

Supplementary Information

Passivation by Pyridine-Induced PbI_2 in Methylammonium Lead Iodide Perovskites

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SI 1: 1M and Pbl₂ PL Emissions

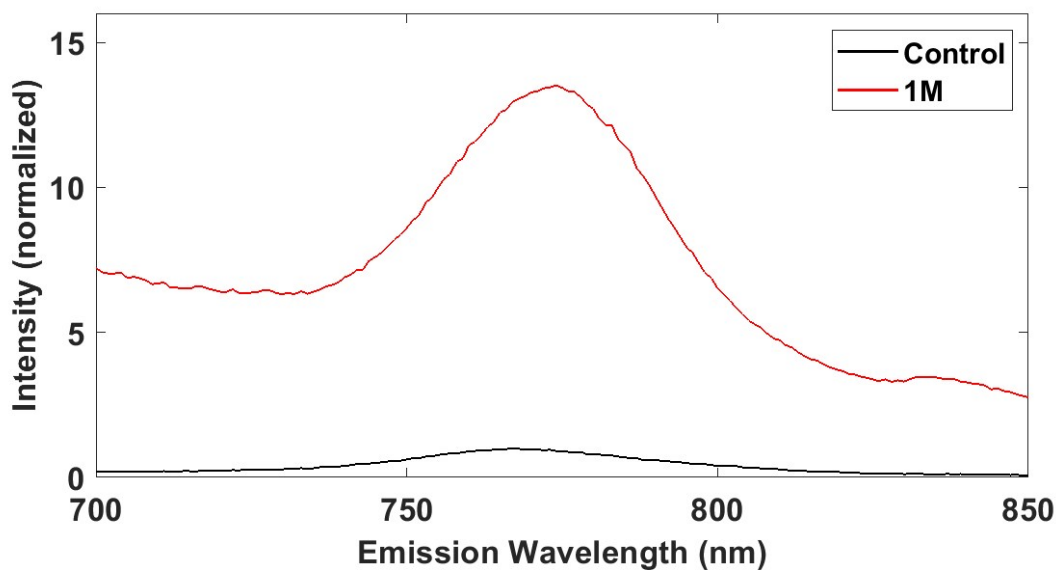


Fig. S1: Photoluminescent emission for the control and 1M pyridine treated perovskite films, normalized to the control film. This shows a 14 fold enhancement in peak intensity, however there is also a large emission across the 700-850 nm spectrum, suggesting a broad range of bandgaps exist, possibly due to 2D perovskites. This is backed up by the 10° peak seen in the XRD patterns.

