

Hyaluronic acid-Cellulose Composites as Patches for Minimizing Bacterial Infections

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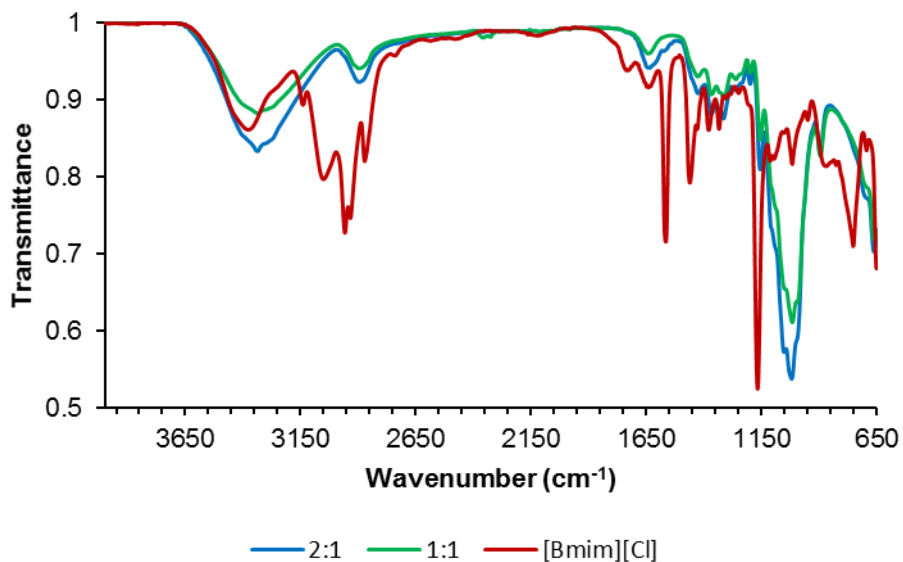
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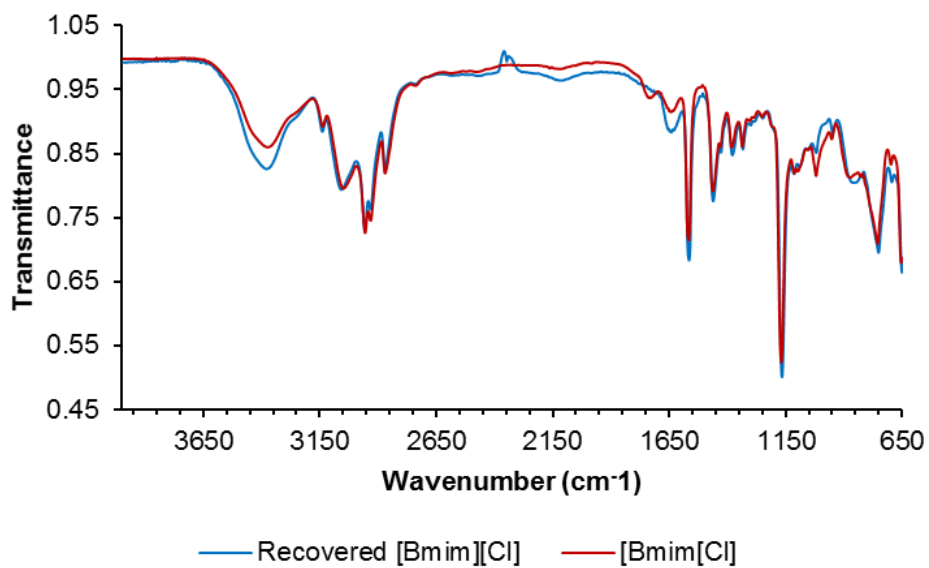
Keywords: Hyaluronic acid; cellulose; GUMBOS; ionic liquids

