Supporting Information

**Nylon-6/Chitosan core/shell antimicrobial nanofibers for the prevention of mesh-associated surgical site infection**

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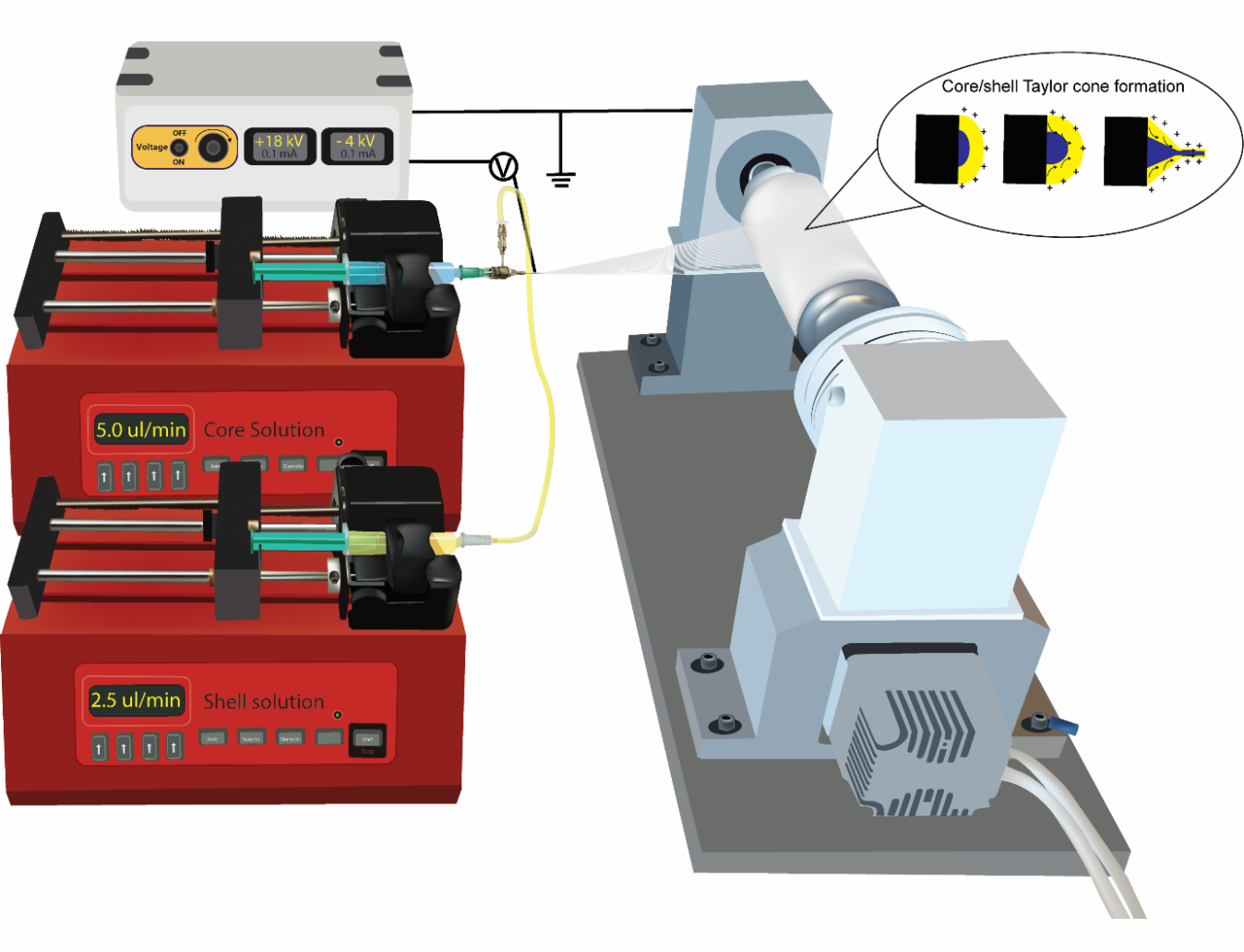