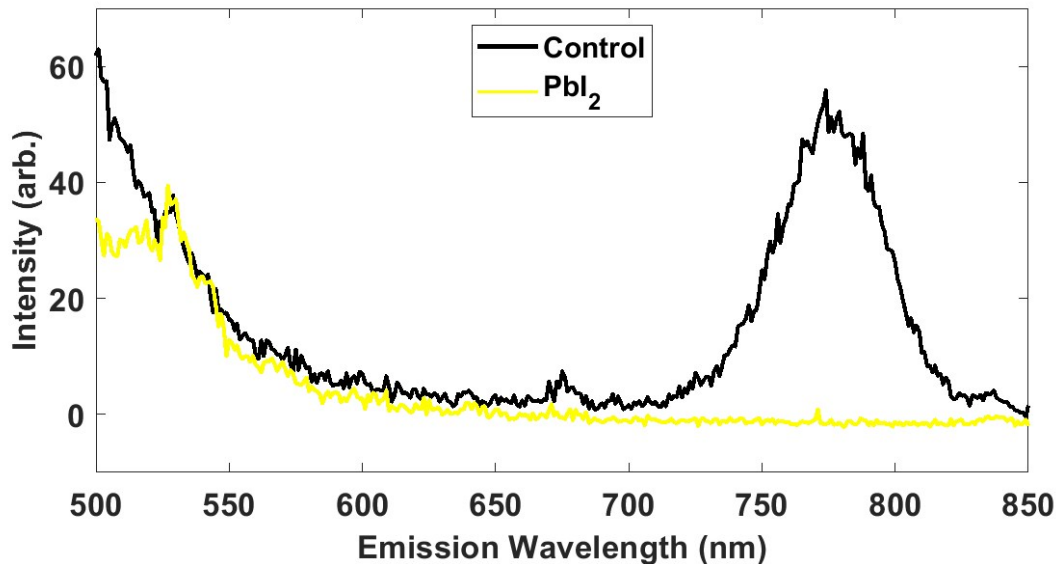


Fig. S2: Broad emission range PL for a MAPbI₃ film fabricated with excess Pbl₂ and a Pbl₂ film centred at 470 nm excitation. This shows an emission peak for the Pbl₂ at 530 nm for both films. There is a background emission from the excitation source approaching 500 nm.

