Dynamics of single cell femtosecond laser printing: supplement

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Jet dynamics study of femtosecond laser-induced single-cell printing

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Supplemental document

Table S1. Jet width, velocity and the dimensionless Weber (We) and Reynolds ($\mathfrak{R}$) numbers of cell-free and cell-laden jets in variation of the laser pulse energy and focus depth. Background colors indicate different hydrodynamic regimes from Figure 7 in the main manuscript.

		Cell-free jet			
E_p [μJ]	F_d [μm]	d [μm]	v [m/s]	W_e	R_e
2	26	~10	>100	>1500	>100
0.4	39	12.7±1.0	7.3±0.6	10±2	8±1
2	39	17±3	43±1	458±91	60±12
0.4	52	99±7	1.4±0.4	2.9±1.7	3±0.9
0.8	52	14.5±2.0	5.6±0.8	7±3	7±1
1	52	35±3	7.3±0.2	28±3	22±2
1.2	52	34±1	11.8±0.8	72±9	34±2
1.4	52	30±3	16.4±1.1	118±20	40±5
1.6	52	31±1	17.6±0.8	145±15	46±3
2	52	32±1	17.5±0.5	144±10	46±2
3	52	29±1	33±1	453±35	78±4
4	52	24±3	38±1	536±72	78±11
5	52	18±2	>100	>2700	>150
7	52	- -	>150	>3000	>200
1.4	65	20±4	8.1±1.3	20±7	14±3
2	65	48±2	5.8±0.2	24±1	23±1
2	78	55±5	1.4±0.2	1.6±0.5	6±1
2.3	78	24±1	8.0±0.5	23±3	16±1

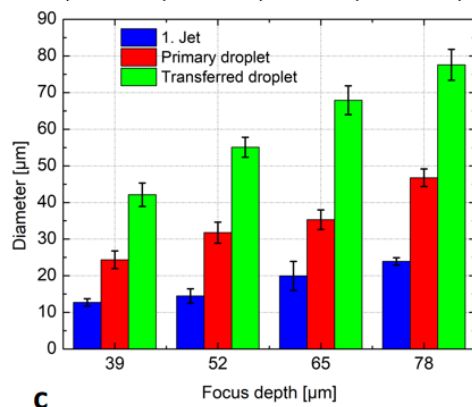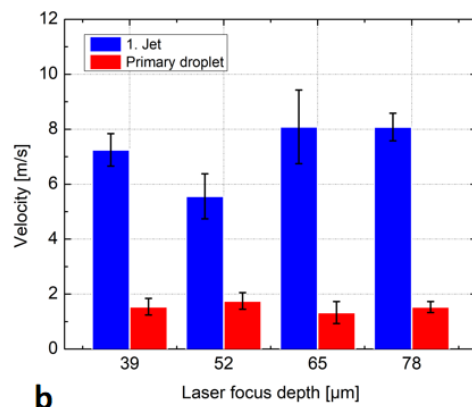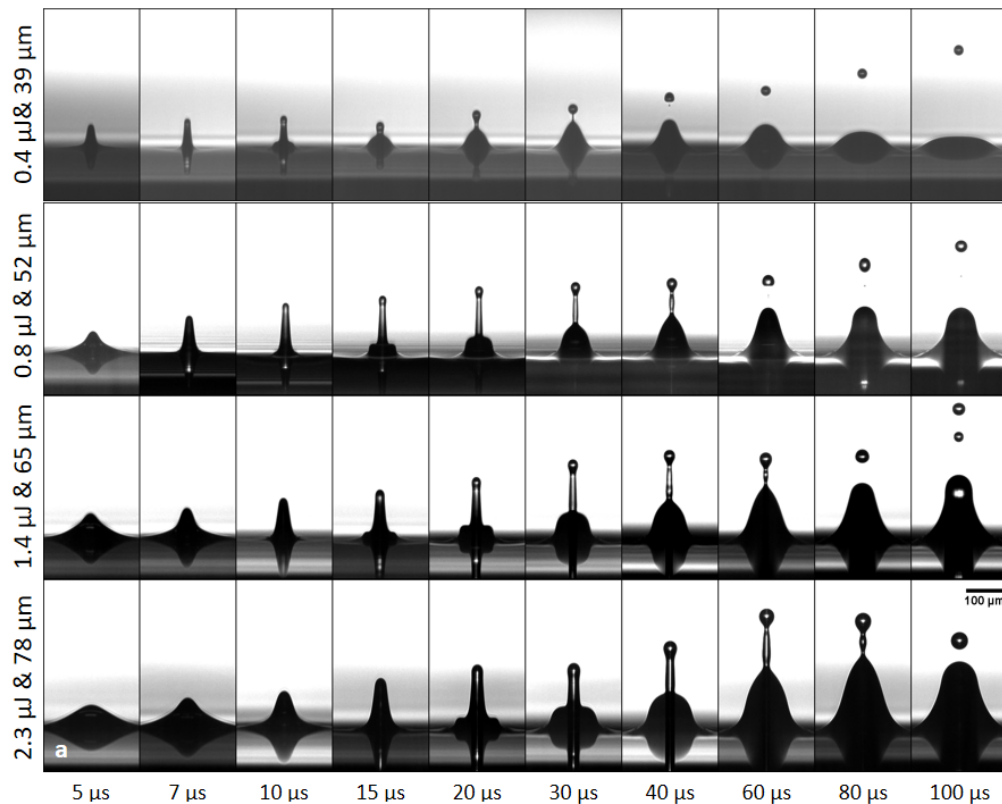| E_p [µJ]	F_d [µm]	Cell-laden jet			
		d [µm]	v [m/s]	W_e	R_e
2	39	17±4	54±7	745±260	78±22
1	52	35±5	6.0±0.7	18±5	17±3
2	52	32±5	21±0.7	195±35	52±9
3	52	28±2	41±3	690±122	95±10
4	52	23±4	48±2	800±130	93±15
2	65	48±1	5.9±0.5	25±4	24±2

Figure S1. (a) Representative time-resolved images of the breakup process of the first jet by applying the threshold energy to the corresponding focus depth of 39 to 78 μm. (b) Plot of the first jet velocity at 10 μs and separated primary droplet velocity and (c) the diameter of first jet width, primary droplet diameter and transferred spot diameter.