Supplementary Information

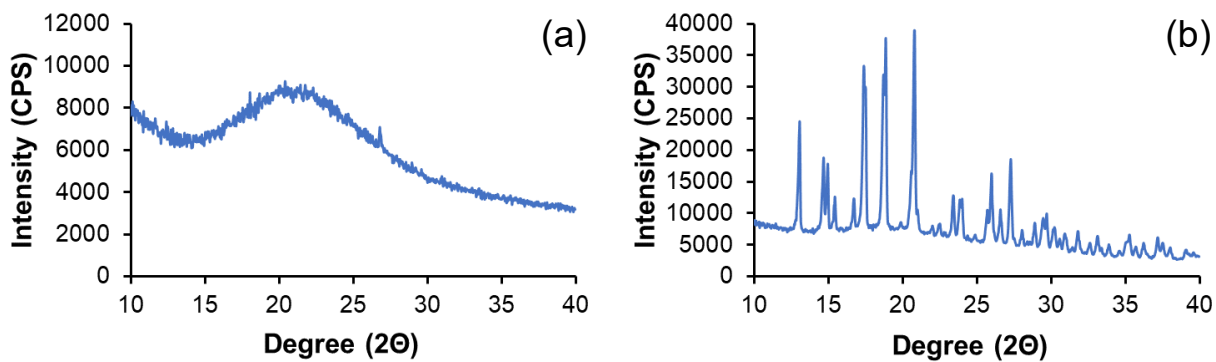
Removal and Recovery of [Bmim][Cl]



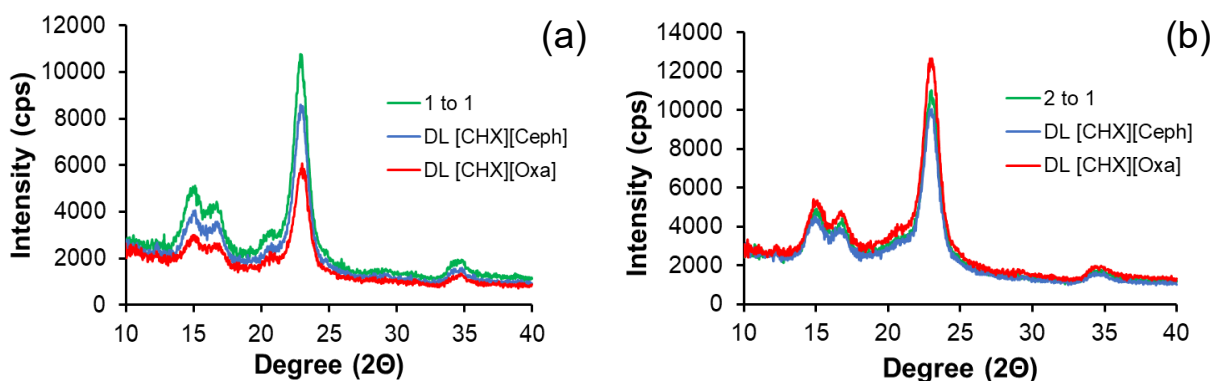
SI Figure 1. FT-IR spectra of 1:1 composite and 2:1 composite to ensure complete removal of [Bmim][Cl].



SI Figure 2. FT-IR spectra of recovered [Bmim][Cl] versus [Bmim][Cl].



SI Figure 3. Powder XRD of [CHX][Ceph] (a), and [CHX][Oxa] (b).