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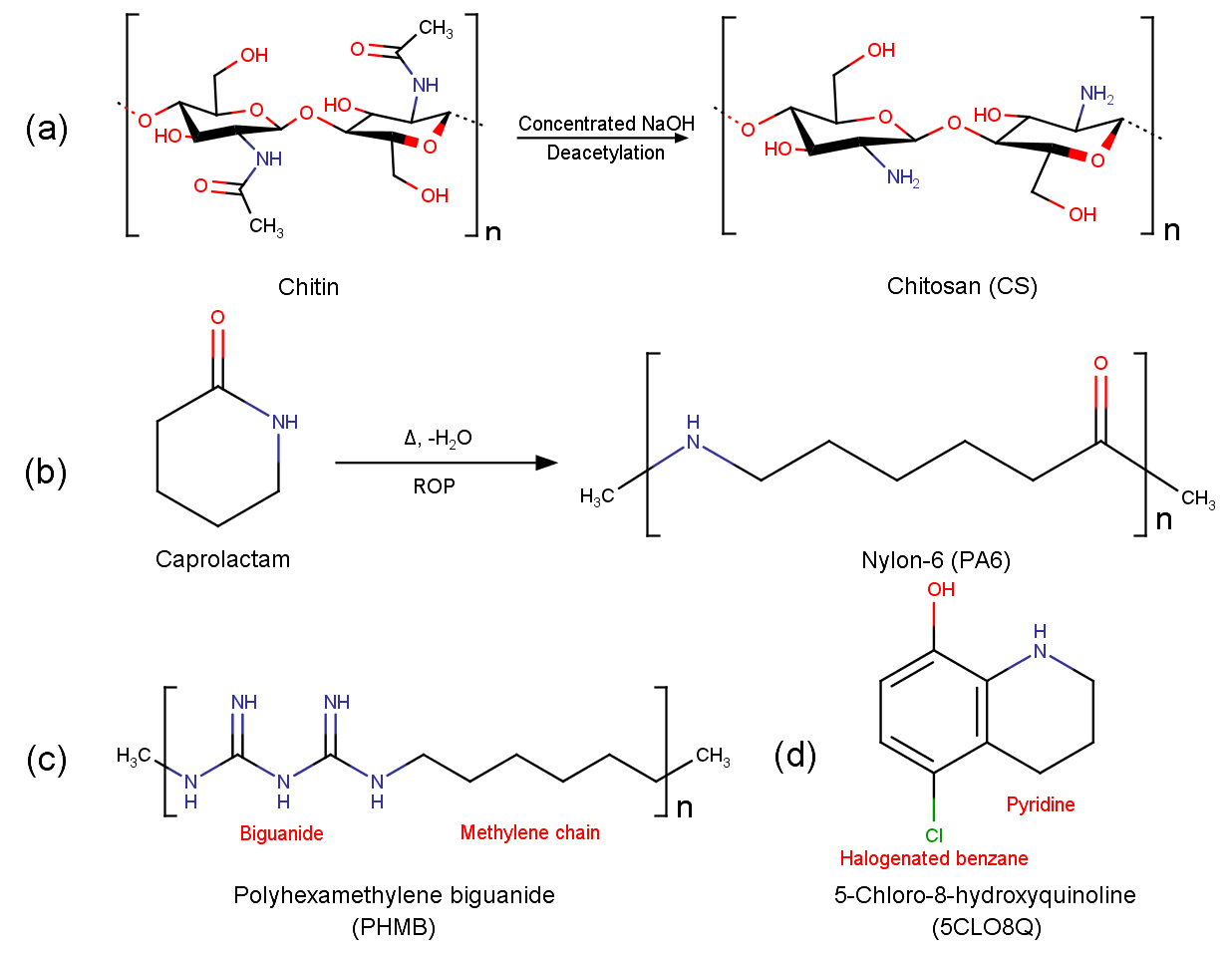
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**Figure S1.** Schematic representation of the co-axial electrospinning setup used for the production of core/shell PA6-PHMB/CS-5CLO8Q nanofibrous membranes.

