3D Printed Laminated CaCO$_3$-nanocellulose Films as Controlled-release 5-fluorouracil

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**Figure S1.** Casted films of (a) CNF, (b) CaCO$_3$ and (c) CaCO$_3$-CNF on the top of nylon membrane filter (47 mm diameter, 0.45 µm pore size) using vacuum filtration technique.
Figure S2. Liquid deposition modelling of 7 wt% CNF suspension followed by a standard tensile specimen 3D model according to the ASTM D638 Type IV (printing and slicing profiles; nozzle diameter: 1.21 mm; printing speed: 30 mm/s; extrusion speed: 3 mm/s; build plate temperature: 50 °C).
Table S1. One-way ANOVA results on kinetic release of 5-FU (%) for 24 h (Tukey Method; N: 3; α = 0.05; p ≤ 0.05; Equal variances were assumed for the analysis)

| Samples   | Time (h) | Mean   | StDev  | 95% CI               | Grouping |
|-----------|----------|--------|--------|----------------------|----------|
| CaCO₃     |          | 28.943 | 0.087  | (28.810, 29.076)     | A        |
| CaCO₃-CNF-DL |        | 26.800 | 0.108  | (26.666, 26.931)     | B        |
| CaCO₃-CNF-L | 1       | 24.043 | 0.131  | (23.910, 24.176)     | C        |
| CaCO₃-CNF-M |        | 15.437 | 0.070  | (15.303, 15.569)     | D        |
| CNF       |          | 8.857  | 0.111  | (8.723, 8.989)       | E        |
| CaCO₃     |          | 46.827 | 0.123  | (46.644, 47.009)     | A        |
| CaCO₃-CNF-DL |        | 40.963 | 0.140  | (40.781, 41.146)     | B        |
| CaCO₃-CNF-L | 2       | 39.620 | 0.170  | (39.437, 39.803)     | C        |
| CaCO₃-CNF-M |        | 30.200 | 0.125  | (30.017, 30.383)     | D        |
| CNF       |          | 12.613 | 0.146  | (12.431, 12.796)     | E        |
| CaCO₃     |          | 58.750 | 0.241  | (58.472, 59.028)     | A        |
| CaCO₃-CNF-DL |        | 47.727 | 0.158  | (47.441, 48.005)     | C        |
| CaCO₃-CNF-L | 3       | 53.647 | 0.267  | (53.368, 53.925)     | B        |
| CaCO₃-CNF-M |        | 41.677 | 0.229  | (41.398, 41.955)     | D        |
| CNF       |          | 16.350 | 0.165  | (16.072, 16.628)     | E        |
| CaCO₃     |          | 67.703 | 0.200  | (67.374, 68.033)     | A        |
| CaCO₃-CNF-DL |        | 52.043 | 0.212  | (51.714, 52.373)     | C        |
| CaCO₃-CNF-L | 4       | 63.003 | 0.366  | (62.674, 63.333)     | B        |
| CaCO₃-CNF-M |        | 51.513 | 0.274  | (51.184, 51.843)     | C        |
| CNF       |          | 18.847 | 0.182  | (18.517, 19.176)     | D        |
| CaCO₃     |          | 73.657 | 0.180  | (73.328, 73.985)     | A        |
| CaCO₃-CNF-DL |        | 52.957 | 0.240  | (52.628, 53.285)     | D        |
| CaCO₃-CNF-L | 5       | 69.237 | 0.377  | (68.908, 69.565)     | B        |
| CaCO₃-CNF-M |        | 58.727 | 0.284  | (58.398, 59.055)     | C        |
| CNF       |          | 20.723 | 0.117  | (20.394, 21.052)     | E        |
| CaCO₃     |          | 76.643 | 0.206  | (76.335, 76.952)     | A        |
| CaCO₃-CNF-DL |        | 53.880 | 0.207  | (53.572, 54.188)     | D        |
| CaCO₃-CNF-L | 6       | 73.920 | 0.272  | (73.612, 74.228)     | B        |
| CaCO₃-CNF-M |        | 62.987 | 0.322  | (62.678, 63.295)     | C        |
| CNF       |          | 20.723 | 0.157  | (20.415, 21.032)     | E        |
| CaCO₃     |          | 79.620 | 0.250  | (79.306, 79.934)     | A        |
| CaCO₃-CNF-DL |        | 54.803 | 0.263  | (54.490, 55.117)     | D        |
| CaCO₃-CNF-L | 7       | 76.407 | 0.310  | (76.093, 76.720)     | B        |
| CaCO₃-CNF-M |        | 65.283 | 0.220  | (64.970, 65.597)     | C        |
| CNF       |          | 21.350 | 0.144  | (21.037, 21.664)     | E        |
|       | CaCO₃  | CNF |   | A    |   | B    | C   | D   | E    |
|-------|--------|-----|---|------|---|------|-----|-----|------|
| 8     | 82.603 | 0.276 | (82.292, 82.915) |  | 78.587 | 0.203 | (78.275, 82.898) |  | 67.247 | 0.260 | (66.935, 67.558) |  | 21.967 | 0.129 | (21.655, 22.278) |
| CaCO₃-CNFDL | 55.110 | 0.305 | (54.799, 55.031) |  | 80.153 | 0.211 | (79.873, 80.434) |  | 69.550 | 0.211 | (69.269, 69.831) |  | 22.973 | 0.121 | (22.694, 23.254) |
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|          |       |        |               |      |  |
|----------|-------|--------|---------------|------|---|
| CaCO₃    | 15    | 90.650 | 0.160         | (90.254, 91.045) | A  |
| CaCO₃-CNFDL | 69.880 | 0.278  | (69.484, 70.276) | D    |   |
| CaCO₃-CNFDL | 87.013 | 0.382  | (86.617, 87.409) | B    |   |
| CaCO₃-CNFM | 79.380 | 0.320  | (78.984, 79.776) | C    |   |
| CNF      |       | 25.217 | 0.349         | (24.821, 25.613) | E  |

