophore (attached to a guanine residue)

BHQ-2: Black Hole Quencher®-2 (attached to a cytosine residue)

CholTEG: CholTEG (attached to a thymine residue)

TAMRA: TAMRA fluorophore (attached to a guanine residue)

Name of oligonucleotide	**Sequence**
Sequence 1 b-a	5'-5Acryd/TTT TTG ATC TCA TCA ACA TCA GTC TGA TAA GCT A-3'
Sequence 2 b'-c	5'-/56-ROXN/rGrGrA rGrUrA rCrCrC rUrGrA rUrGrA rGrArU rCTT-3'
Sequence 3 a'-c'	5'-TCA GAC TGA TGT GGG TAC TCC/3BHQ_2/-3
Sequence 3' a'-c'	5'-TCA GAC TGA TGT GGG TAC TCC-3'
Sequence 4 d'-b'	5'-TAG CTT ATC AGA CTG ATG TTG ATG-3'
Sequence 5 b-c'	5'-rGrArU rCrUrC rArUrC rArGrG rGrUrA rCrUrC rCTT/3CholTEG/-3'
Sequence 5' b-c'	5'-/TAMRA/rGrArU rCrUrC rArUrC rArGrG rGrUrA rCrUrC rCTT/-3'
Sequence 6 c-d	5'-/5Acryd/TTT TTG GAG TAC CCA CAT CAG TCT GAT AAG C-3'
Synthetic miRNA-21 target a'-b'	5'-rUrArG rCrUrU rArUrC rArGrA rCrUrG rArUrG rUrUrG rA-3'

Table S2: The radius and volume of core-shell particles fabricated are summarized here. The core and shell. The core-shell volume ratio was altered from 1:1 to 1:4 by controlling the flow rates.

R:r	V_{core}:V_{shell}	C_{D1}:C_{D2}
√2:1	1:1	1:1
√3:1	1:2	1:0.5
√4:1	1:3	1:0.33
√5:1	1:4	1:0.25

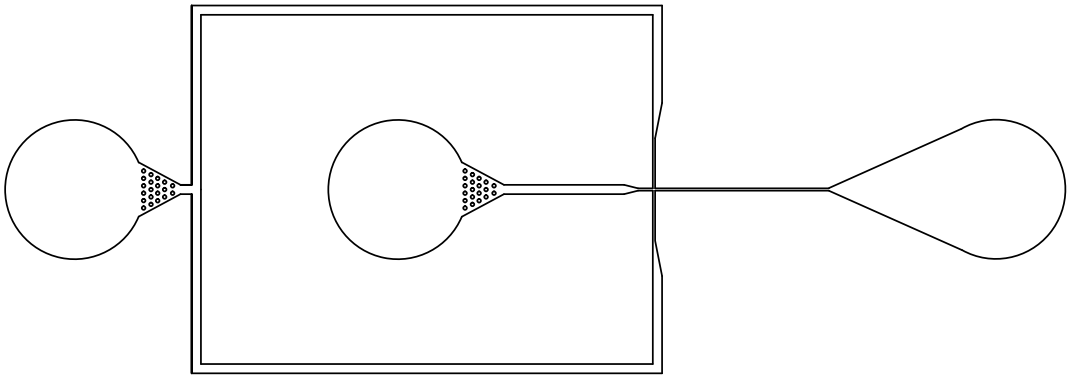

Figure S1. Microfluidic droplet generator to form monodispersed water-in-oil with pre-gel monomers as templates to fabricate the hydrogel particles as the cores in the core-shell hydrogel particles. The dimension of the channel is in the following (W: 25 μm, H: 30 μm).

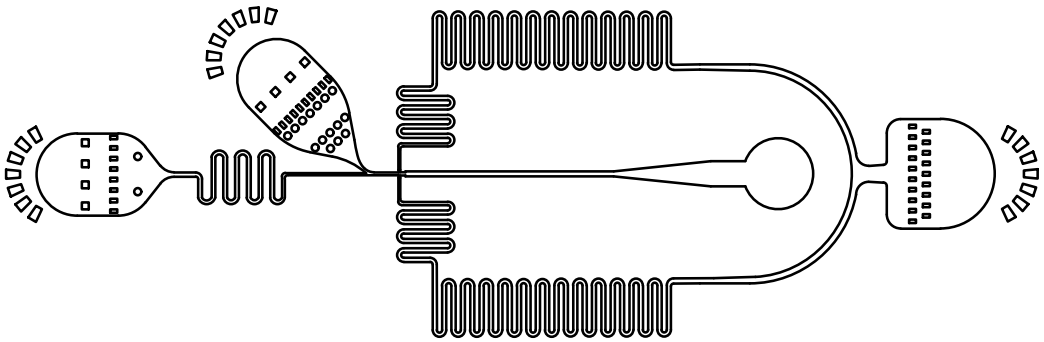

Figure S2. Microfluidic device to produce the pre-gel droplets for core PEG hydrogel particle encapsulation forming core-shell PEG hydrogel particles via polymerization. The DNAs can be compartmentalized into the core and shell accordingly for logical control of siRNA releasing. The channel diameter is indicated here (W: 30 μm, H: 30 μm).