**** Figure S2.Chemical structures of the proposed polymers and antimicrobial system. (a) Deacetylation of chitin to yield CS, (b) Ring opening polymerization of ϵ-caprolactam to form PA6, (c) PHMB and (d) 5CLO8Q.

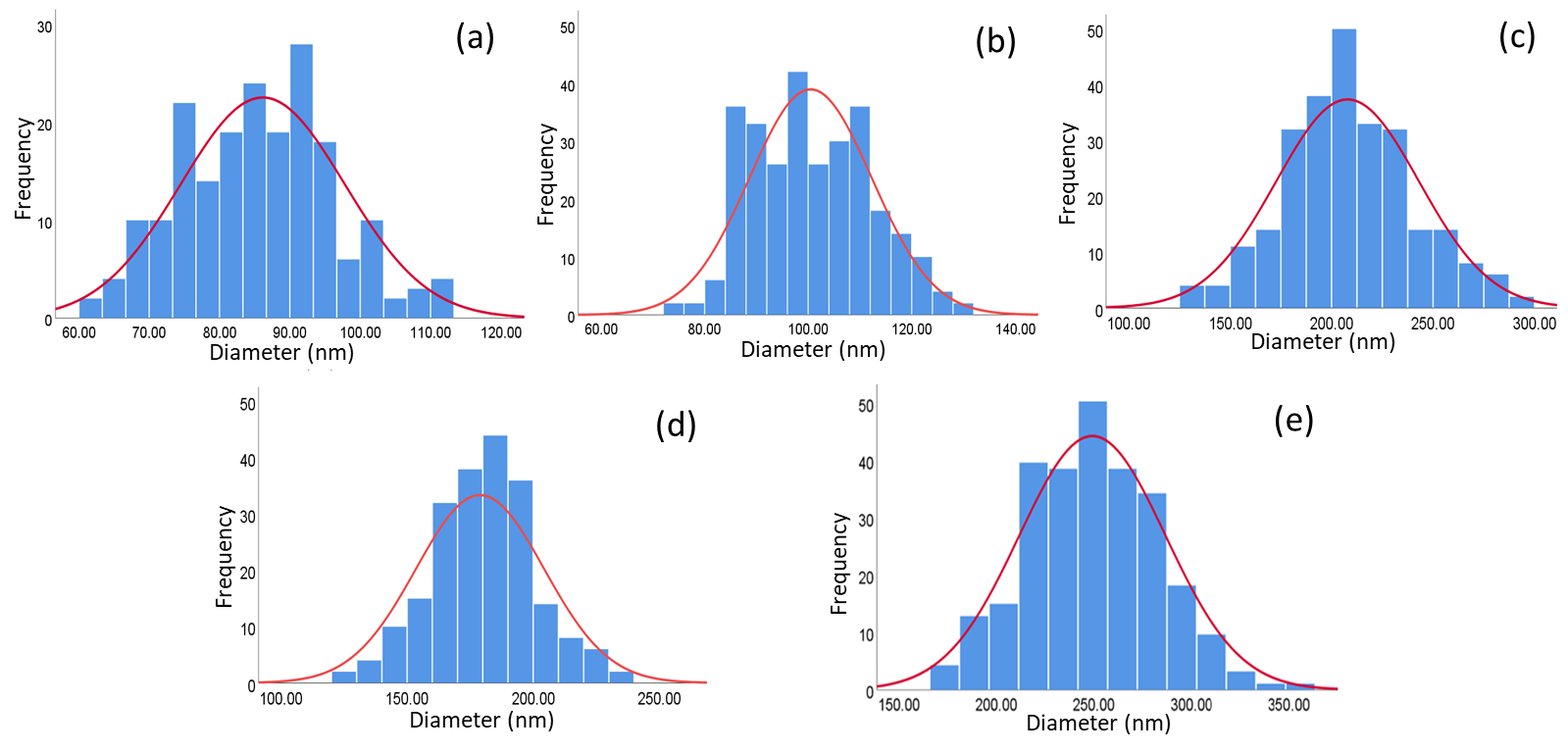
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Figure S3. Fiber diameter distributions of the electrospun (a) CS, (b) PA6, (c) CS-5CLO8Q, (d) PA6-PHMB and (e) core/shell PA6-PHMB/CS-5CLO8Q nanofibrous mats.