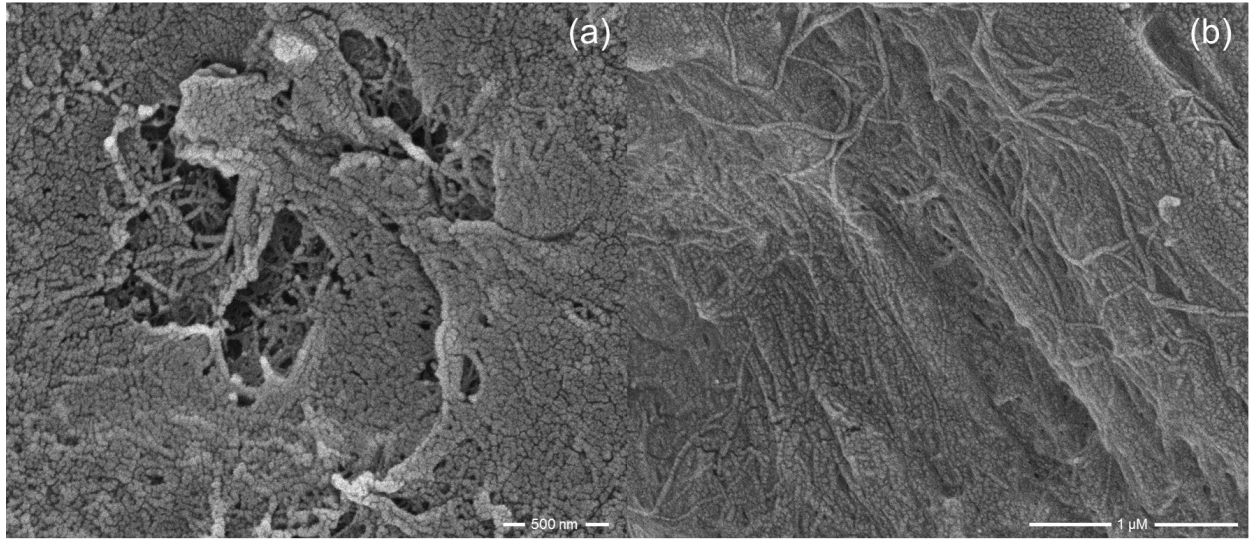


SI Figure 4. XRD of plain composites and drug-loaded (DL) composites; 1:1 composites (a) and 2:1 composites (b). Composites were drug-loaded with 100 μ M.

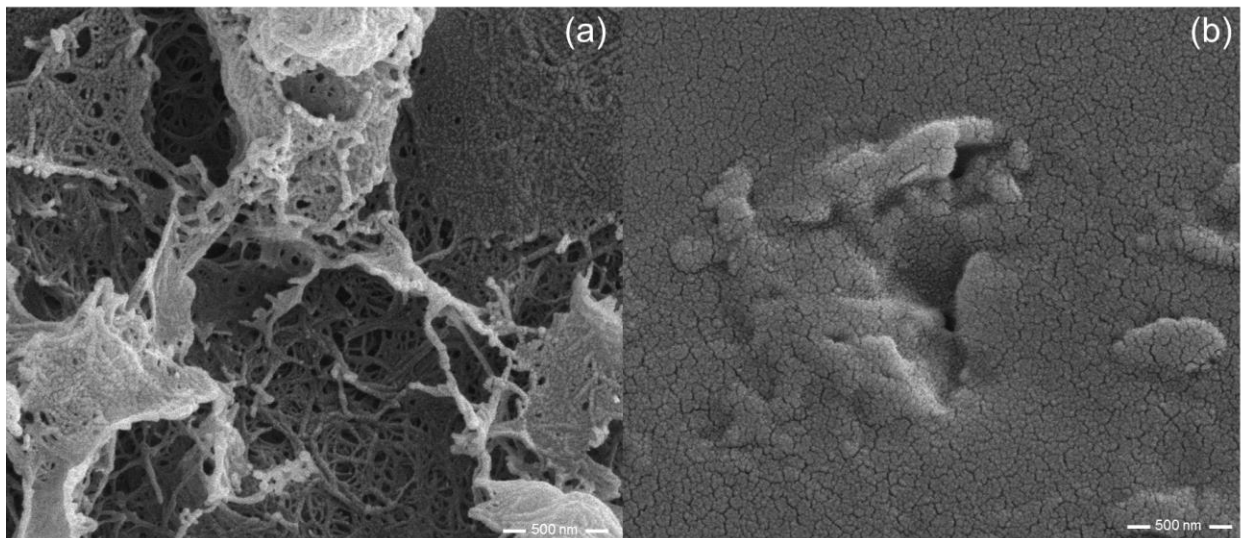
SI Table 1. Crystallinity indices for drug-loaded (DL) 1:1 and 2:1 composites.

Materials	Crystallinity Index (%)
1:1 DL [CHX][Ceph]	78.1
1:1 DL [CHX][Oxa]	75.3
2:1 DL [CHX][Ceph]	75.9
2:1 DL [CHX][Oxa]	77.9

