

# Precisely structured nitric-oxide-releasing copolymer brush defeats broad-spectrum catheter-associated biofilm infections in vivo

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## Supporting Information

### Precisely Structured NO-releasing Copolymer Brush Defeats Broad-Spectrum Catheter-Associated Biofilm Infections *In Vivo*

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Keywords: broad-spectrum antibiofilm; antithrombogenic; structured polymer; nitric oxide; surface hydrophilicity

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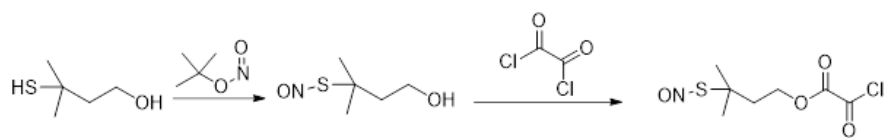
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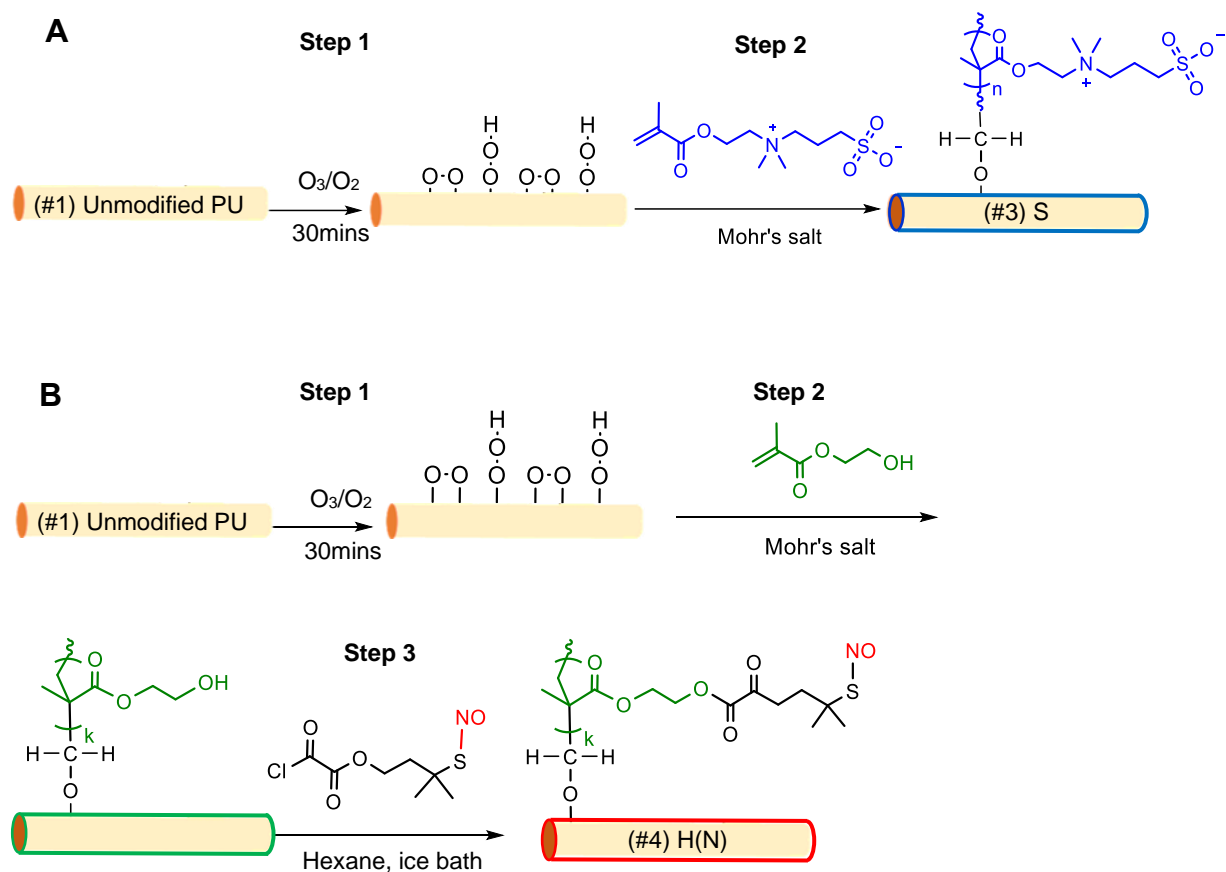
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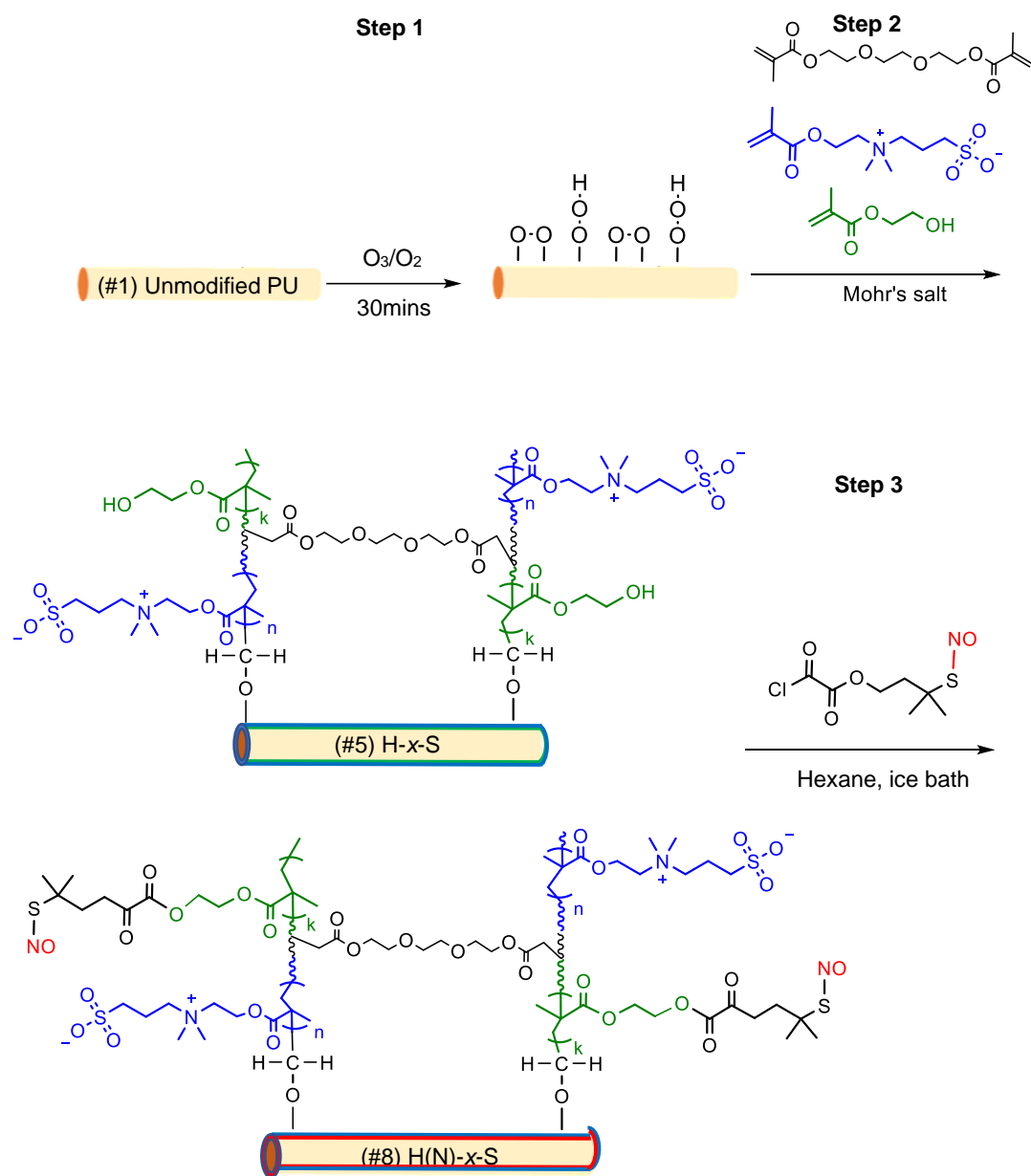
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**Scheme S1.** Synthesis of NO release precursor (NTMB-Cl)

