Supplementary Material

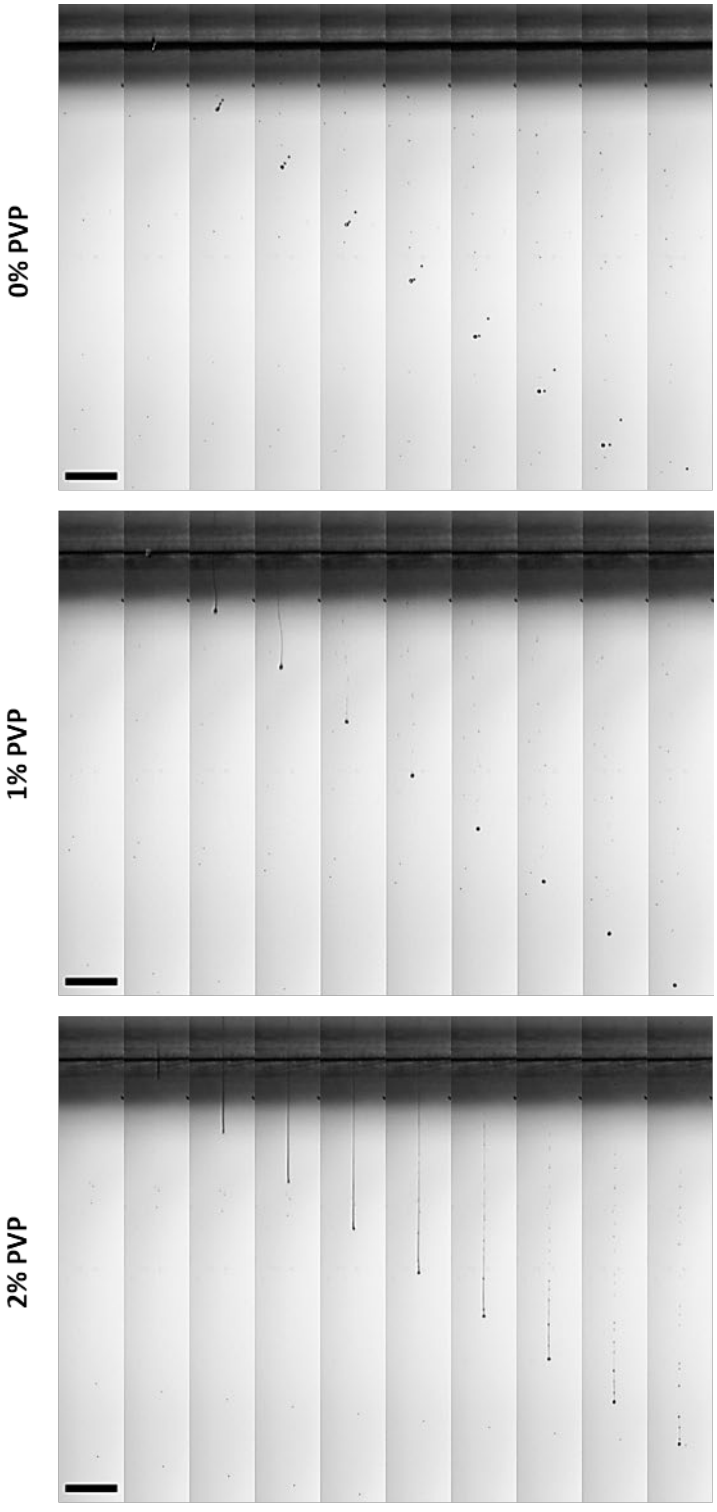

Figure I: Representative images of droplet formation for different PVP-based bio-inks (0 – 2% w/v) near the nozzle orifice were captured at 100,000 frames per second and the images were stacked at 4 frames apart (25,000 frames per second, 40 μs apart). The black scale bar denotes 1 mm.