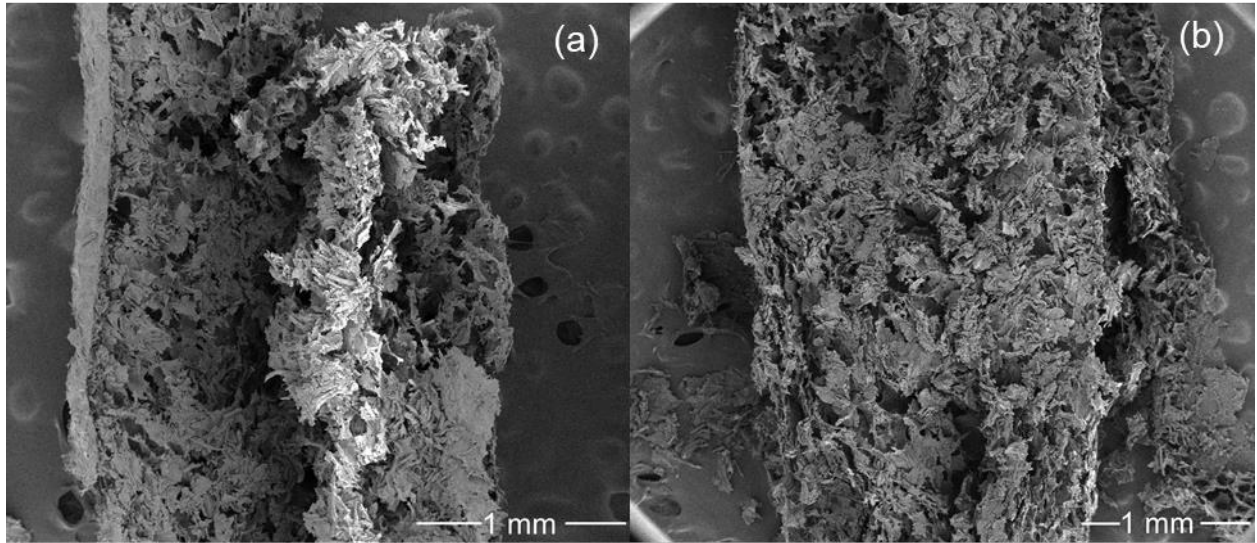
Composites were drug-loaded with 100 μ M.



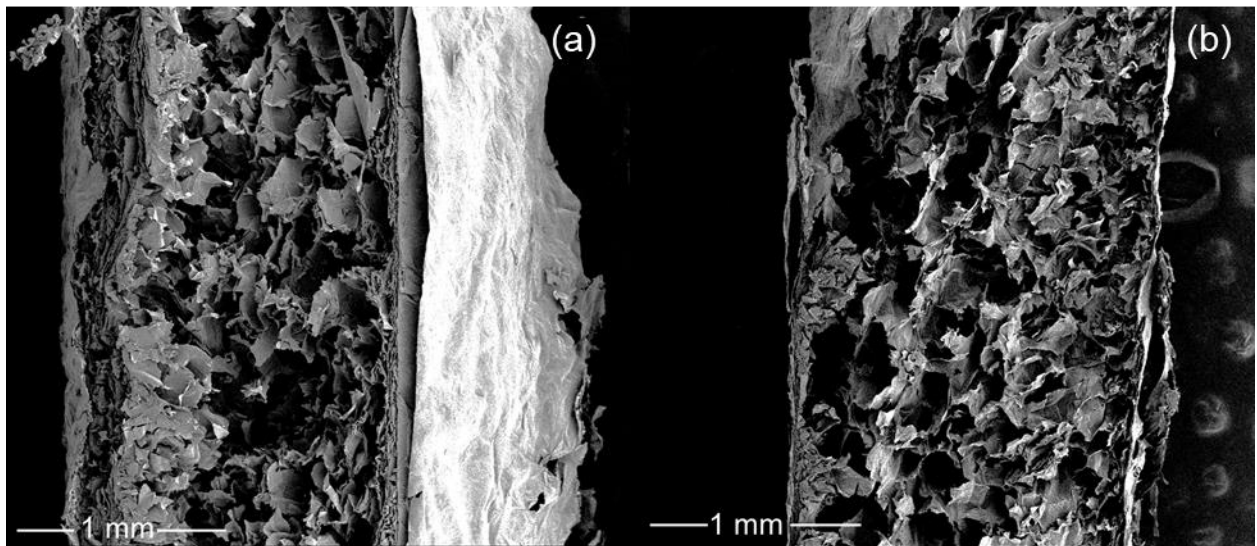
SI Figure 5. 50,000X SEM images of 1:1 composite (a), and [CHX][Ceph] drug loaded 1:1 composite (b).