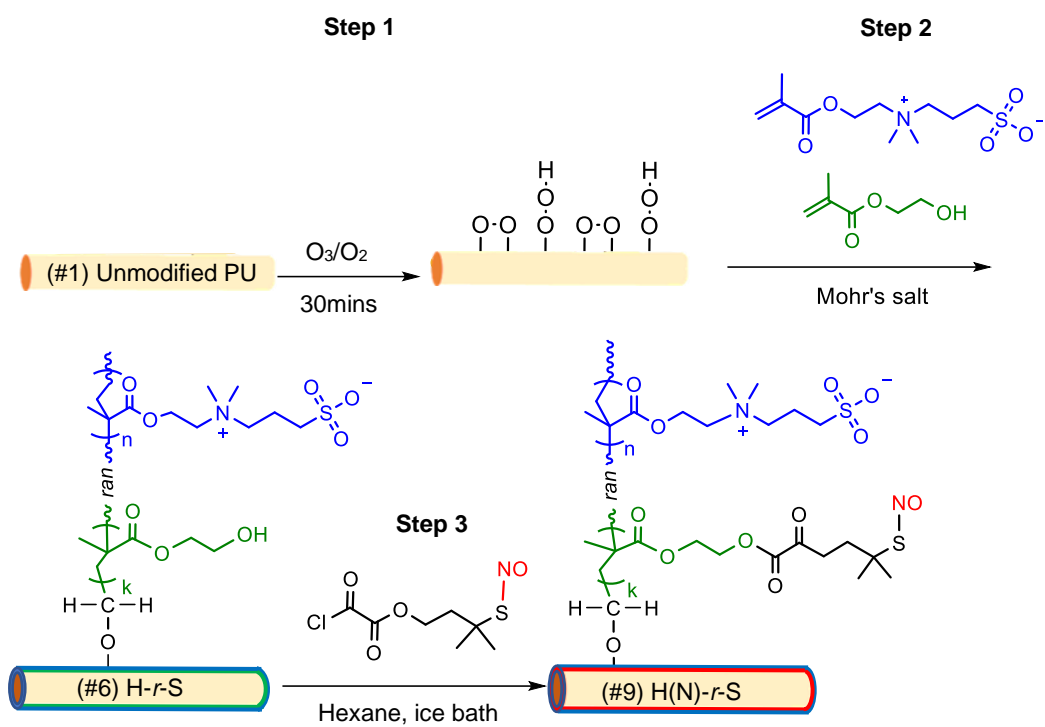


**Figure S1.** Synthesis of **(A)** homo poly(SBMA) coating ((#3) S) and **(B)** homo poly(HEMA-NO) coating ((#4) H(N)).

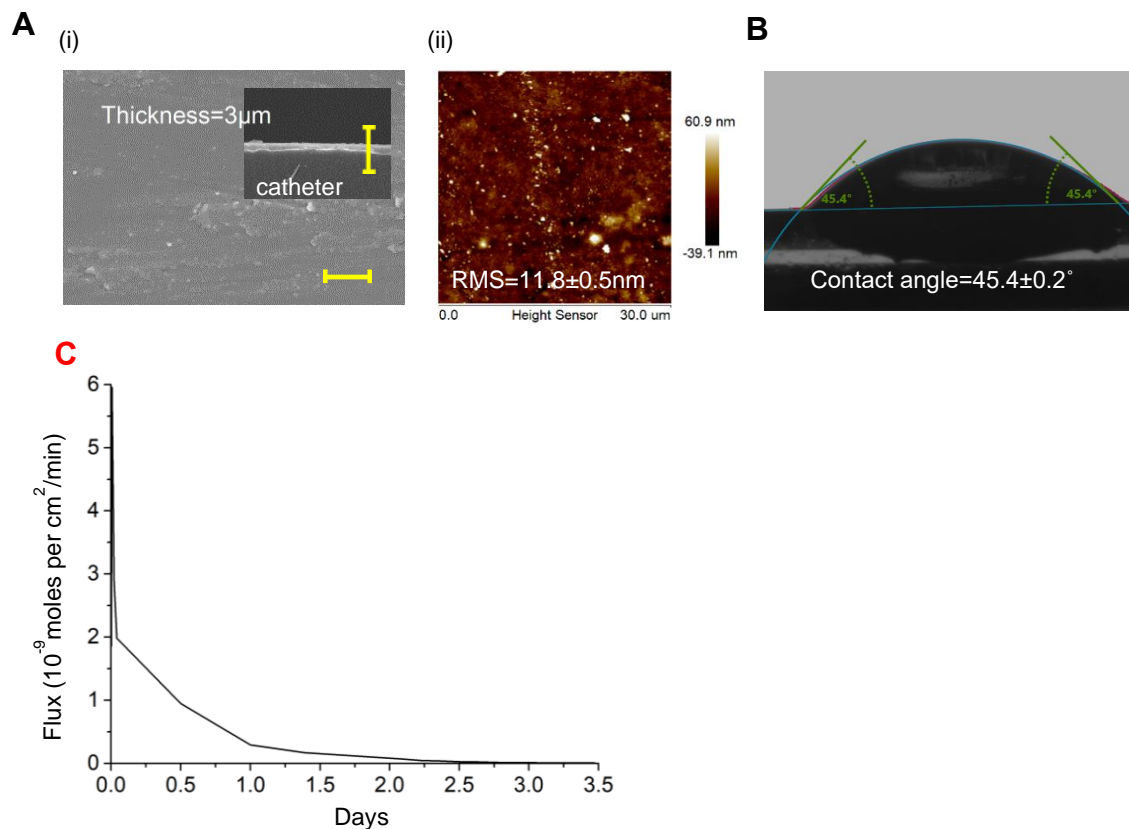


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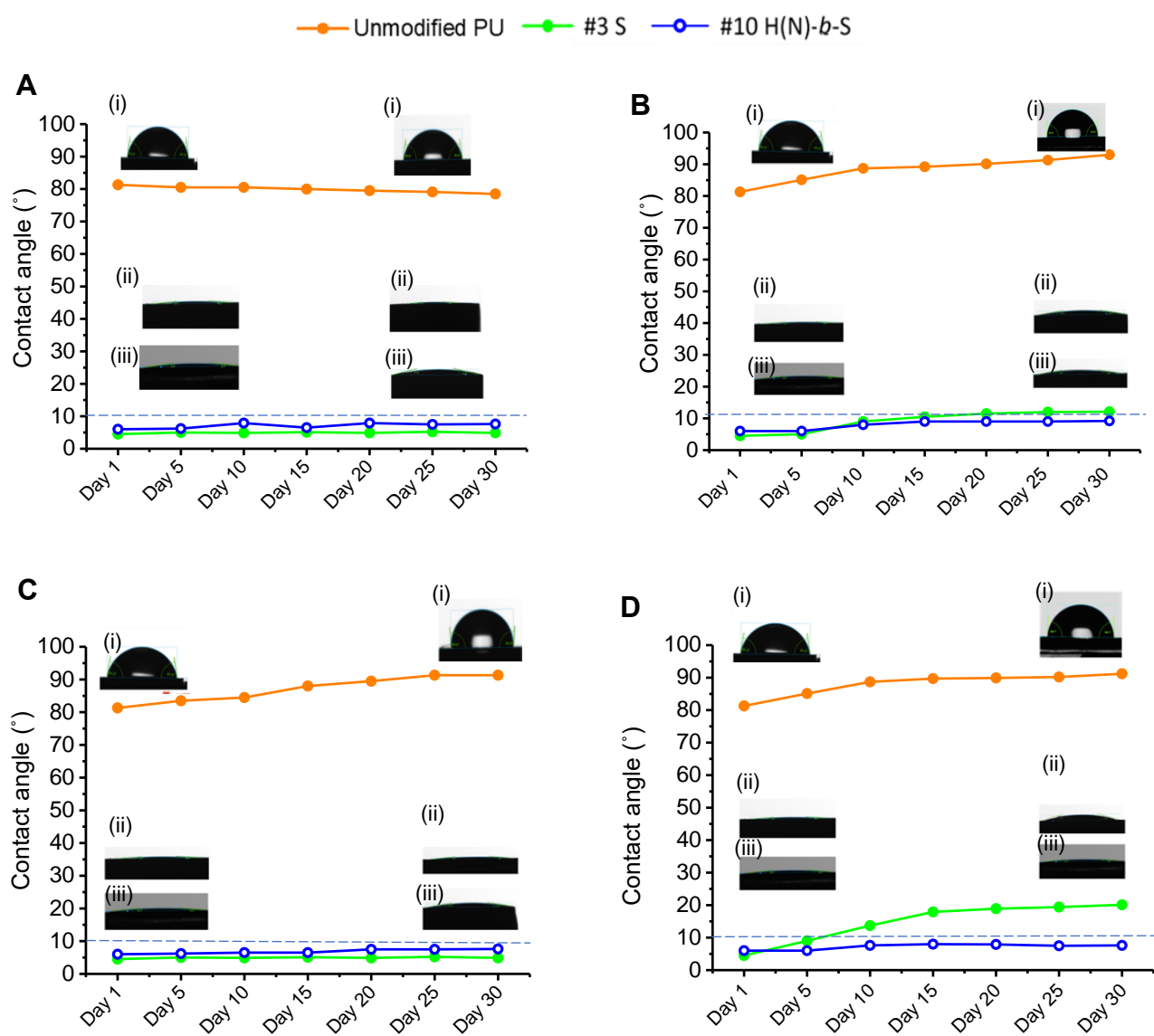