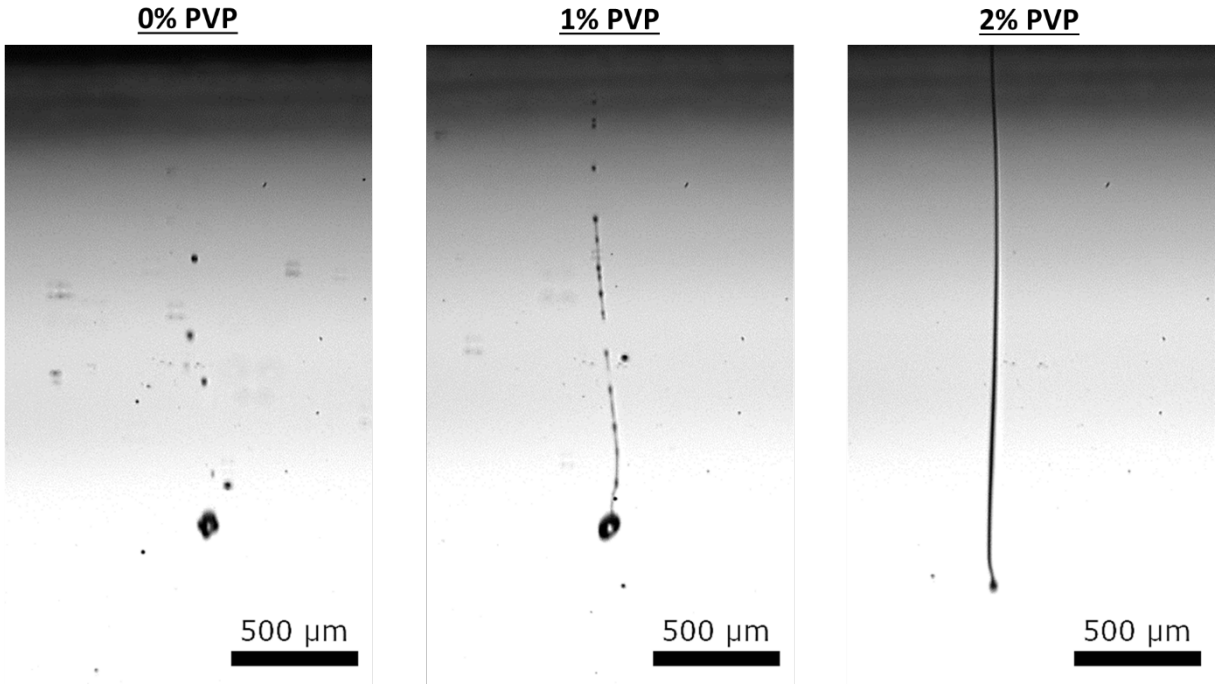

Figure II: Representative images showing individual droplet with 5x lens for different PVP-based bio-inks (0 – 2% w/v).

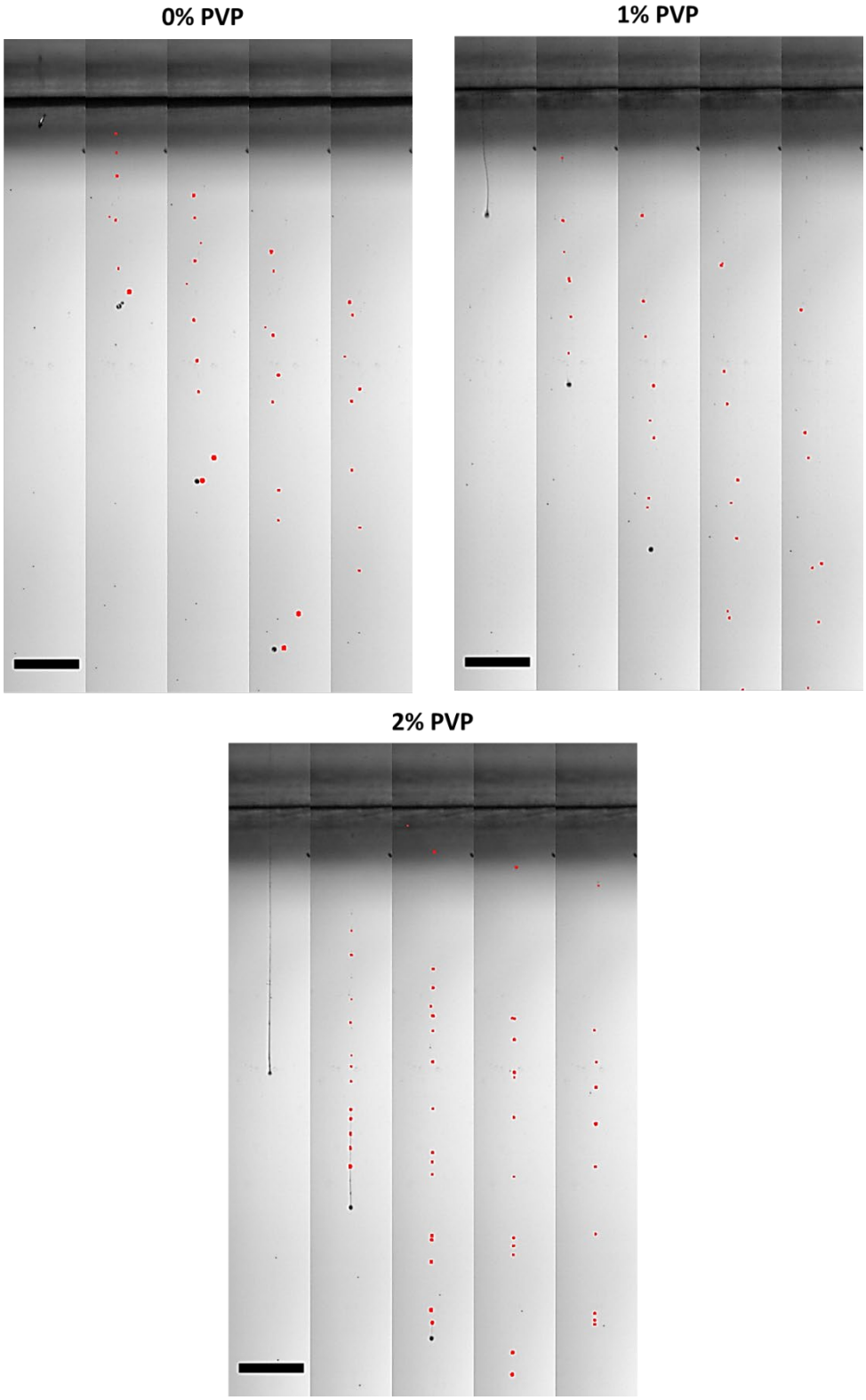

Figure III: Representative images showing number of satellite droplets (highlighted in red) after rupturing from the nozzle orifice for different PVP-based bio-inks (0 – 2% w/v); images were 100 µs apart. The black scale bar denotes 1 mm.