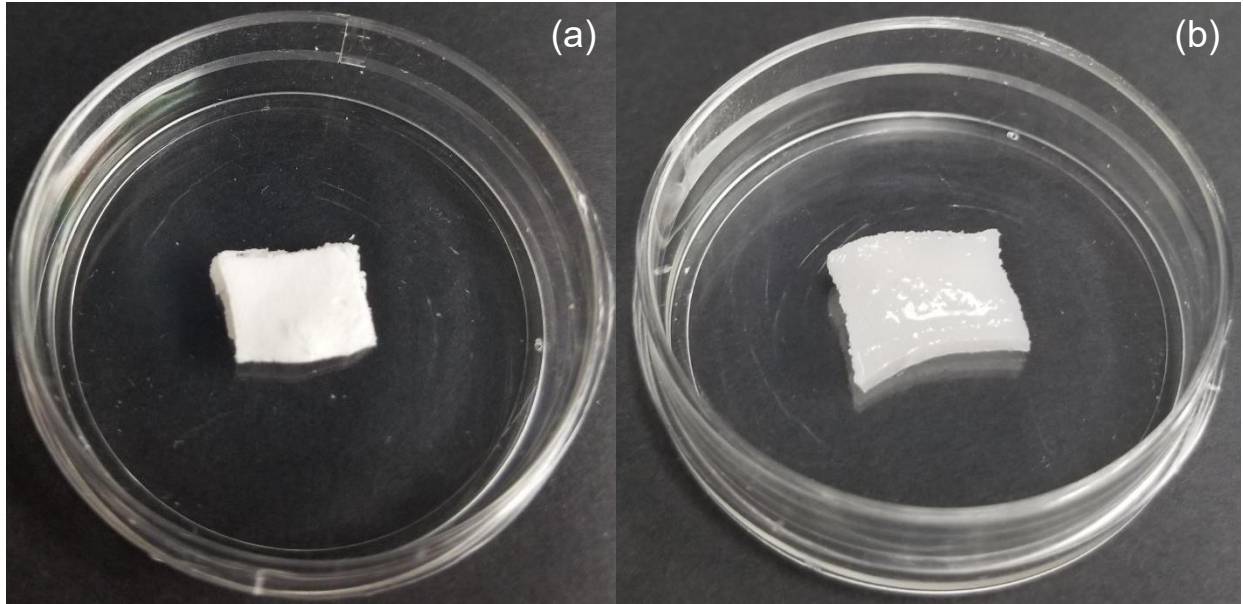
SI Figure 6. 50,000X SEM images of 2:1 composite (a), and [CHX][Ceph] drug loaded 2:1 composite (b).



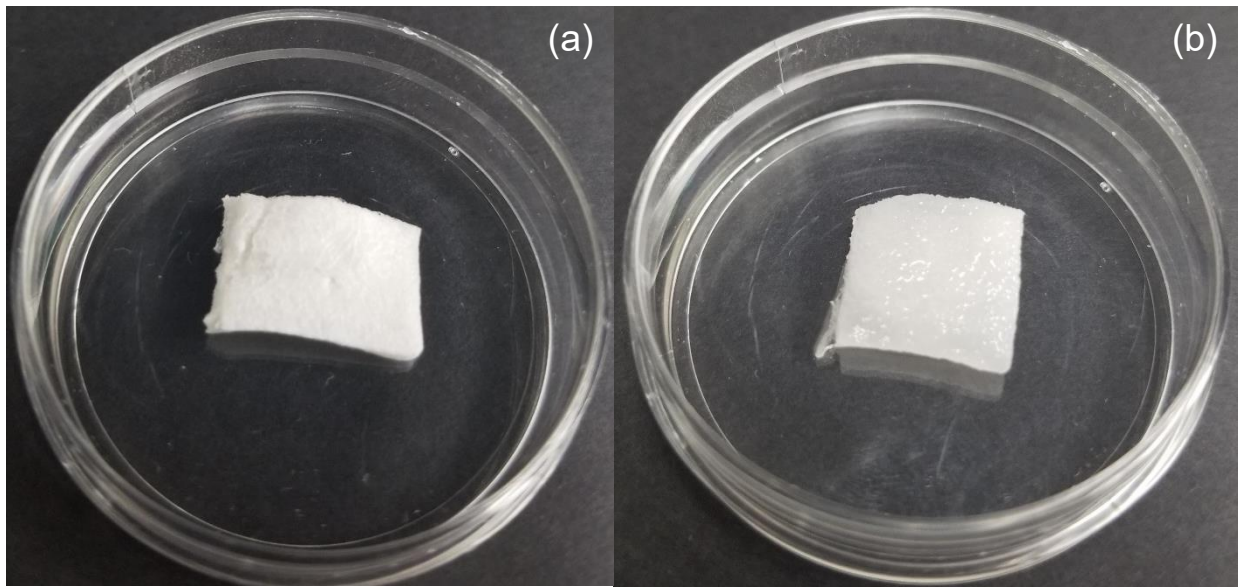
SI Figure 7. Cross-sectional SEM images of 1:1 composite, 50X (a), and [CHX][Ceph] loaded 1:1 composite, 40X (b).