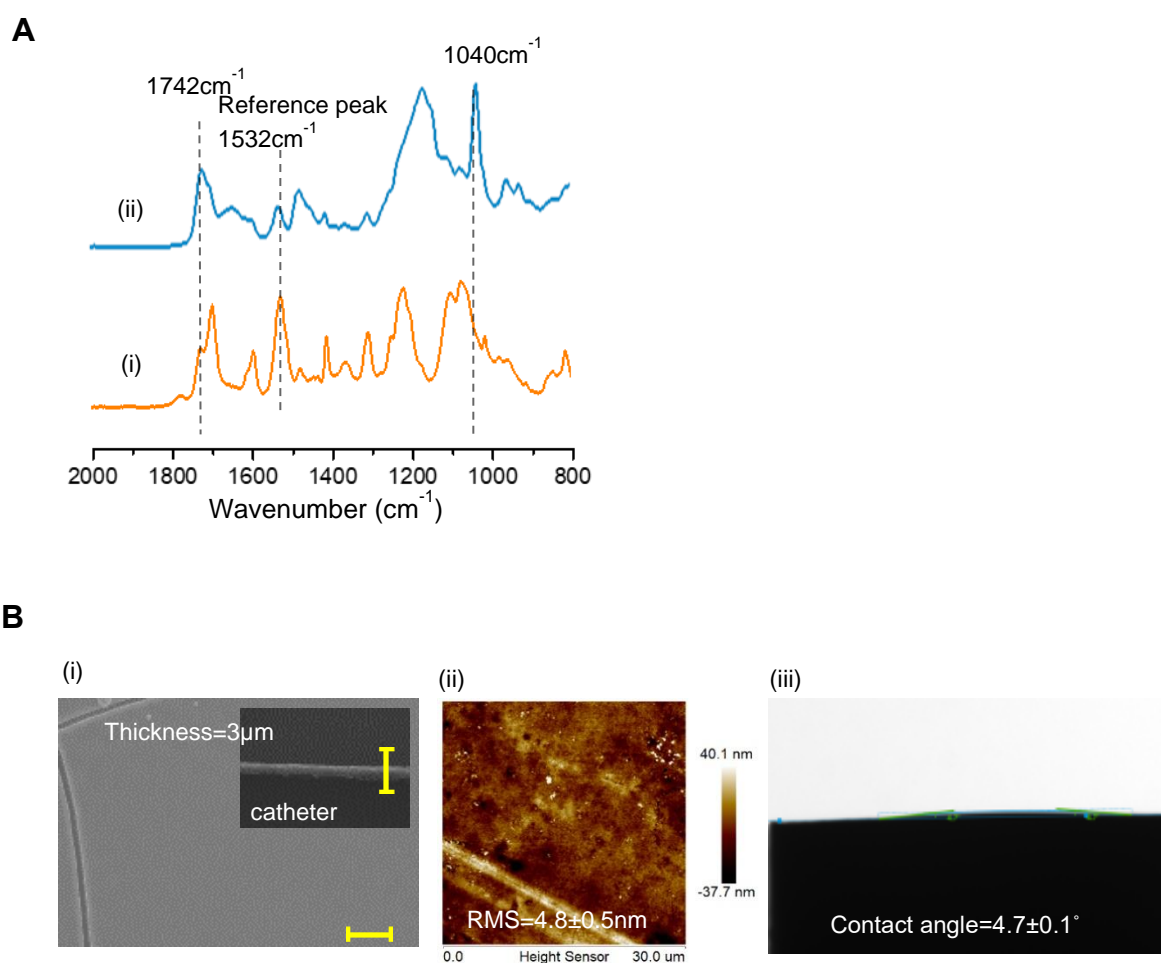
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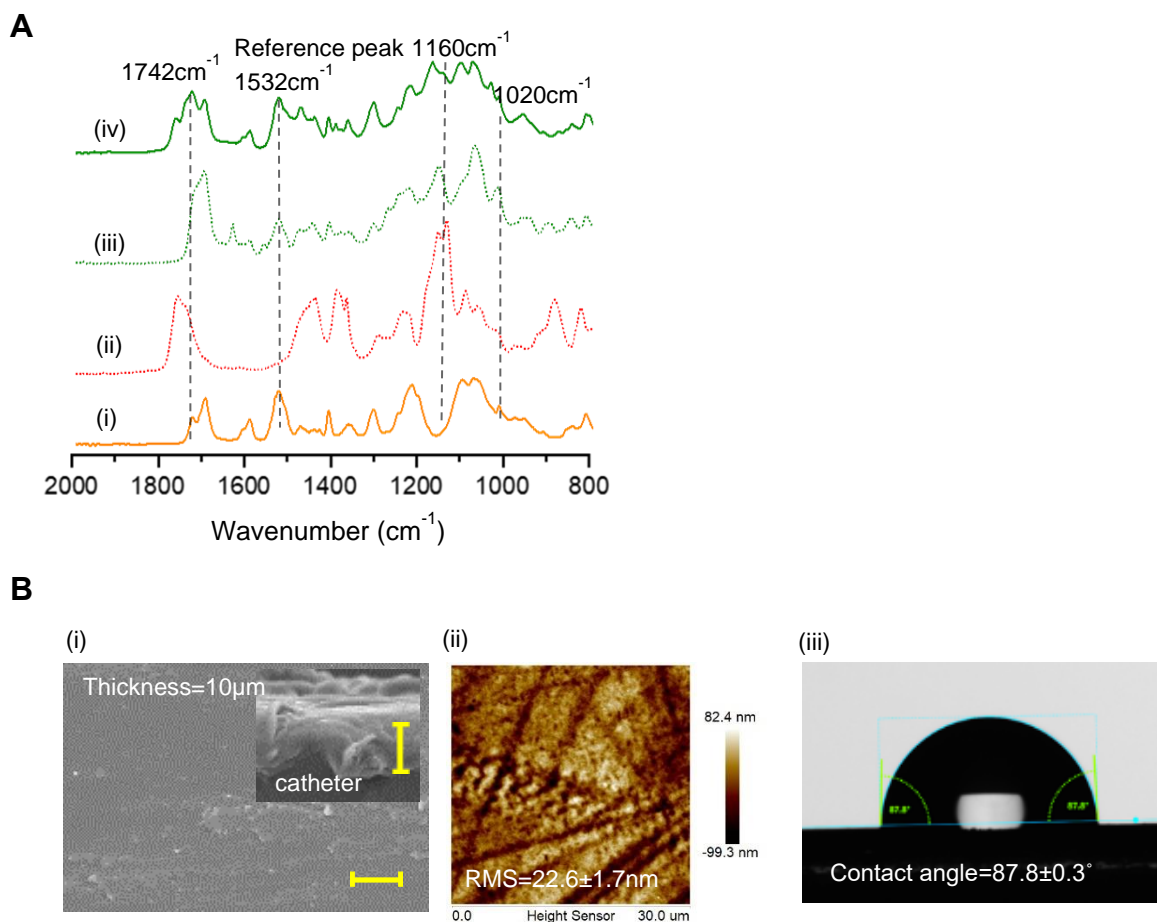
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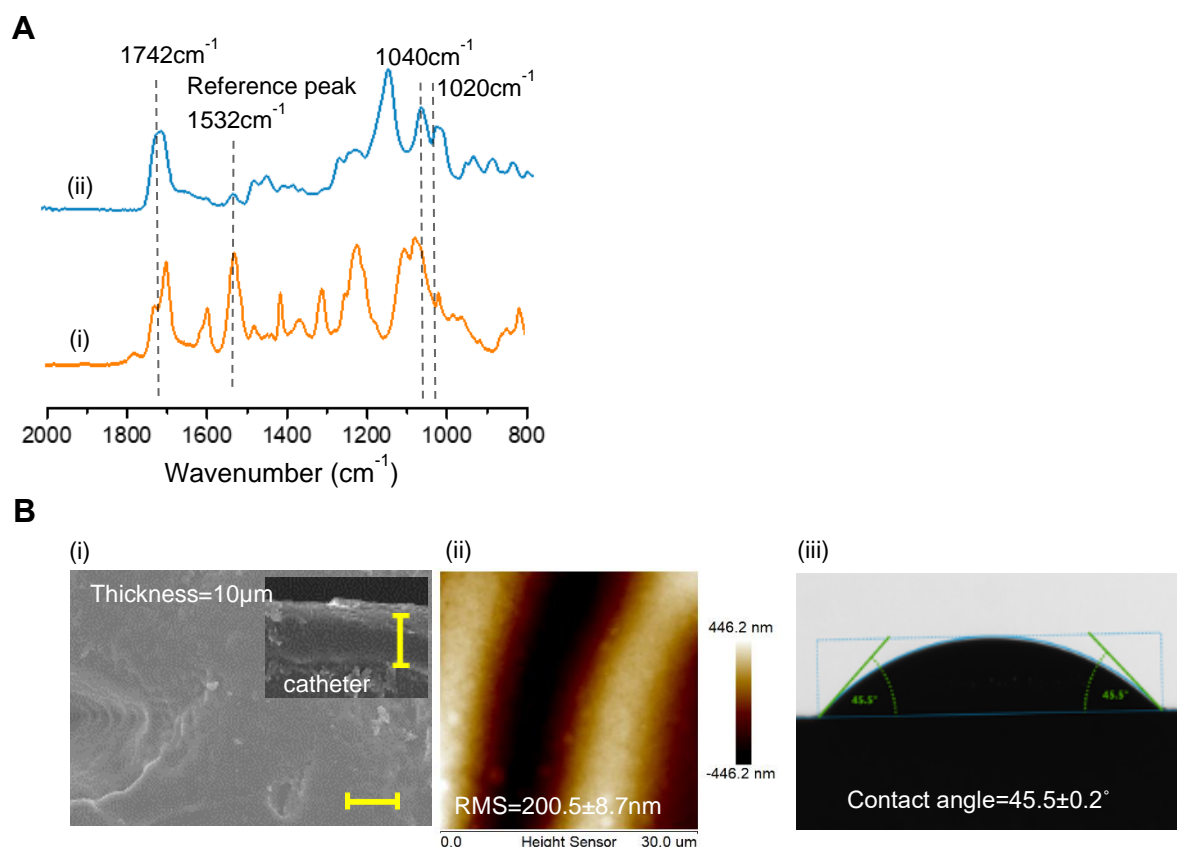