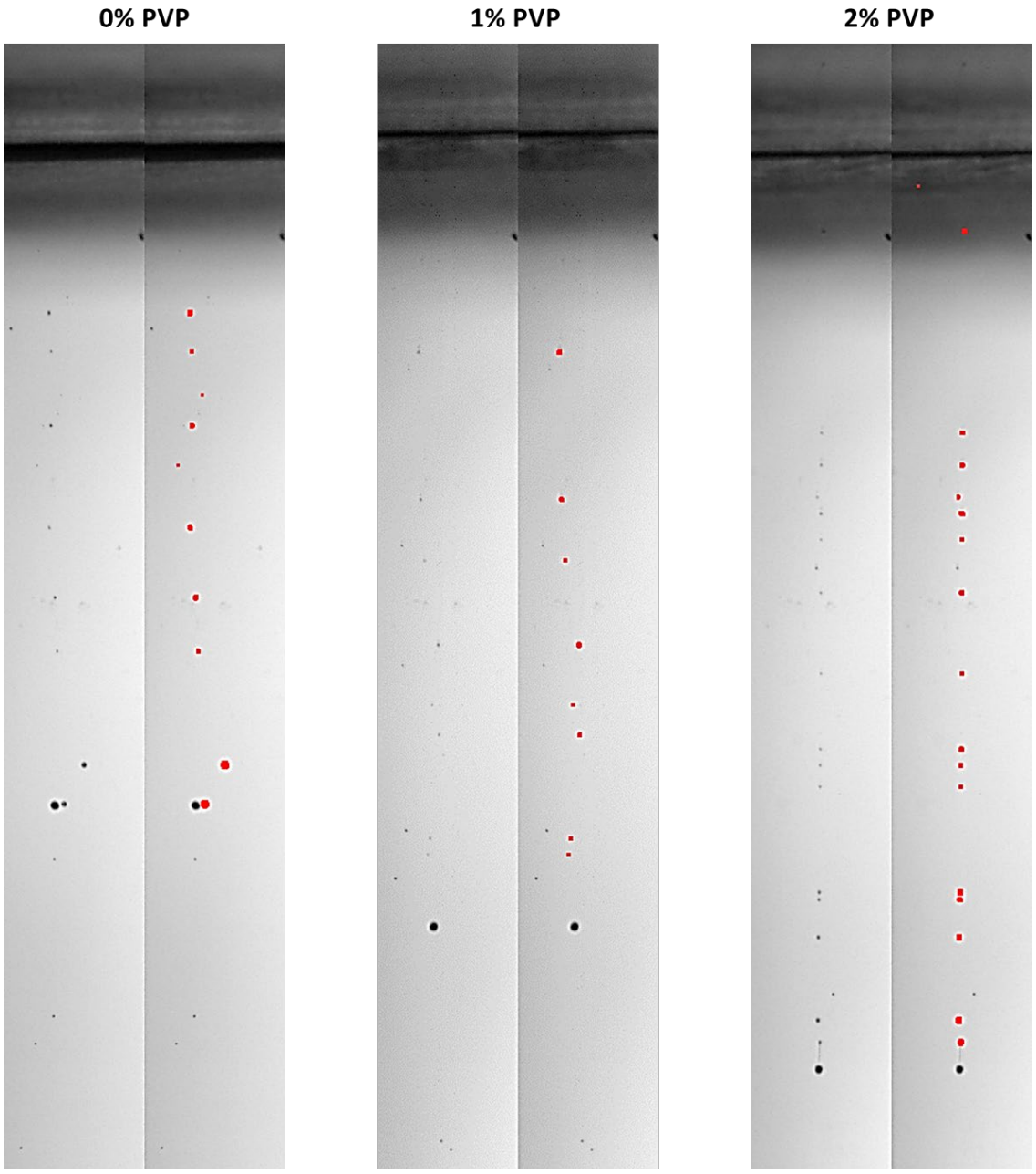

Figure IV: Representative images of original image and images with satellite droplet marked for different PVP-based bio-inks (0 – 2% w/v). The red marker is dilated for a clearer position of satellite droplets.

The thermal inkjet print-head used in this study is capable of printing constant droplet volume of ~0.345 nL and the desired volume at each specific spot can be controlled by manipulating the number of printed droplets. The satellite droplets were significantly smaller than the main droplets and these small satellite droplets tend to evaporate much faster. Hence, the main droplet displacement and droplet splashing has more significant effect on the printing quality.