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Supplementary Information

Surface imaging microscopy with tunable penetration depth as short as 20 nm by employing the hyperbolic metamaterials

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1. Surface imaging with and without Mega 520 dye under the BPP illumination

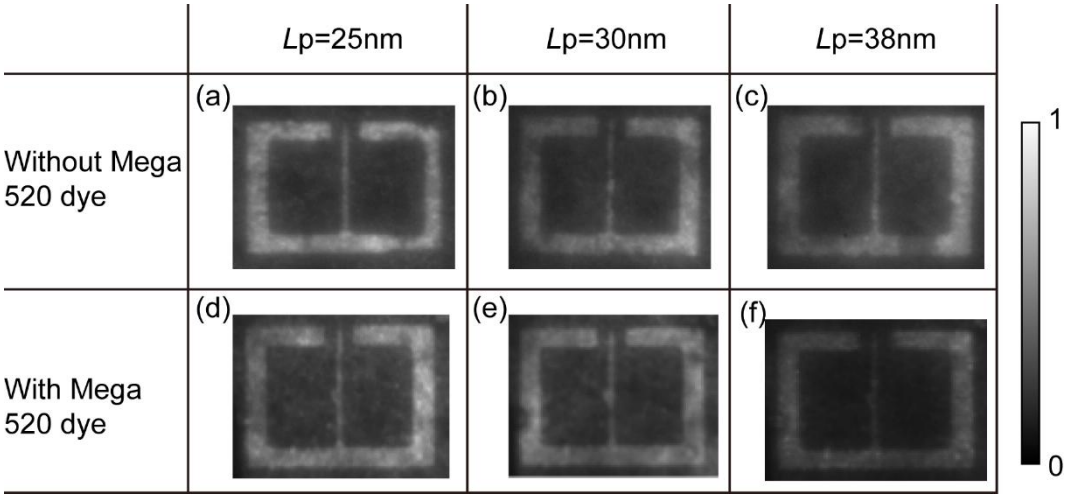

Fig. S1 Images of the fluorescence pattern with and without Mega 520 dye under BPP illumination.

The surface images of Rhodamine 6G/Photoresist pattern are still clear when dropping Mega 520 dye, and this means only a small amount Mega 520 dye is illuminated and background fluorescence is relatively low compared with total internal reflection illumination case. Moreover, under the illumination depth of 25 nm, the image contrast is highest. The speckles on the images result from the film roughness and could be eliminated by improving the fabrication level of nano-films.

2. Surface imaging with total internal reflection method

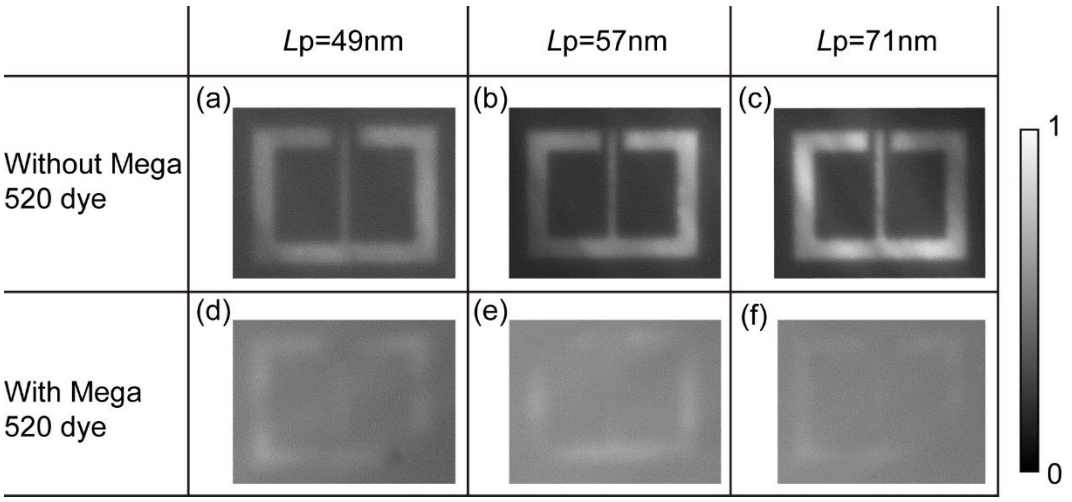

Fig. S2 Images of the fluorescence pattern with and without Mega 520 dye obtained from TIRF experiment.

When the Rhodamine 6G/Photoresist pattern on the bare glass is illuminated by the evanescent wave generated from total internal reflection, the images are well distinguishable and the intensity improves with increasing the illumination depth. Because the thickness of the Rhodamine 6G/Photoresist pattern is about 27 nm and the illumination depth from total internal reflection is always larger than the pattern thickness, the bulk Mega 520 dye on the pattern is illuminated and the surface images blur. In addition, the laser interference effect leads to the nonuniform illumination field.