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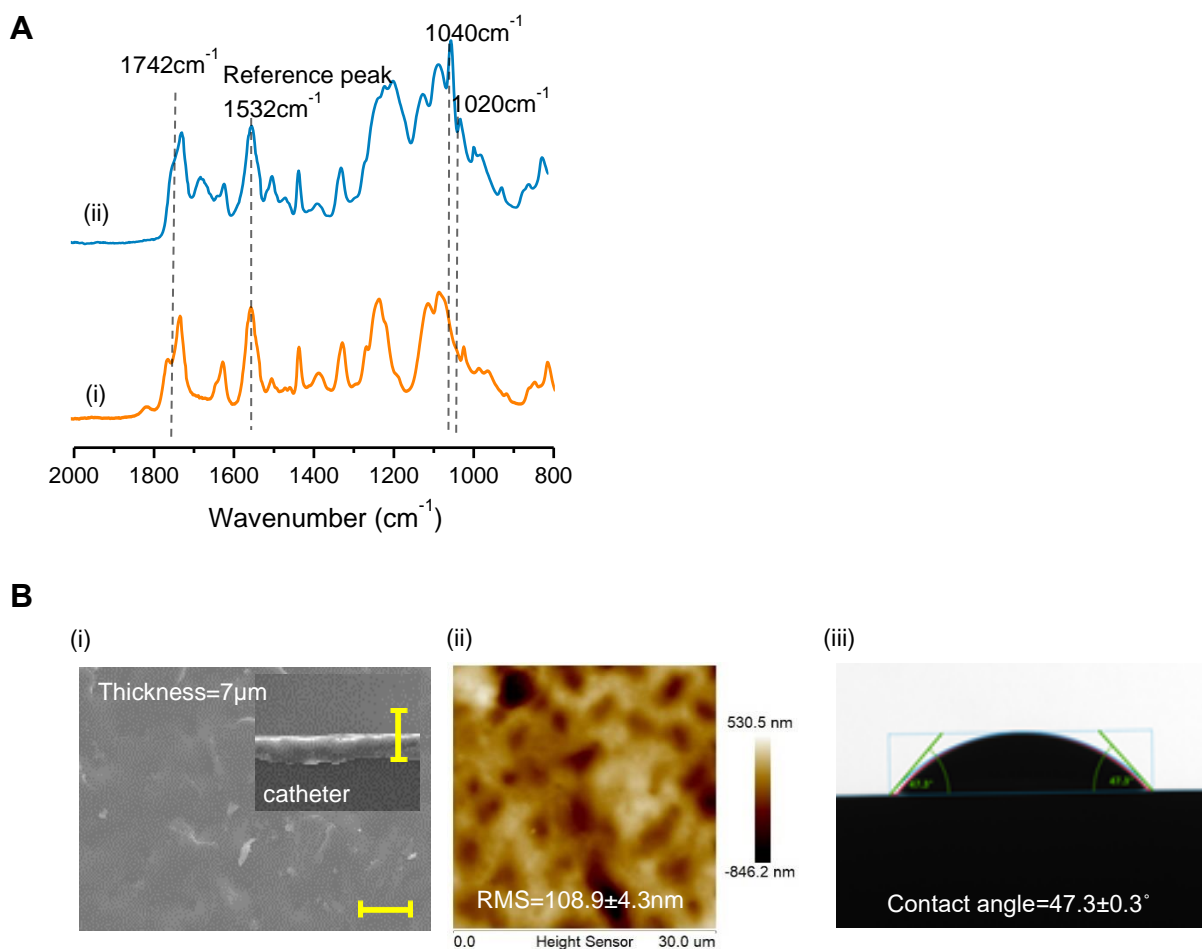
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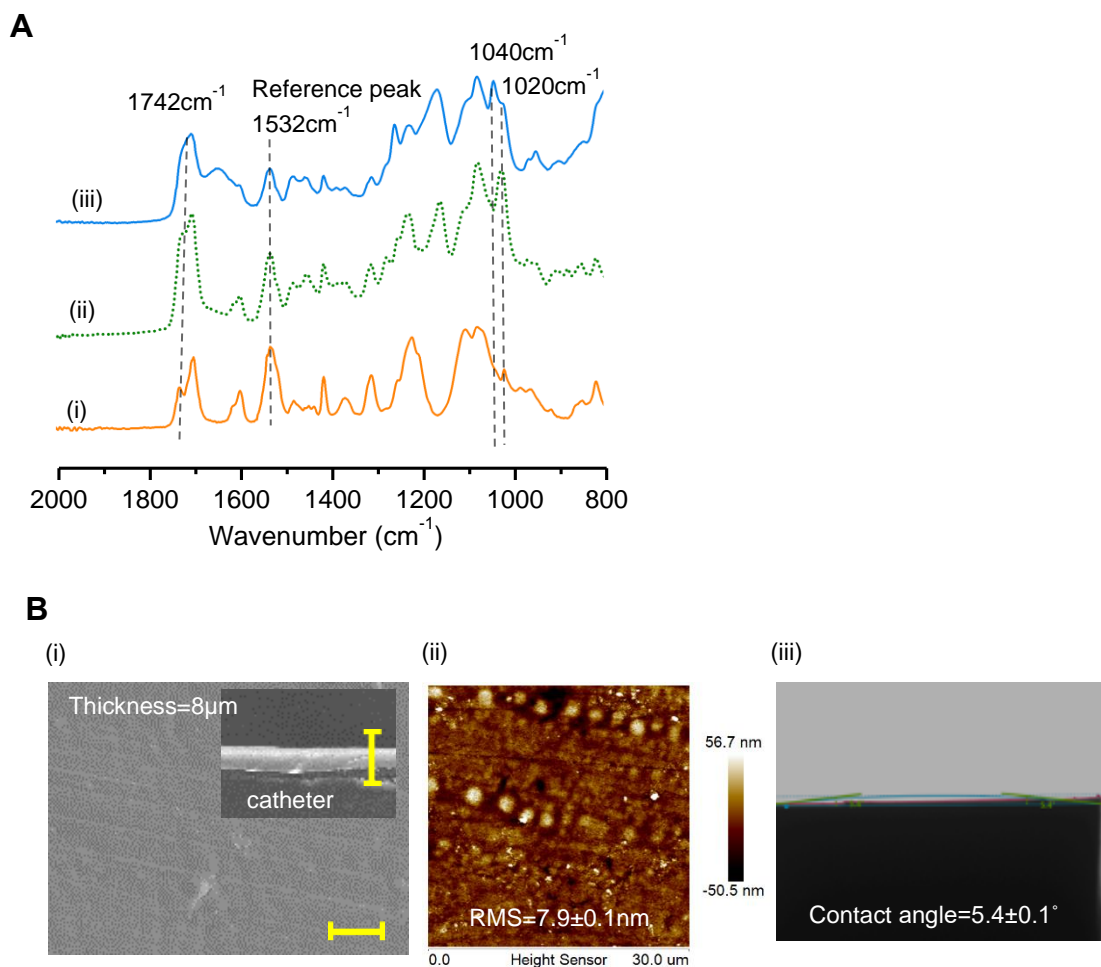
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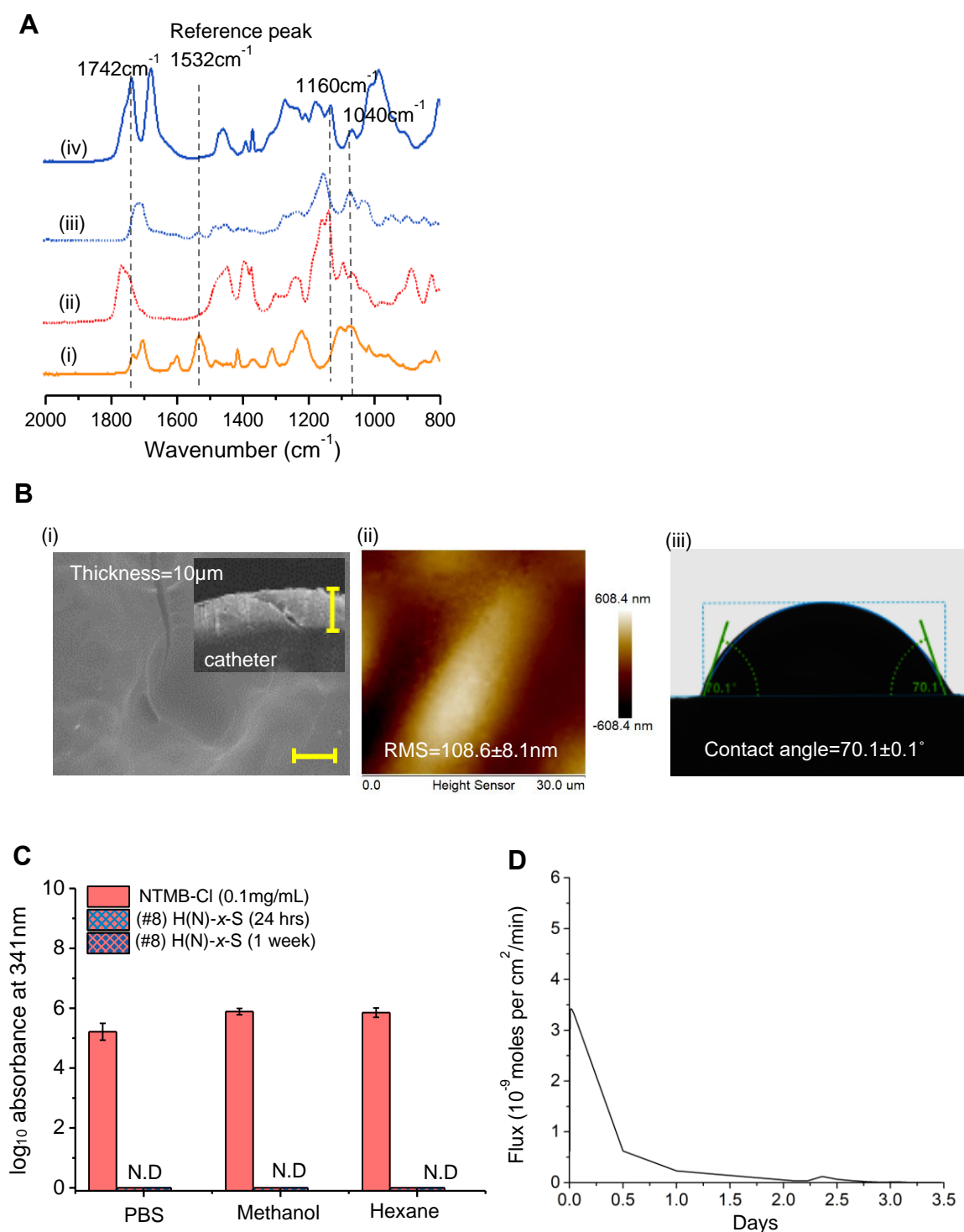


