**Binary self-assembly monolayer (SAM) system**

* For the images, the z-scale are from -0.6 nm to 1.2 nm on the right color bar. The z-scale is linear to the height for all AFM images, the image sizes (x,y) are 500 × 500 nm2
* The image conditions are 512 lines/frame with 512 points per line.
* The sample was prepared using mixture of LPS:OEG-silane (lipopolysaccharides (LPS), 2-[methoxy(polyethyleneoxy)6-9-propyl]trichlorosilane (OEG-silane) ) in solution was 11 : 89 in amount ratio.

LPS molecules are higher than OEG molecues on surface, so the bright dots features could be regonized as LPS molecules. For example, the image sizes are 500 × 500 nm2 . Size of these dot features varied. The height measured 1.4 – 3.5 nm above surroundings and the diameter (FWHM) ranged from 8 to 17 nm. Among all the AFM images of LPS:OEG-SAM, the smallest dot measured around 1.5 nm in height and 8 nm in diameter, suggesting it represented one single LPS molecule on LPS:OEG SAMs. Using this size as reference, we could estimate numbers of LPS molecules per cell (10 × 10 μm2)

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