SI Figure 8. 50X Cross-sectional SEM images of 2:1 composite (a), and [CHX][Ceph] loaded 2:1 composite (b).

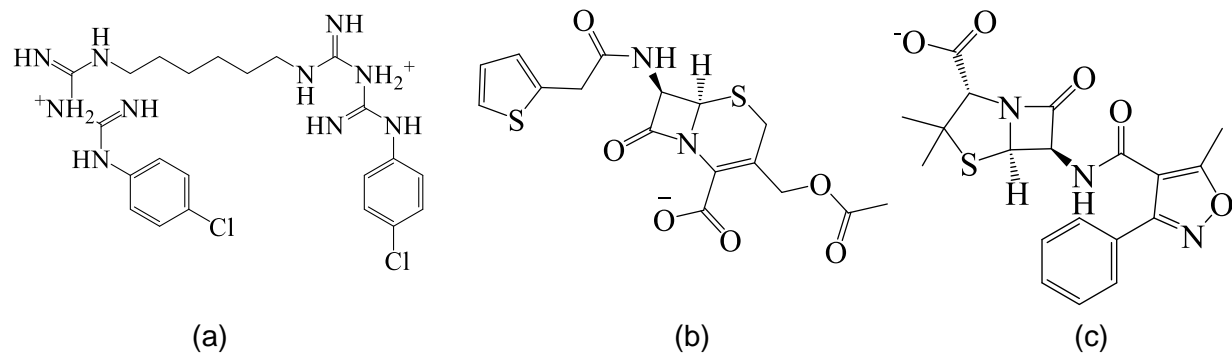


SI Figure 9. Dry 1:1 (HA:CEL) composite (a), and swollen 1:1 composite in 0.9% saline (b).

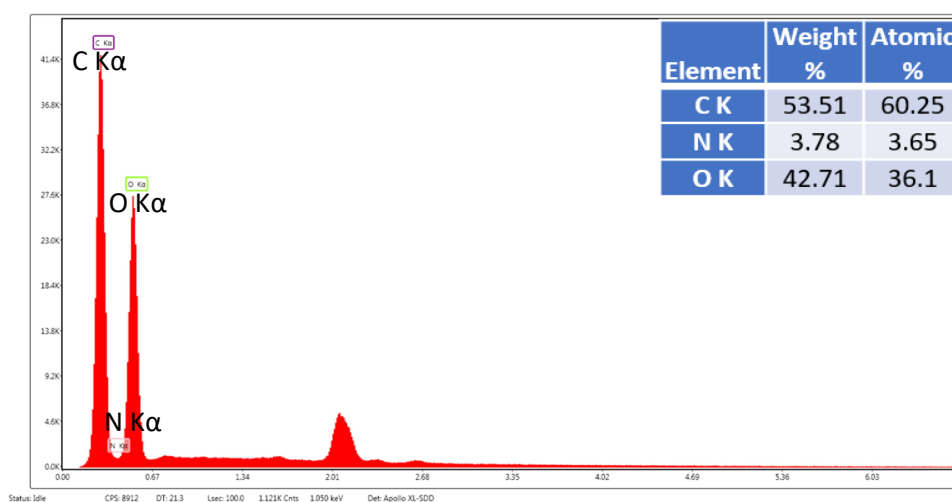


SI Figure 10. Dry 2:1 (HA:CEL) composite (a), and swollen 2:1 composite in 0.9% saline (b).

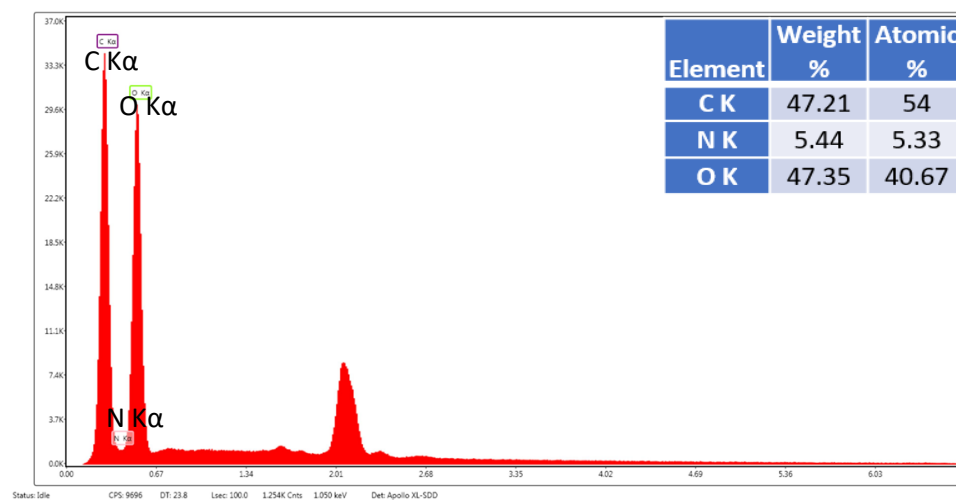
Photos taken by Kelsey M. Lopez.