| CaCO₃    | 16    | 90.193 | 0.168         | (90.795, 91.590) | A  |
| CaCO₃-CNFDL | 74.500 | 0.214  | (74.103, 74.897) | D    |   |
| CaCO₃-CNFDL | 87.323 | 0.398  | (86.926, 87.721) | B    |   |
| CaCO₃-CNFM | 80.373 | 0.423  | (79.976, 80.771) | C    |   |
| CNF      |       | 25.593 | 0.257         | (25.196, 25.991) | E  |

| CaCO₃    | 17    | 91.193 | 0.168         | (90.796, 91.591) | A  |
| CaCO₃-CNFDL | 74.500 | 0.214  | (74.103, 74.897) | D    |   |
| CaCO₃-CNFDL | 87.323 | 0.398  | (86.926, 87.721) | B    |   |
| CaCO₃-CNFM | 80.373 | 0.423  | (79.976, 80.771) | C    |   |
| CNF      |       | 25.593 | 0.257         | (25.196, 25.991) | E  |

| CaCO₃    | 18    | 91.207 | 0.182         | (90.933, 91.480) | A  |
| CaCO₃-CNFDL | 78.447 | 0.236  | (78.173, 78.720) | D    |   |
| CaCO₃-CNFDL | 87.753 | 0.208  | (87.480, 88.027) | B    |   |
| CaCO₃-CNFM | 81.370 | 0.236  | (81.097, 81.643) | C    |   |
| CNF      |       | 26.090 | 0.193         | (25.817, 26.363) | E  |

| CaCO₃    | 19    | 91.217 | 0.170         | (90.939, 91.494) | A  |
| CaCO₃-CNFDL | 79.117 | 0.212  | (78.839, 79.394) | D    |   |
| CaCO₃-CNFDL | 87.837 | 0.238  | (87.559, 88.114) | B    |   |
| CaCO₃-CNFM | 81.390 | 0.183  | (81.112, 81.668) | C    |   |
| CNF      |       | 26.213 | 0.263         | (25.936, 26.491) | E  |

| CaCO₃    | 20    | 91.223 | 0.215         | (90.832, 91.615) | A  |
| CaCO₃-CNFDL | 80.653 | 0.404  | (80.262, 81.045) | C    |   |
| CaCO₃-CNFDL | 87.937 | 0.348  | (87.545, 88.328) | B    |   |
| CaCO₃-CNFM | 81.393 | 0.274  | (81.002, 81.785) | C    |   |
| CNF      |       | 26.340 | 0.238         | (25.949, 26.731) | D  |

| CaCO₃    | 21    | 91.263 | 0.240         | (90.861, 91.665) | A  |
| CaCO₃-CNFDL | 83.733 | 0.406  | (83.331, 84.135) | C    |   |
| CaCO₃-CNFDL | 88.257 | 0.392  | (87.855, 88.659) | B    |   |
| CaCO₃-CNFM | 81.457 | 0.211  | (81.055, 81.859) | D    |   |
| CNF      |       | 26.717 | 0.260         | (26.315, 27.119) | E  |
| Sample Type       | Mean   | SE     | CI                | Letter |
|-------------------|--------|--------|-------------------|--------|
| CaCO$_3$          | 91.330 | 0.185  | (90.960, 91.700)  | A      |
| CaCO$_3$-CNF-DL   | 85.877 | 0.342  | (85.507, 86.246)  | C      |
| CaCO$_3$-CNF-L    | 88.573 | 0.382  | (88.204, 88.943)  | B      |
| CaCO$_3$-CNF-M    | 81.677 | 0.214  | (81.307, 82.046)  | D      |
| CNF               | 27.093 | 0.265  | (26.724, 27.463)  | E      |
| CaCO$_3$          | 91.353 | 0.227  | (90.982, 91.724)  | A      |
| CaCO$_3$-CNF-DL   | 88.350 | 0.356  | (87.979, 88.721)  | B      |
| CaCO$_3$-CNF-L    | 88.610 | 0.314  | (88.239, 88.981)  | B      |
| CaCO$_3$-CNF-M    | 82.010 | 0.241  | (81.639, 82.381)  | C      |
| CNF               | 27.473 | 0.284  | (27.102, 27.844)  | D      |
| CaCO$_3$          | 91.367 | 0.157  | (91.006, 91.727)  | A      |
| CaCO$_3$-CNF-DL   | 89.877 | 0.370  | (89.516, 90.237)  | B      |
| CaCO$_3$-CNF-L    | 88.630 | 0.348  | (88.269, 88.991)  | C      |
| CaCO$_3$-CNF-M    | 82.060 | 0.210  | (81.699, 82.421)  | D      |
| CNF               | 27.837 | 0.257  | (27.476, 28.197)  | E      |

Means that do not share a letter are significantly different; $p < 0.05$