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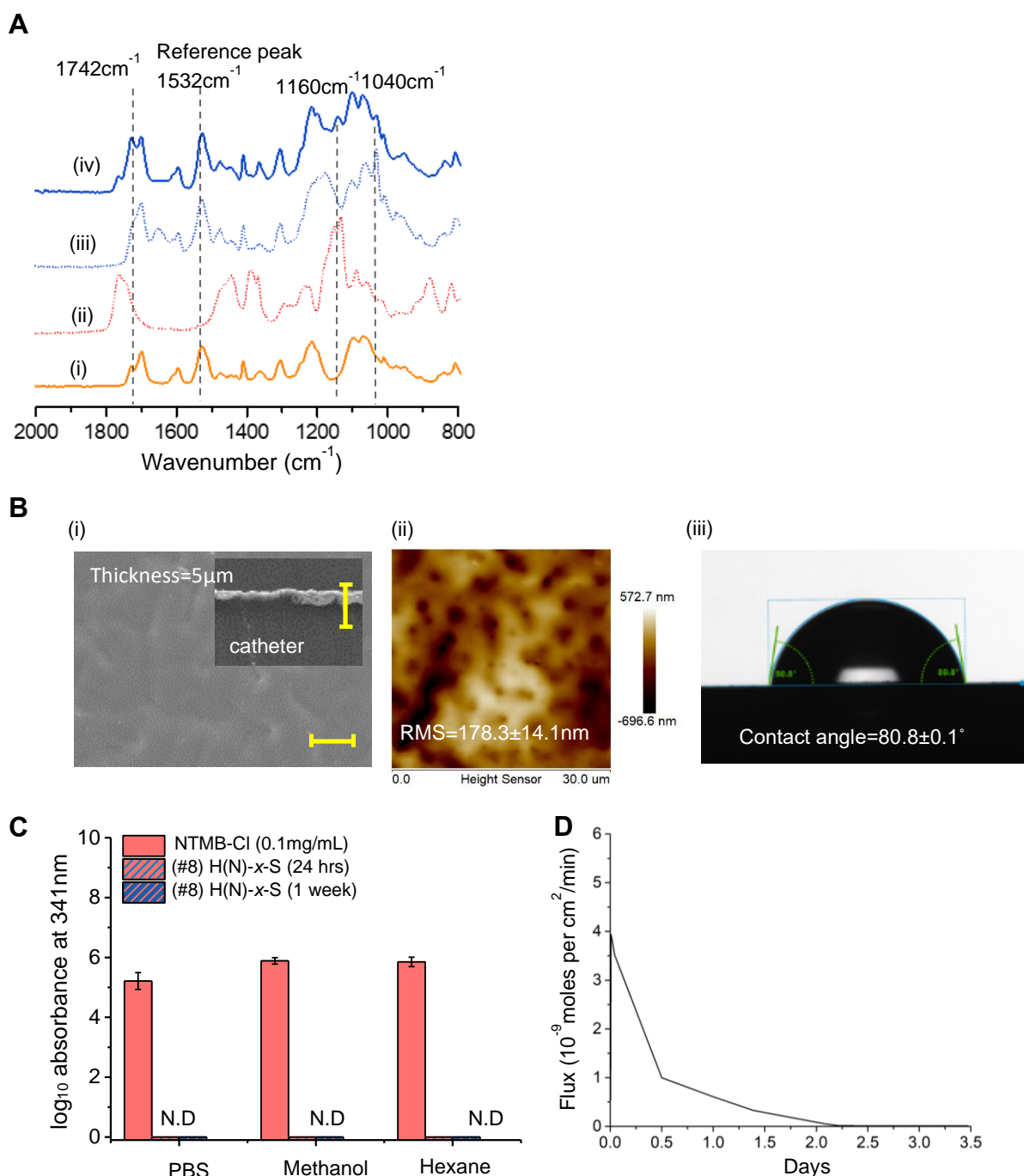