SI 2: AFM Images

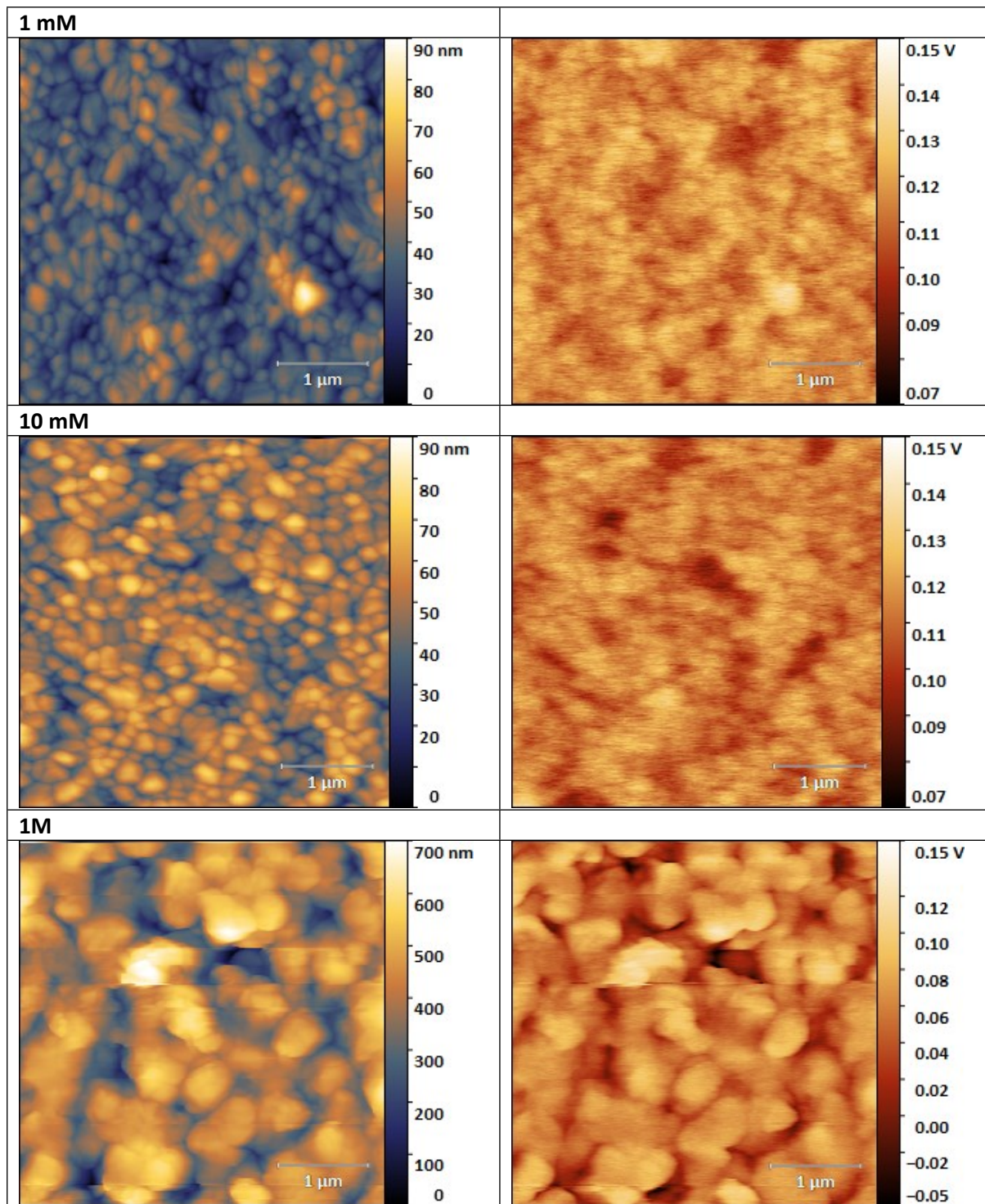


Fig S3 – AFM images for the remaining pyridine treated MAPbI₃ samples. Note the large change in the scale for the 1M treated morphology image.

