

Supporting Information for:

Development and Characterization of a Novel Poly(N-isopropylacrylamide)-based Thermoresponsive Photoink and its Applications in DLP Bioprinting

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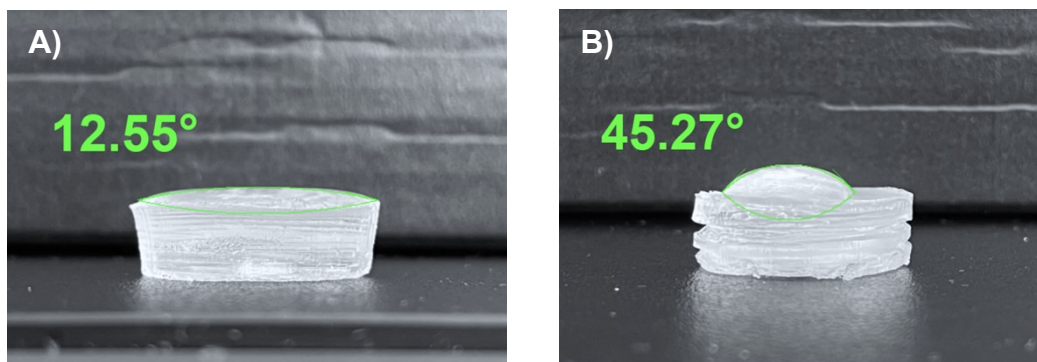


Fig. S1 Contact angle measurements for hydrogels printed using our original formulation (unchanged concentrations of NIPAm and bisacrylamide from our previous work): **A)** 4°C and **B)** 37°C.

Table S1 Formulation and results summary of full factorial experiment 1. All runs were performed in the order indicated by the statistical software, at n=2. (Bis= bisacrylamide, LAP= lithium phenyl-2,4,6-trimethylbenzoylphosphinate, LCST= lower critical solution temperature, Y/N= yes/no).

Run#	[NIPAm] (mg/mL)	[Bis] (mg/mL)	[LAP] (mg/mL)	[Tartrazine] (mg/mL)	Bleaching	LCST (°C)
1	100	4	2	0.25	N	34.9
2	200	8	2	0.1	Y	-
3	100	4	1	0.25	N	33.3
4	200	4	2	0.25	N	40.1
5	200	4	1	0.1	Y	-
6	200	4	2	0.1	Y	-
7	100	8	2	0.1	N	33.1
8	100	4	1	0.1	N	32.2
9	100	8	1	0.1	N	32.9
10	200	4	1	0.25	N	29.7
11	200	8	1	0.1	Y	-
12	100	4	2	0.1	N	34.7
13	100	8	2	0.25	N	32.9
14	200	8	2	0.25	Y	-
15	100	8	1	0.25	N	31.2
16	200	8	1	0.25	Y	-

Table S2 Parameter and results summary of full factorial experiment 2. All runs were performed in the order indicated by the statistical software, at n=2. Highlighted in grey are runs that were not completed (see Results & Discussion).

Run#	Power (%)	Exposure time (s)	Base layer exposure factor (x)
1	44	20	4
2	36	20	4
3	44	16	2
4	36	20	4
5	44	16	4
6	44	16	4
7	36	20	2
8	36	16	2
9	36	16	2
10	36	16	4
11	44	20	2
12	44	16	2
13	36	16	4
14	44	20	2
15	44	20	4
16	36	20	2

Table S3 Formulation and results summary of full factorial experiment 3. All runs were performed in the order indicated by the statistical software, at n=2. (Bis= bisacrylamide, LAP= lithium phenyl-2,4,6-trimethylbenzoylphosphinate, LCST= lower critical solution temperature, Y/N= yes/no). Highlighted in grey is the formulation selected as final for all characterization.

Run#	[NIPAm] (mg/mL)	[Bis] (mg/mL)	[LAP] (mg/mL)	[Tartrazine] (mg/mL)	Bleaching	LCST (°C)
1	100	16	2	0.5	Y	-
2	150	16	2	0.5	Y	-
3	100	8	3	0.5	N	32.1
4	100	16	3	0.5	Y	-
5	100	8	2	0.25	N	34.7
6	150	16	3	0.25	Y	-
7	150	8	2	0.5	N	36.8
8	150	16	2	0.25	Y	-
9	100	8	2	0.5	Y	-
10	150	16	3	0.5	Y	-
11	100	8	3	0.25	N	30.7
12	150	8	3	0.5	Y	-
13	150	8	2	0.25	N	33.8
14	100	16	3	0.25	Y	-
15	100	16	2	0.25	Y	-
16	150	8	4	0.25	N	40.3