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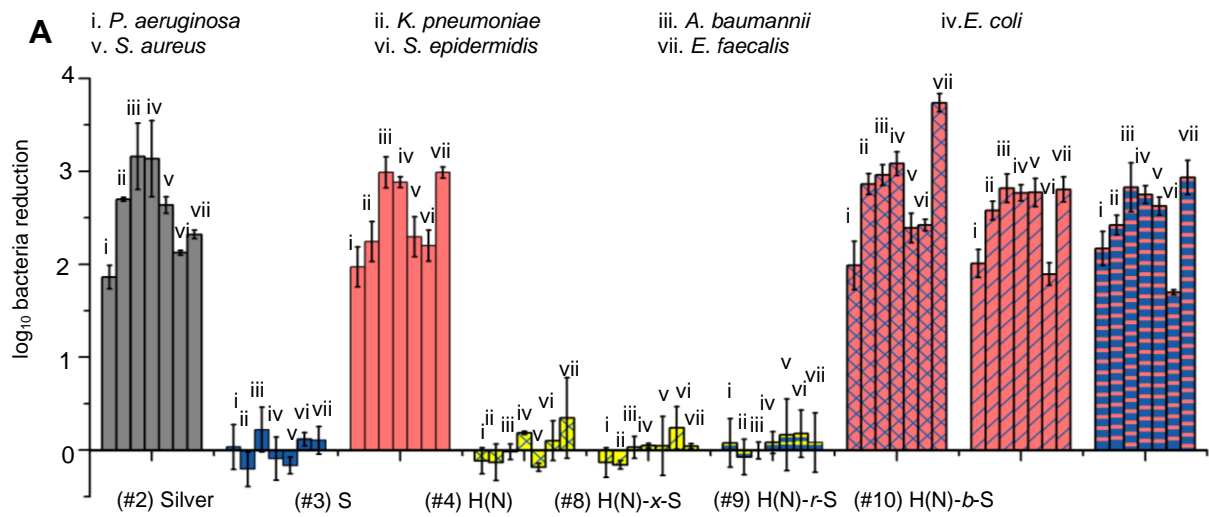