SI 3: Split CFM Images

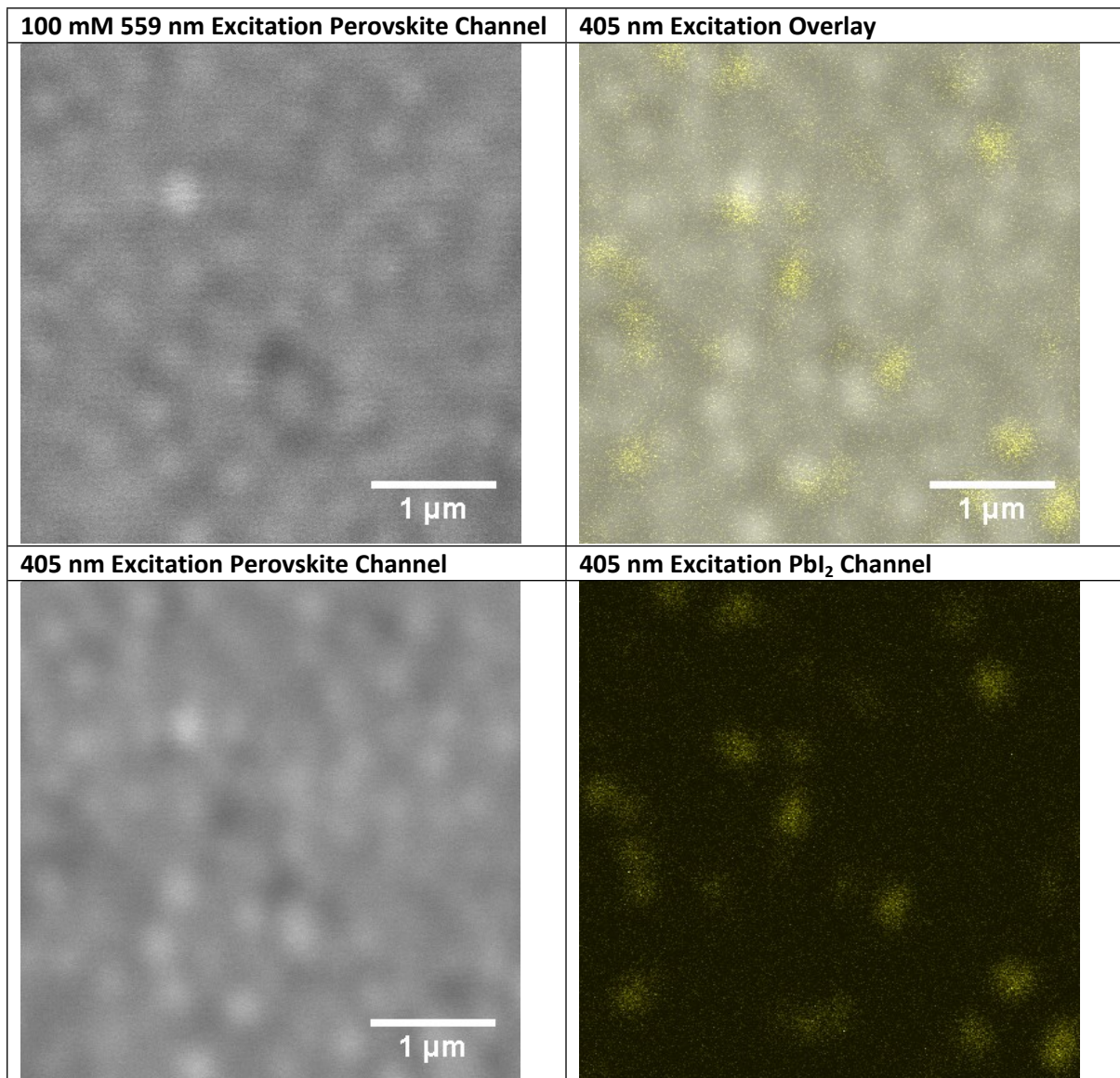
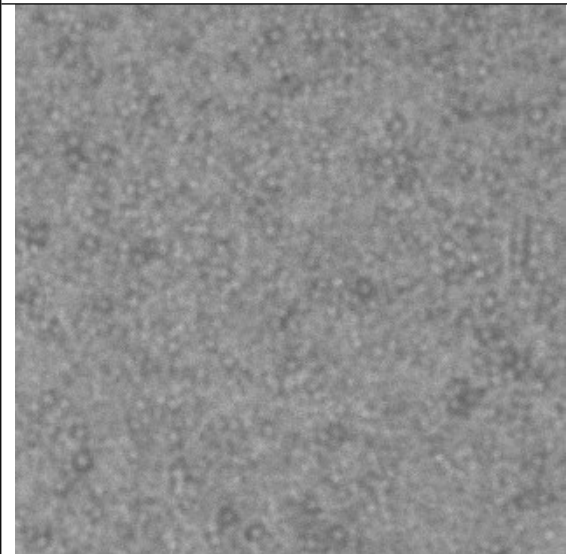
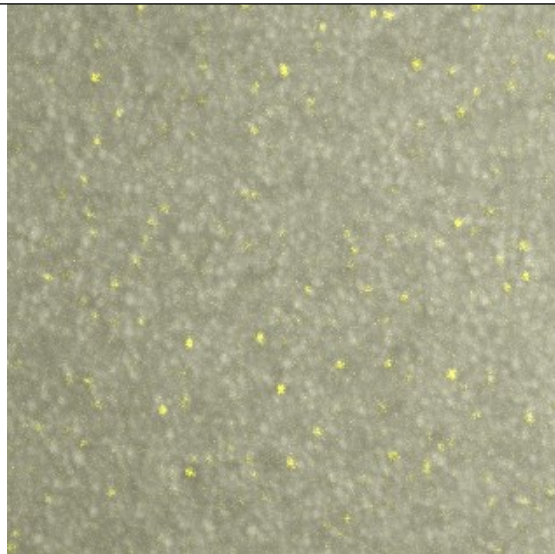