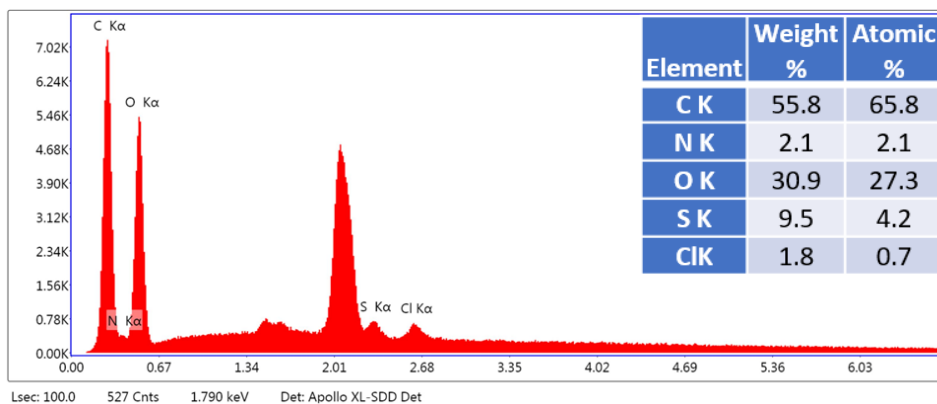
SI Figure 11. Structures of compounds used to synthesize GUMBOS. Chlorhexidine (a), cephalothin (b), and oxacillin (c).



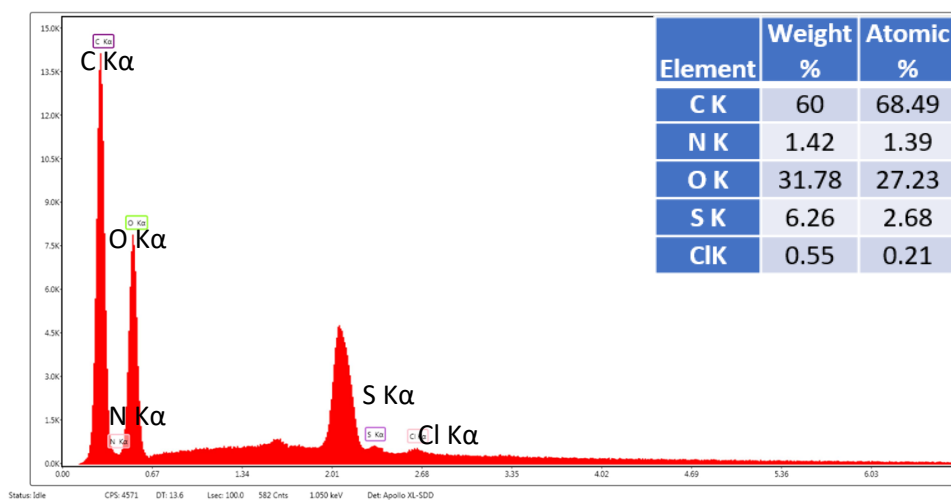
SI Figure 12. EDS spectrum of 1:1 HA:CEL composite.