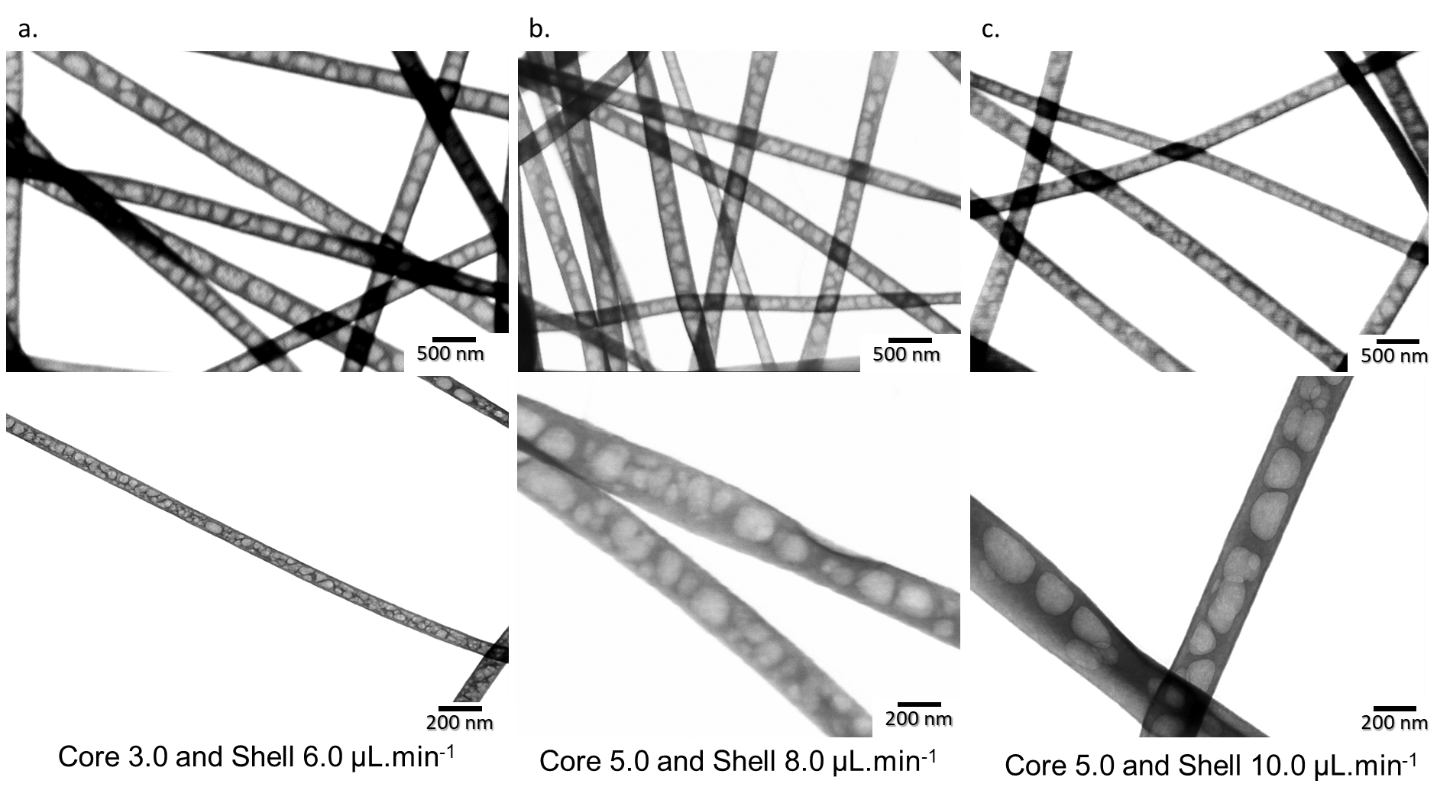
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Figure S4.STEM micrographs of the PA6-PHMB/CS-5CLO8Q core/shell NFs in different flow rates, under the same electrospinning and solution parameters. (a.) Core to shell feed rate 3.0 and 6.0 , (b.) 5.0 and 8.0 and (c.) 5.0 and 10.0 μL.min-1).

**(a)**

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****Figure S5.FTIR-ATR spectra of the produced (a) drug-free 3% w/v CS (CS:PEO 80:20 w/w) (CS) and 21% w/v PA6 NFs, and pristine CS and PEO powders. (b) Pristine antimicrobial substances 5CLO8Q powder and PHMB powder.

**(b)**

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Figure S6.FTIR-ATR region specific spectra (1200-2000 cm-1) of the drug-containing CS-5CLO8Q, PA6-PHMB, and core/shell NFs.

**Table S1.** XPS analysis of the carbon C1s binding energies.

|  |  |  |
| --- | --- | --- |
| **Bending Energy (eV)** | **Group Peaks** | **Chitosan-5CLO8Q** |
|  | | **At. Conc. (%)** |
| 284.5 | C-C, C-H | 23.1 |
| 285.5 | C=O | 22.3 |
| 286.5 | C-N, C-O | 54.6 |
| **eV** | **Group** | **Nylon-6-PHMB** |
|  | | **At. Conc. (%)** |
| 284.4 | C-C, C-H | 68.5 |
| 287.3 | C=O | 16.4 |
| 285.4 | C-N | 15.1 |
| **eV** | **Group** | **Core/Shell\*** |
|  | | **At. Conc. (%)** |
| 285.7 | C-N, C-O | 47.2 |
| 286.3 | C=O | 25.0 |
| 284.2 | C-C, C-H | 27.8 |