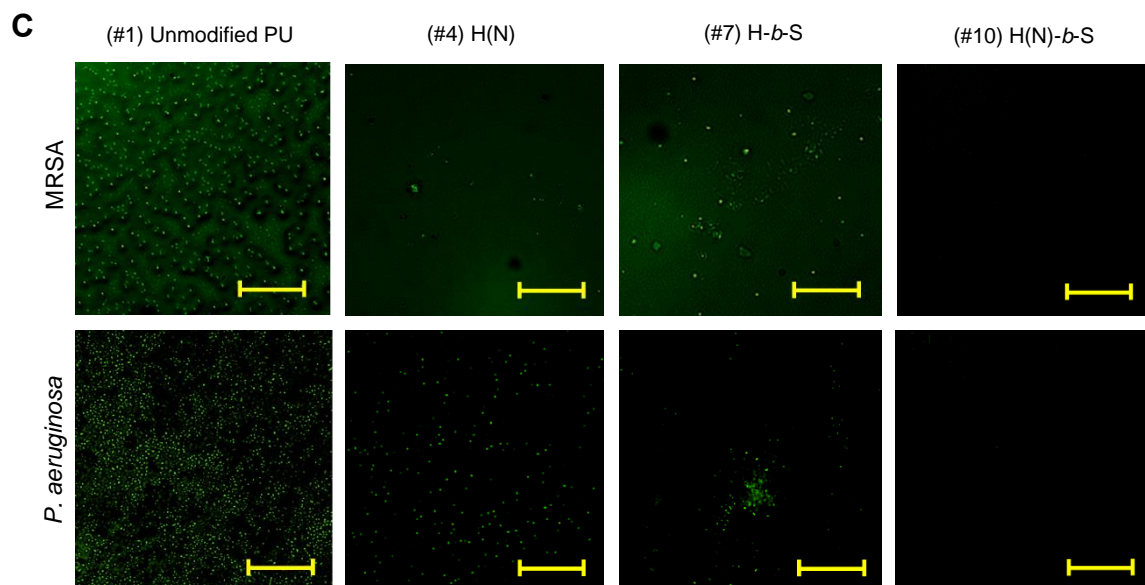
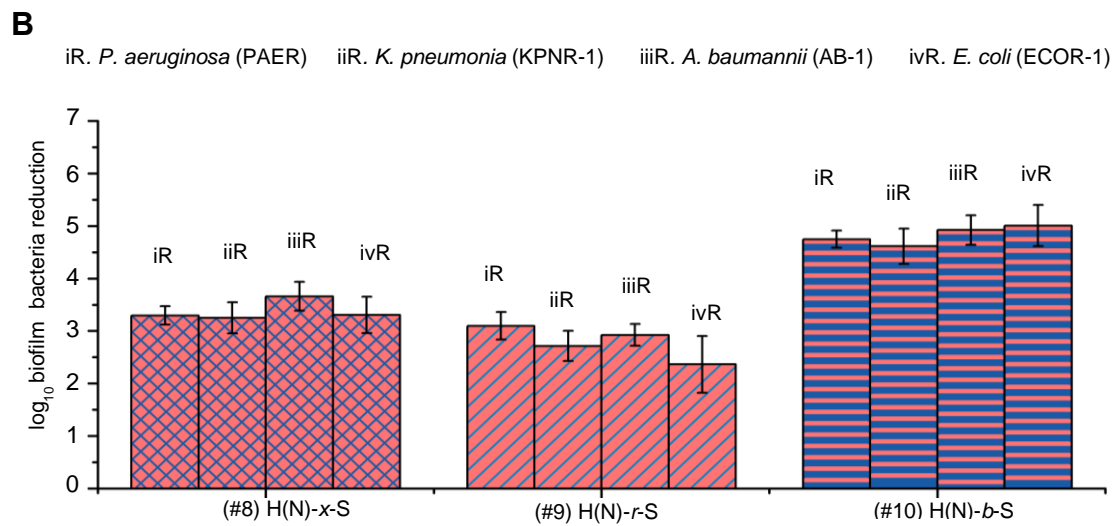
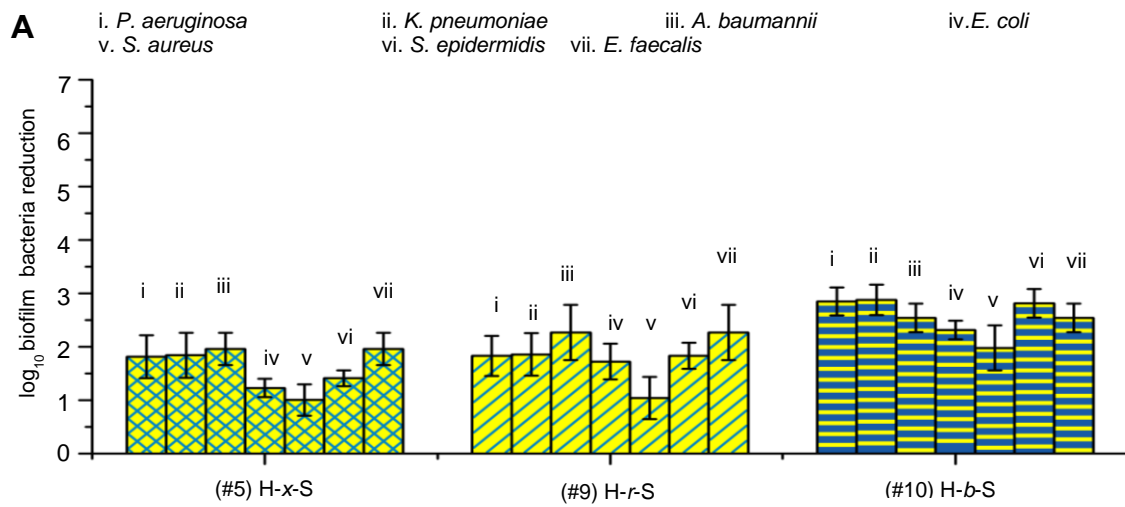
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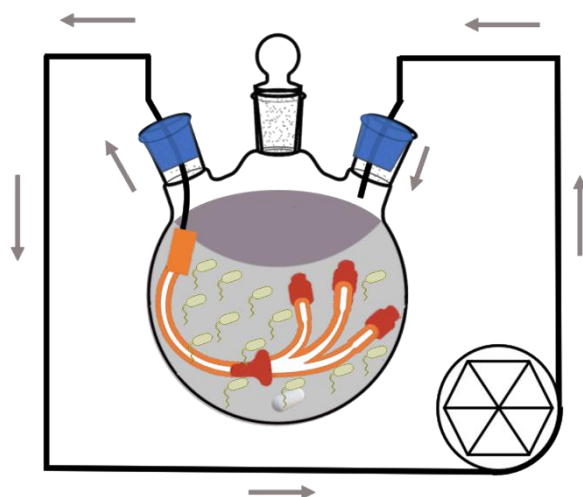
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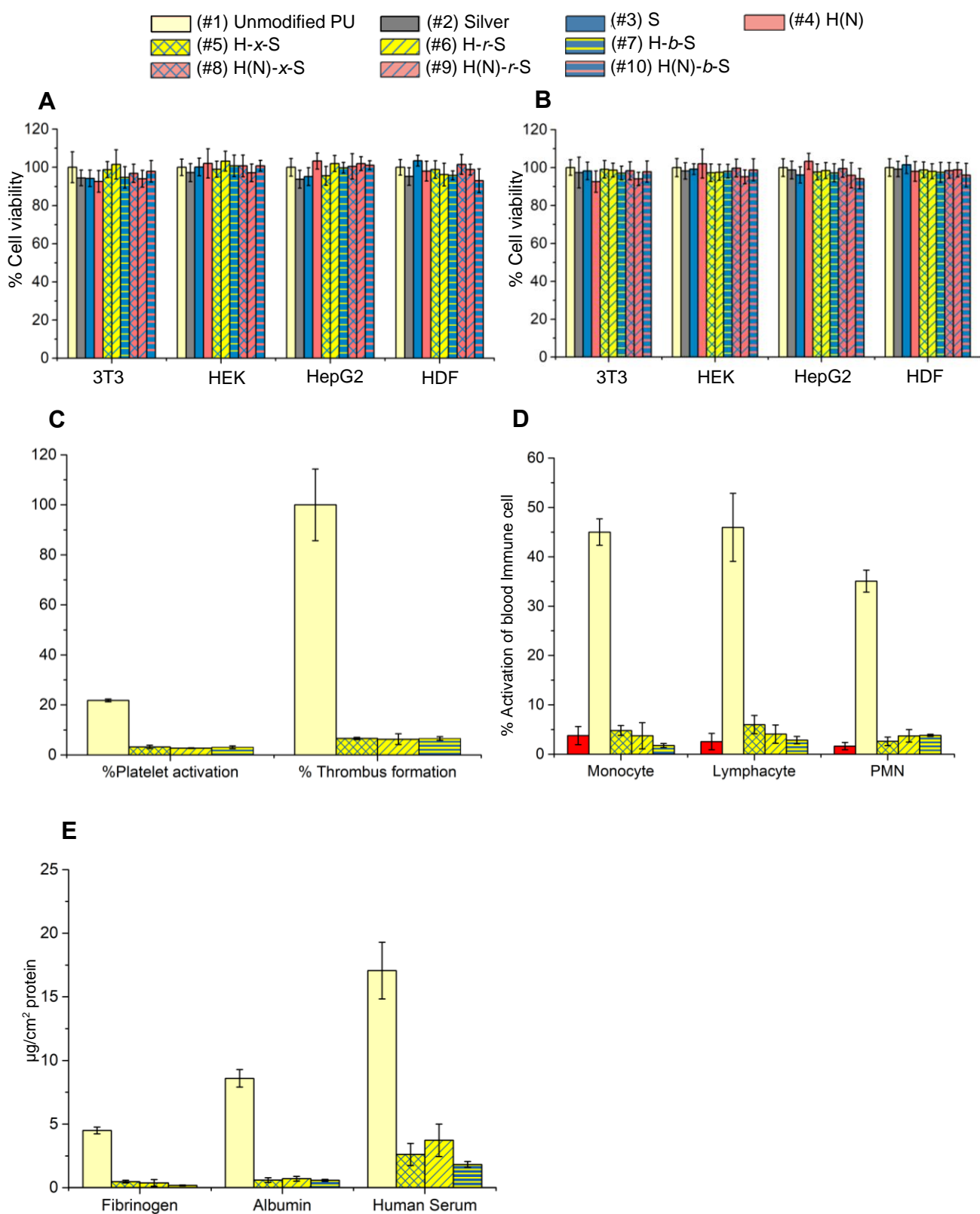
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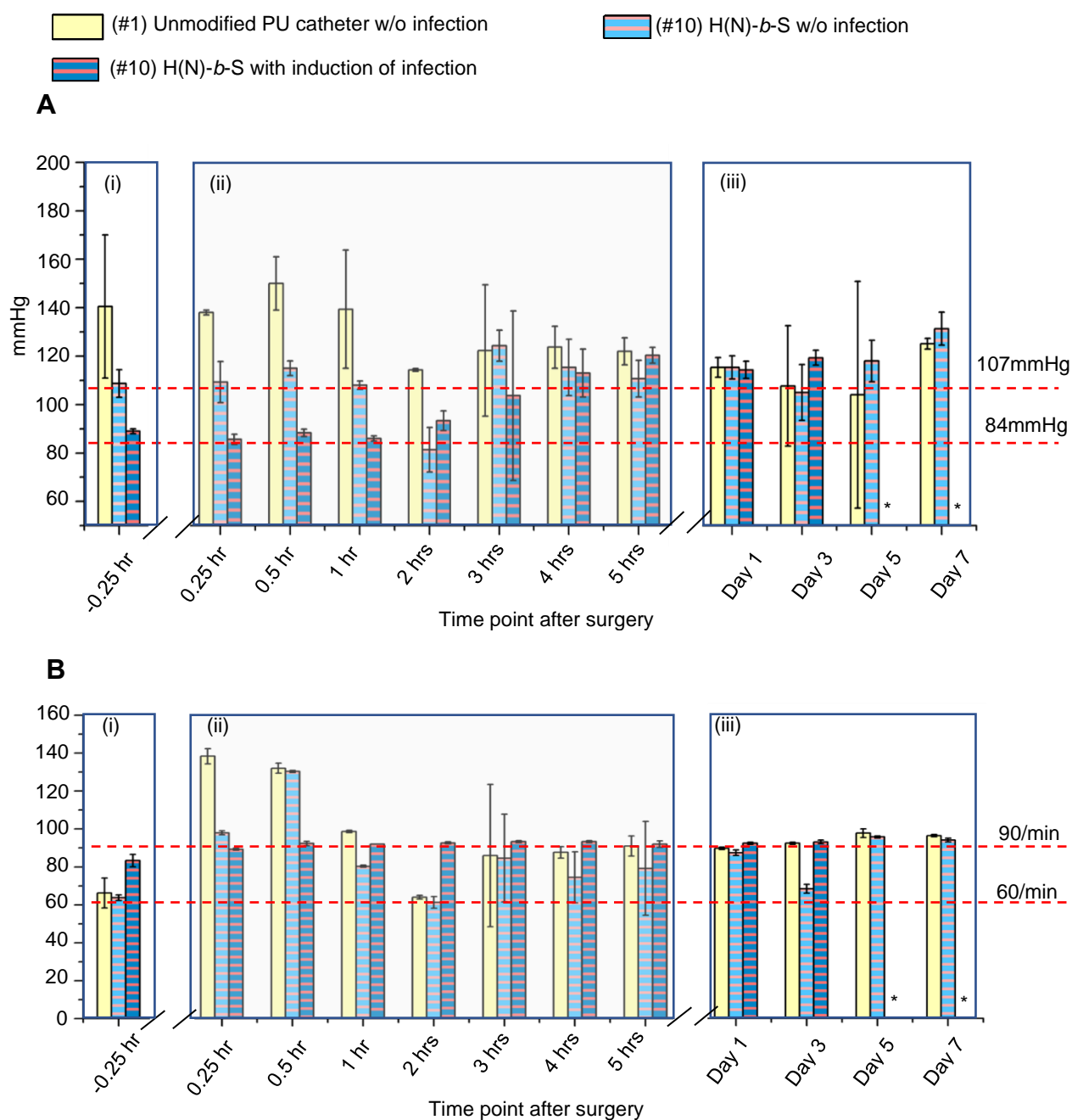
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**Figure S14.** (A) *In vitro* antibiofilm efficacy of intermediate coatings (#5, #6 and #7) against some Gram-positive and Gram-negative bacteria. (B) *In vitro* antibiofilm efficacy of NO-release coatings against multi-drug resistance (MDR) Gram-negative bacteria. (C) Fluorescence Microscopy of catheters incubated with MRSA and *P. aeruginosa* (scale bar=20 $\mu$ m). (D) Illustration of intraluminal circulation setup for antibiofilm test.



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**Equation S1** Surface peroxide group density

Volume of Sodium thiosulfate solution (0.01mM) used: 3.30mL

Moles of peroxide equals moles of thiosulfate titrated, calculated as below:

$$0.01 \times 10^{-3} \times 3.30 \times 10^{-3} = 3.3 \times 10^{-8} \text{ mole of peroxide per 5mm of catheter}$$

Calculation of peroxide group density ( $\sigma$ ):

$$\sigma = \frac{\text{No. of peroxide group on 5mm of catheter}}{\text{Surface area of 5mm catheter}}$$

$$\sigma = \frac{3.3 \times 10^{-8} \times 6.023 \times 10^{23}}{0.25 \times 0.5 \times \pi + 0.4 \times 0.5 \times \pi + 2 \times ((0.5 \times 0.4)^2 - (0.5 \times 0.25)^2) \times \pi}$$

$$\sigma = \frac{1.98 \times 10^{16}}{1.17 \text{ cm}^2}$$

$$\sigma = 1.69 \times 10^{16} / \text{cm}^2$$

$$\sigma = 169 / \text{nm}^2$$