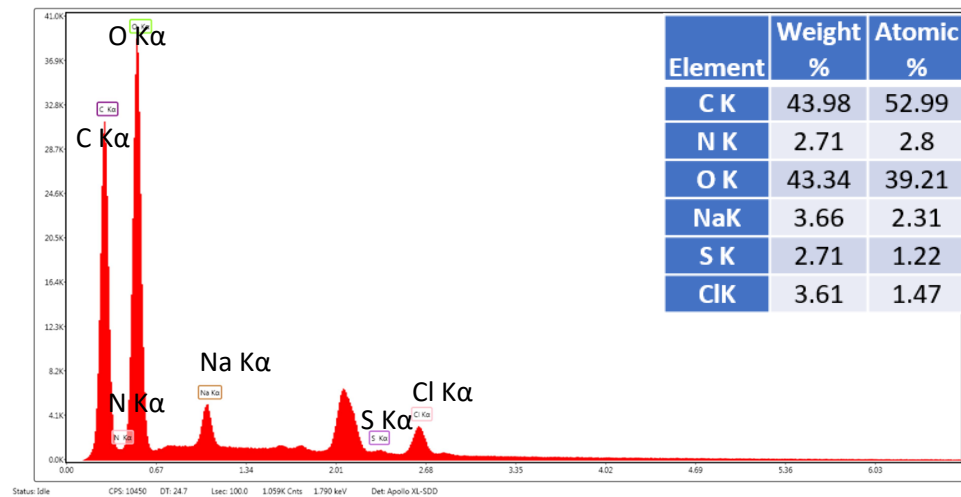
SI Figure 13. EDS spectrum of 2:1 HA:CEL composite.



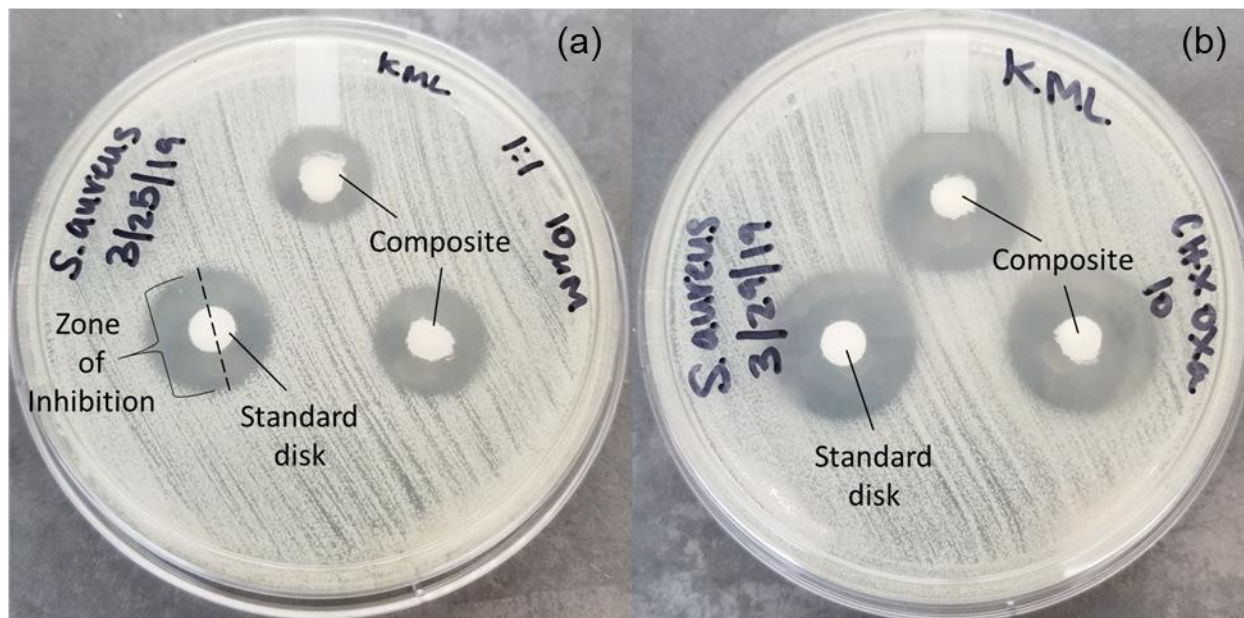
SI Figure 14. EDS spectrum of 1:1 composite drug-loaded with [CHX][Oxa] (100 μM).



SI Figure 15. EDS spectrum of 2:1 composite drug-loaded with [CHX][Oxa] (100 μM).



SI Figure 16. EDS spectrum of 2:1 drug-released composite (previously loaded with 100 μM [CHX][Oxa]). Presence of Na and Cl from 0.9% saline solution.



SI Figure 17. Representative images of composites and standard disks on agar plates after 20-24-hour incubation period; plates were inoculated with *S. aureus* (ATCC 29213). Circular areas where no bacteria have grown are called zones of inhibition (ZOI). 10 μM [CHX][Ceph] loaded 1:1 composite (a), and 10 μM [CHX][Oxa] loaded 1:1 composite (b).

Photo taken by Kelsey M. Lopez.