**\***Core/shell is PA6-PHMB/CS-5CLO8Q. At. Conc. (%) = atomic concentration (%).

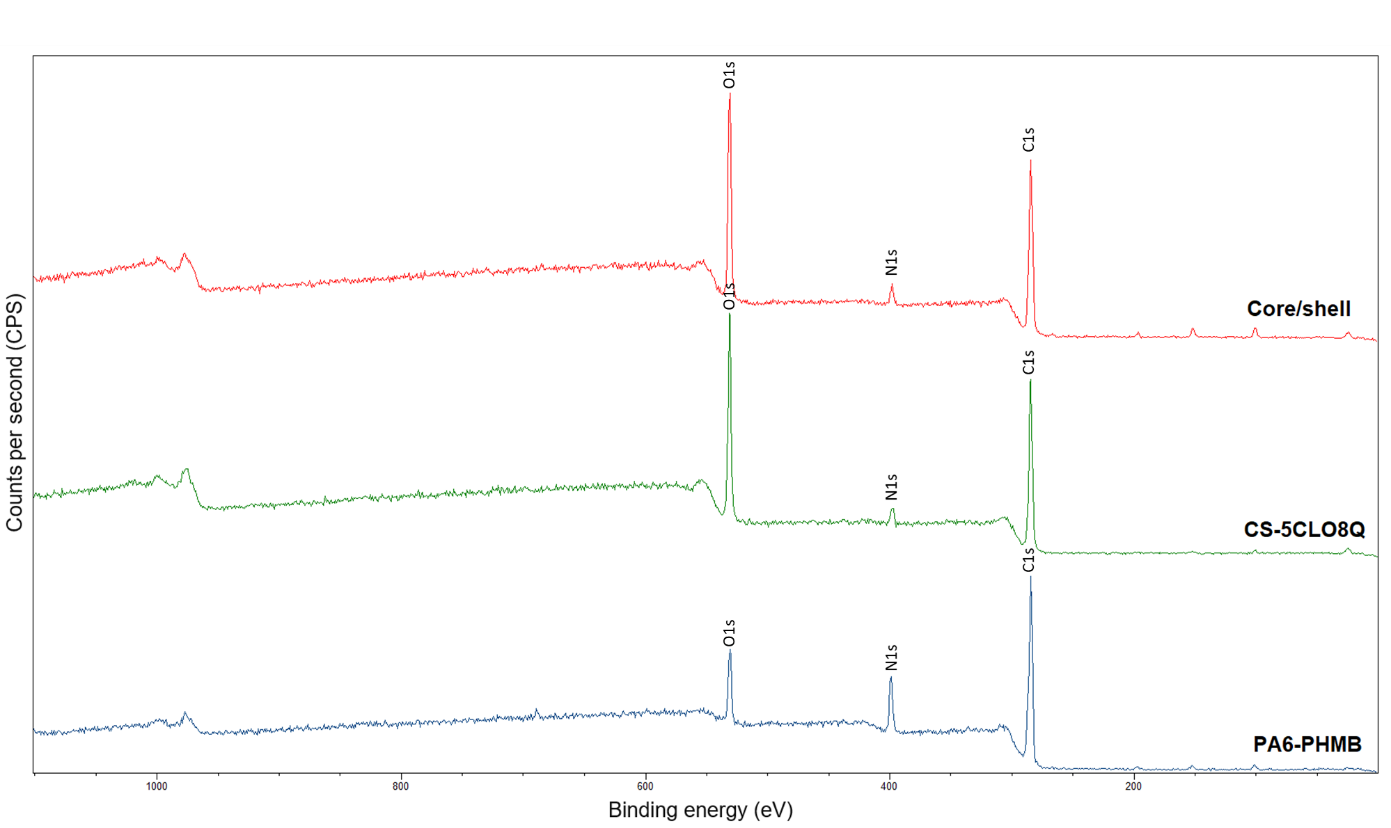
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Figure S7.XPS survey of the PA6-PHMB, CS-5CLO8Q and core/shell PA6-PGMB/CS-5CLO8Q nanofibrous mats.