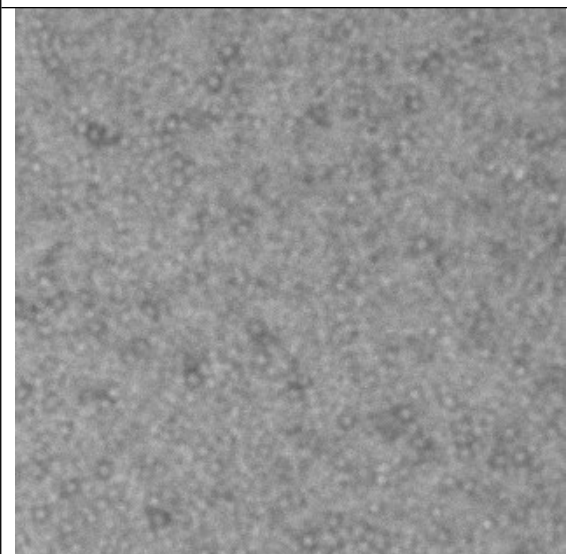
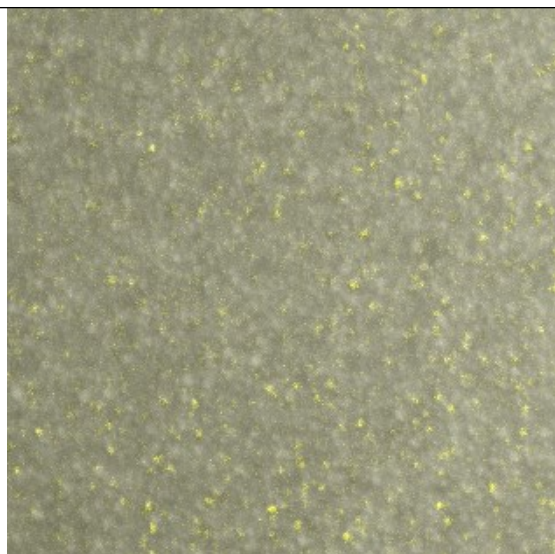
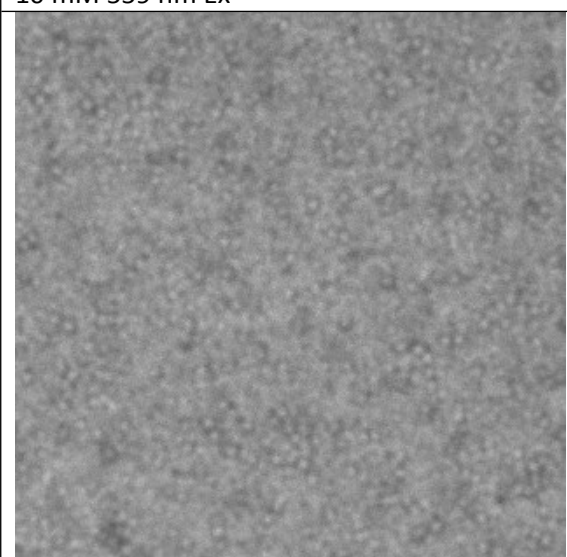
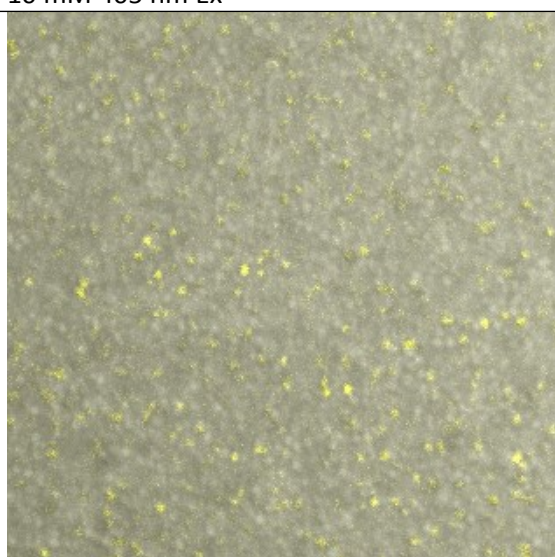


