Dual-action antimicrobial surface coatings: Methylene blue and quaternary ammonium cation conjugated silica nanoparticles

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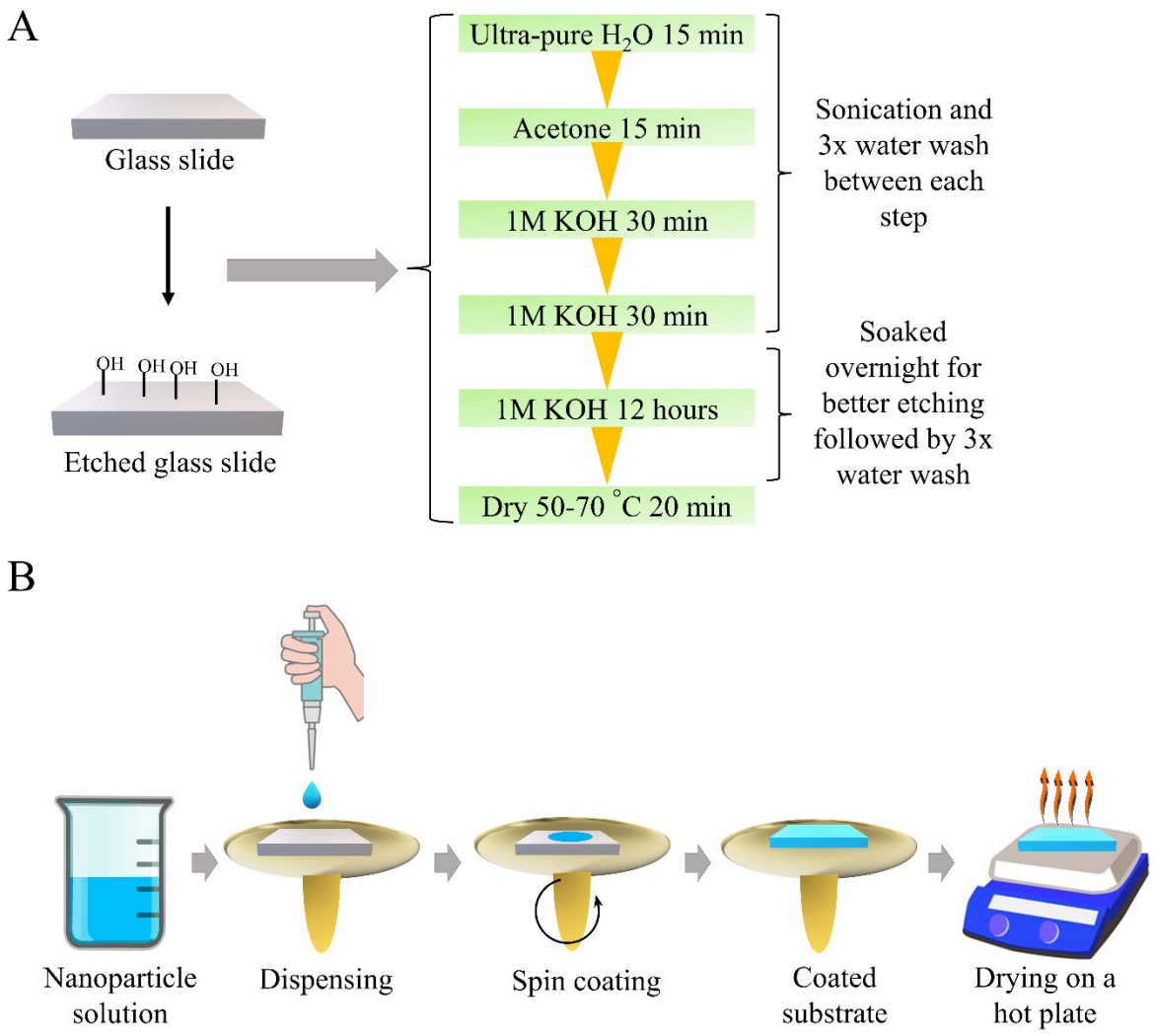
Description:

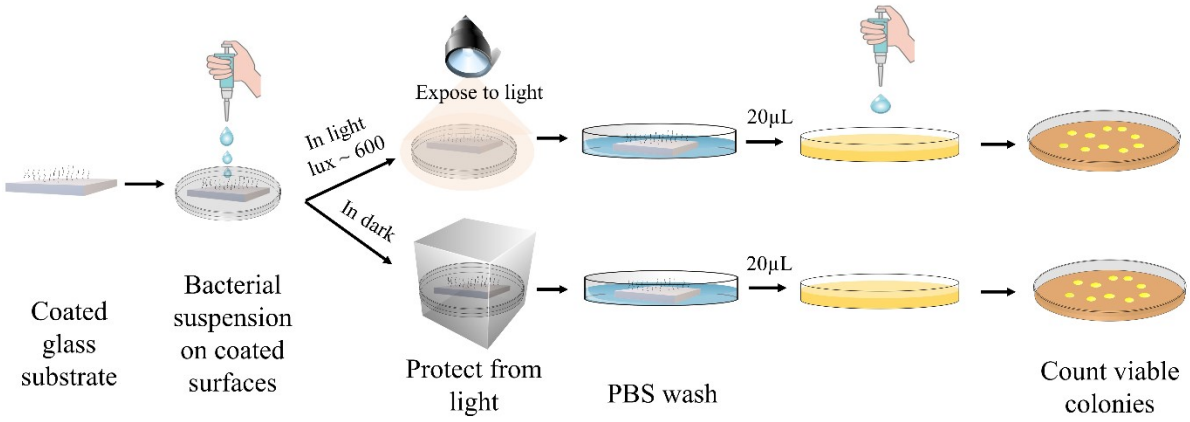
Additional information covering

SFigure 1: The schematic illustration of glass substrate preparation and surface coatings.

SFigure 2: Diagrammatic representation of bactericidal activity test with coated surfaces.



SFigure 1: Substrate preparation and coating: (A) glass substrate preparation by series of cleaning and etching methods to expose hydroxyl groups on the glass surface. (B) Demonstration of series of steps followed during the process of spin coating. ~100 µL of the nanoparticle solution was dispensed over 10 seconds onto a glass substrate spinning at 500 rpm. Then allowed to spread for 20 seconds at 1000 rpm, followed by spin drying at 2000 rpm for 20 seconds. The coated sample was then further dried on a hot plate at 100 °C for 5 minutes. This coating process was repeated three times. After the final coating, the resultant coated glass substrates were left to dry overnight under vacuum at 50 °C.



SFigure 2: Diagrammatic representation of bactericidal activity test with coated surfaces: 30 µL of a bacterial suspension was inoculated onto uncoated and nanoparticle coated glass surfaces. One set of test samples was placed in a petri dish within a humidified chamber at 25 °C under dark conditions, while the other set was exposed to the LED light source with an intensity of ~ 500 lux. After a 30-minute exposure period, bacterial-treated surfaces were rinsed with PBS to collect bacteria. Then 20 µL of the bacterial suspension was subcultured on agar plates to enumerate viable bacteria.