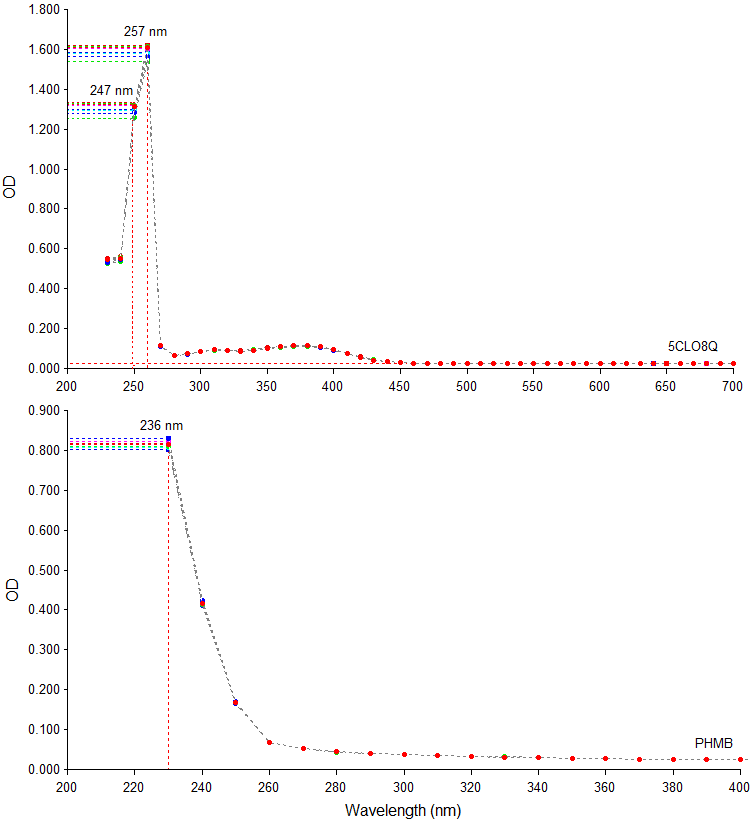
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Figure S8.Absorbance spectra of 5CLO8Q (top) and PHMB (bottom).

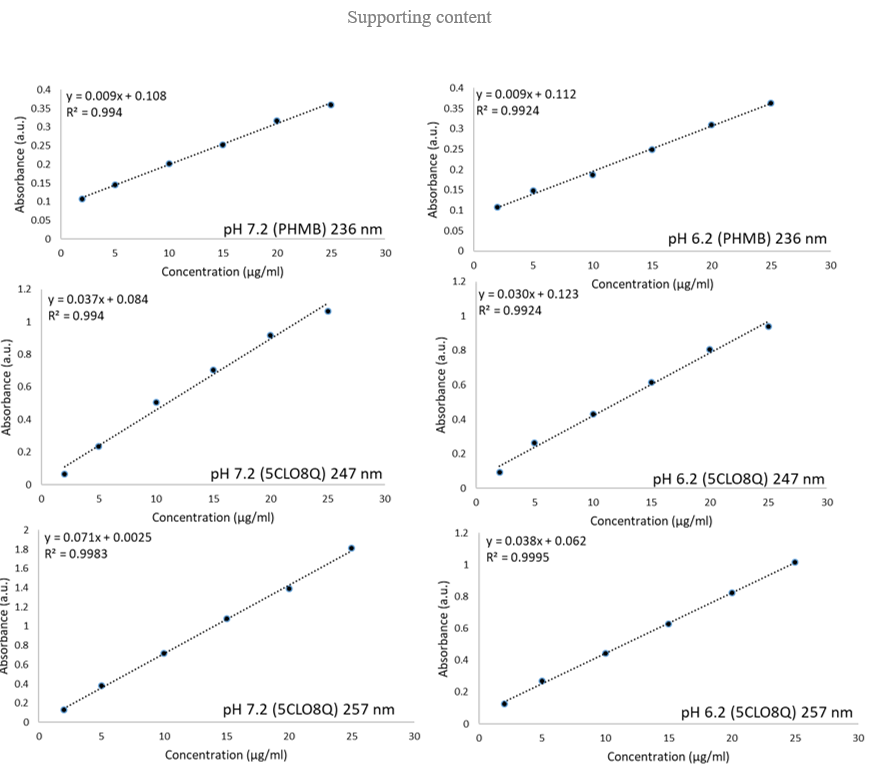
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Figure S9.Standard curves of PHMB (236 nm) and 5CLO8Q (247 and 257 nm) at pH 7.2 and 6.2.