Fig S4 – Separated channel images used to generate the 405 nm excitation overlay for Fig. 4 in the main body.

SI 4: CFM Images of MAPbI₃ Treated with Increasing Concentration of Pyridine in Chlorobenzene.

Control 559 nm Ex	Control 405 nm Ex
	
1 mM 559 nm Ex	1 mM 405 nm Ex
	
10 mM 559 nm Ex	10 mM 405 nm Ex
	

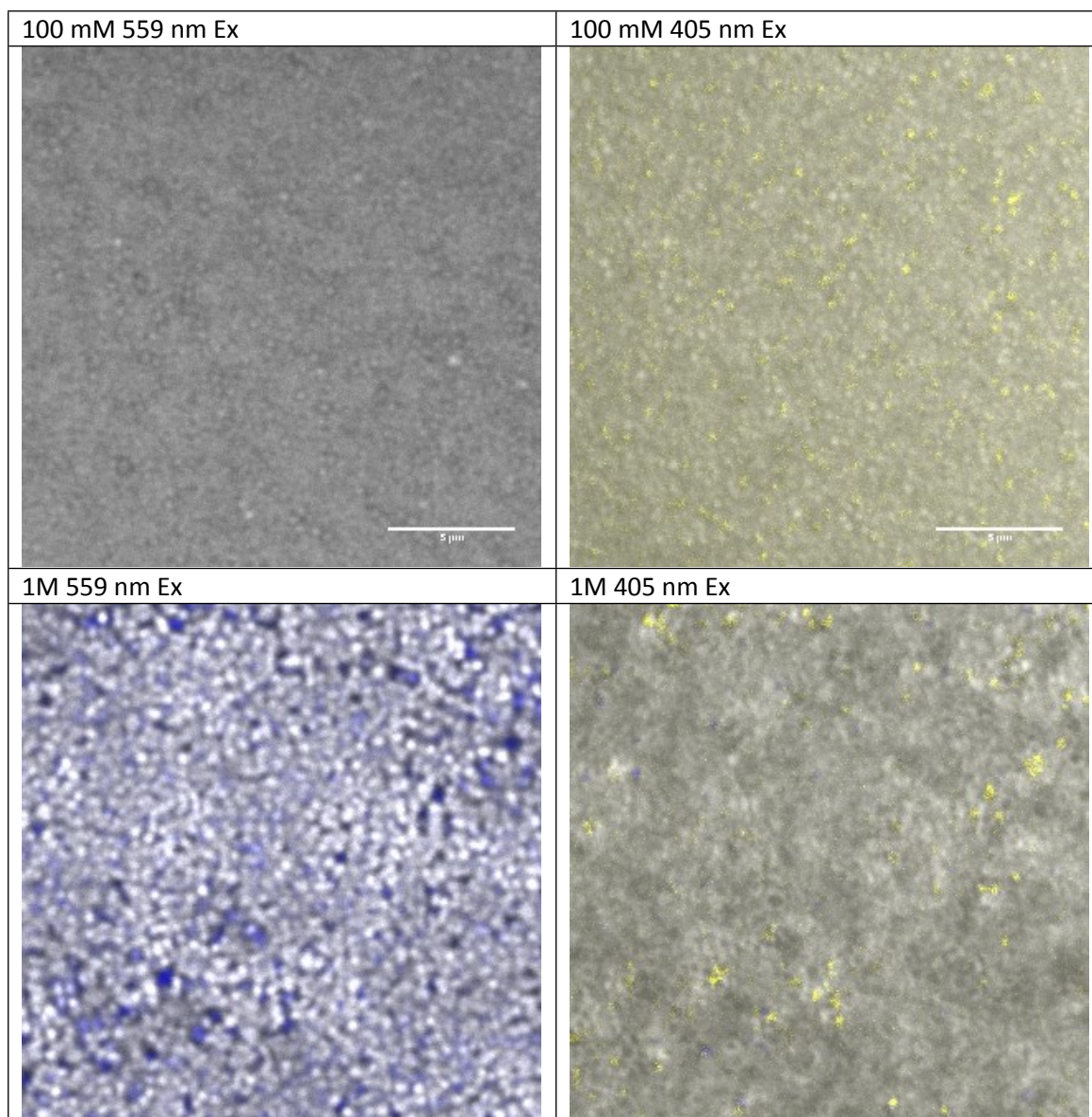


Fig. S5 – CFM images of all the samples used in the study. Colours, grey is the perovskite signal, yellow for the PbI_2 signal and blue for transmitted light. Notably a visible change in structure appears at 1M pyridine treatment with the formation of larger grains and holes (blue). All images are 20x20 μm .