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The Emerging Role of Microfluidics in Multi-Material 3D Bioprinting: Supplementary Information

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Table 1 Overview of the capabilities of traditionally used 3D bioprinting methods for single-material printing; extrusion-, droplet-, laser-based and stereolithographic.

	Extrusion-Based	**Droplet-Based**	**Stereolithography**	**Laser-Based**
Mechanism of Deposition	Mechanical/pneumatic forces	Thermal, piezoelectric or electromagnetic forces	Digital light	Laser pulse
Speed [1–3]	Slow:10 – 50 μm/s	Medium:100,000 droplets per second	Fast (Highly material and method dependent)	Fast:200 – 1600 mm/s
Resolution (x- and y-axes) [1–3]	≈ 100 μm	10 – 50 μm	200 nm – 6 μm	10 – 100 μm
Accuracy	Low	Medium	High	High
Cell Density [1,3]	10^8 cells/ml	10^6 cells/ml	$> 10^6$ cells/ml	10^8 cells/ml
Cell Viability [1,3]	40 – 95 %	> 80 %	25 – 85 %	> 95 %
Bioink Viscosity [1–3]	≈ 600 *kPa s*	3 - 12 mPa s	≈ 5 *Pa s*	1 – 300 mPa s
Cost [1,3]	Low-medium	Low	Medium	High
Advantages [1–4]	Ability to use high viscosity bioinks and high cell density	High speed, availability, low cost	High degree of fabrication accuracy, fast	High degree of precision and resolution, high viscosity bioinks and high cell density
Disadvantages [1–4]	Distortion of cell structure	Lack of precision in droplet placement and size, low viscosity bioinks	High intensity UV light, lengthy post—processing, lack of compatible materials	Time consuming, high cost

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