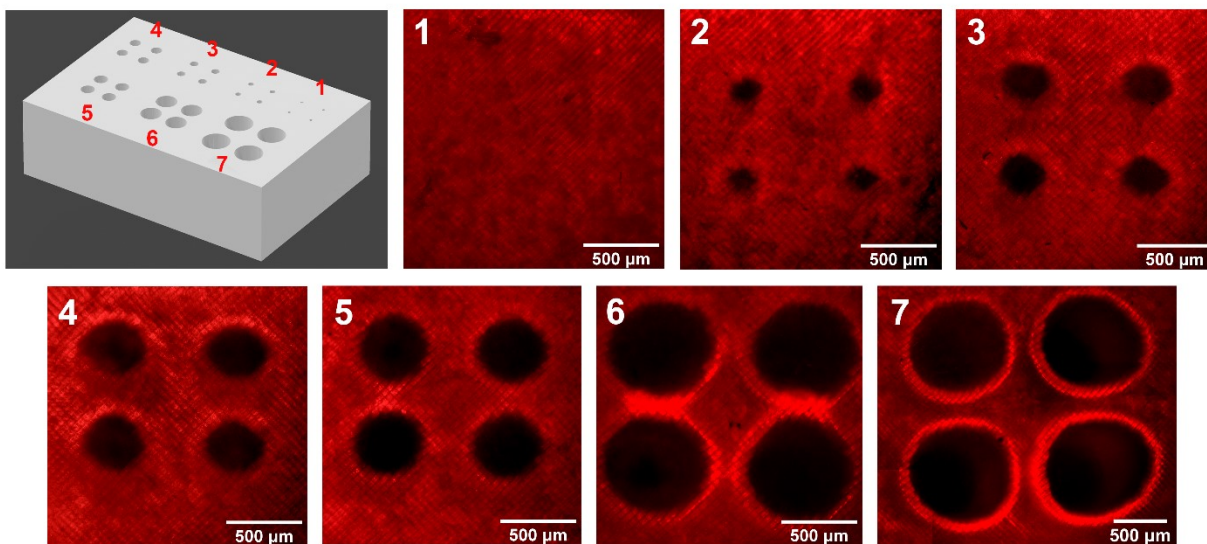


Fig. S2 EVOS fluorescence micrographs of hydrogel with channels of increasing diameter (1= 100 μm ; 2= 200 μm ; 3= 300 μm ; 4= 400 μm ; 5= 500 μm ; 6= 750 μm , 7= 1000 μm). Gel loaded with rhodamine B for increased contrast. Print limit for circular features is 200 μm : note absence of 100 μm channels. All scale bars= 200 μm . (Note: micrograph of 1000 μm channels is a stitched composite, owing to size of wells and microscope's limited imaging field).

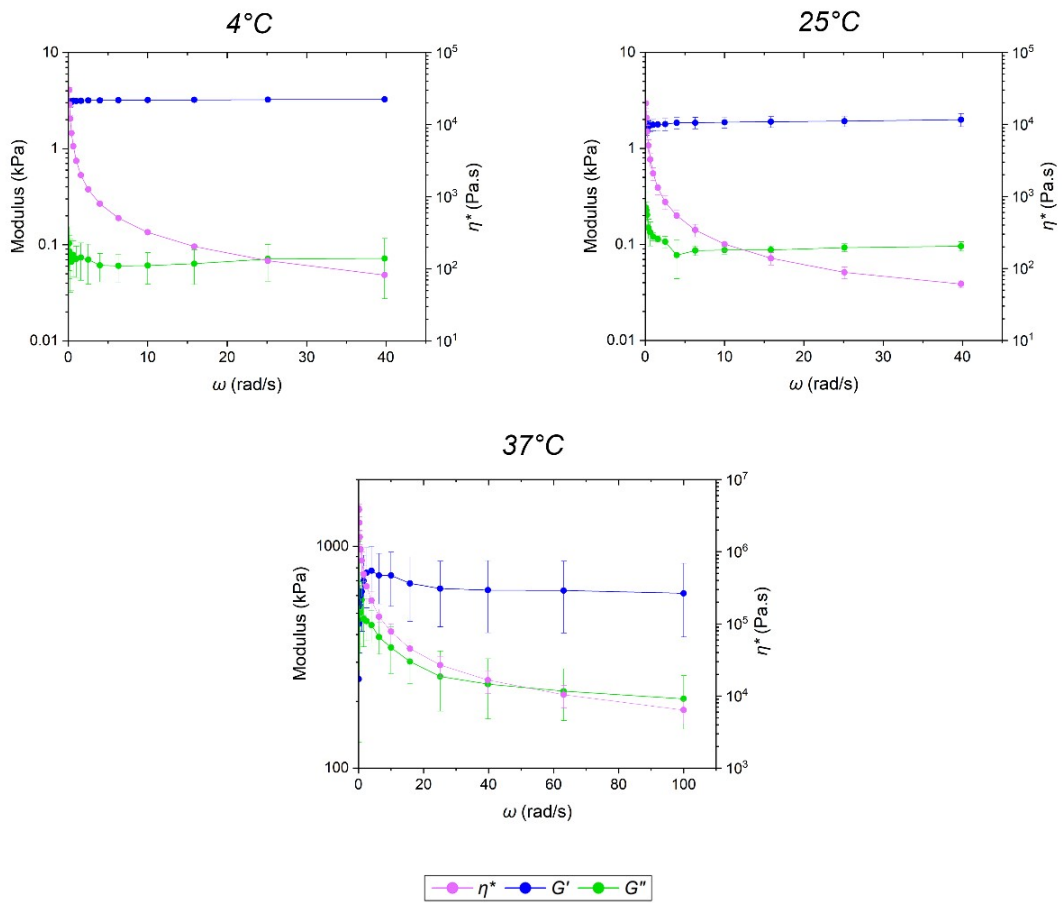


Fig. S3 Mean trends of rheological parameters of PNIPAM discs at different temperatures.

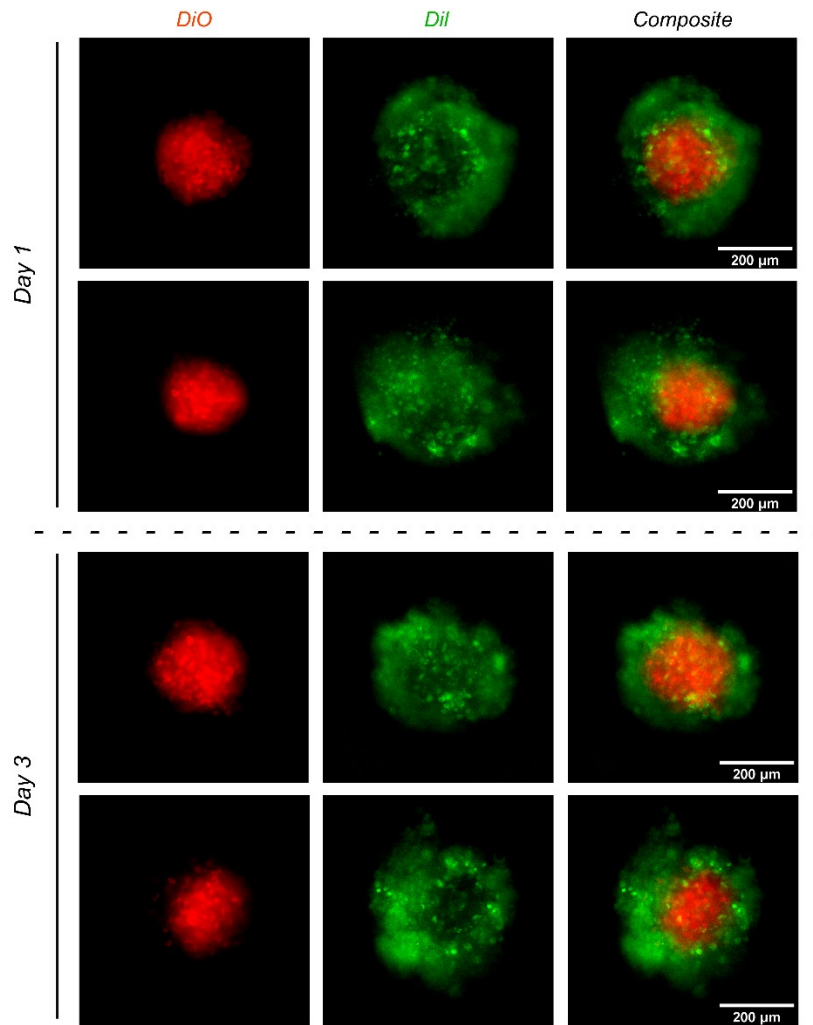


Fig. S4 EVOS fluorescence micrographs of bilayer spheroids, days 1 and 3 (red/inner= HDFs, green/outer= HeLa). All scale bars= 200 μm.