Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary Information

Electrically Controlled Drug Release Using pH-Sensitive Polymer Films

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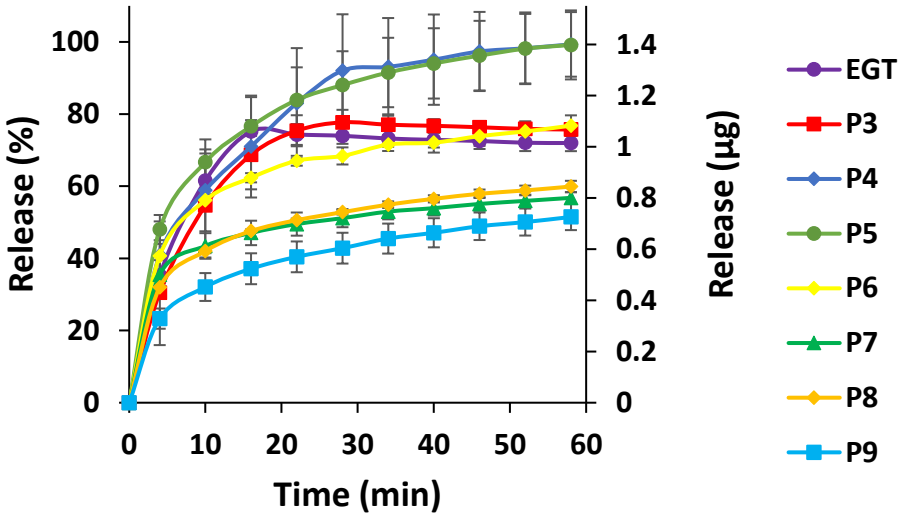
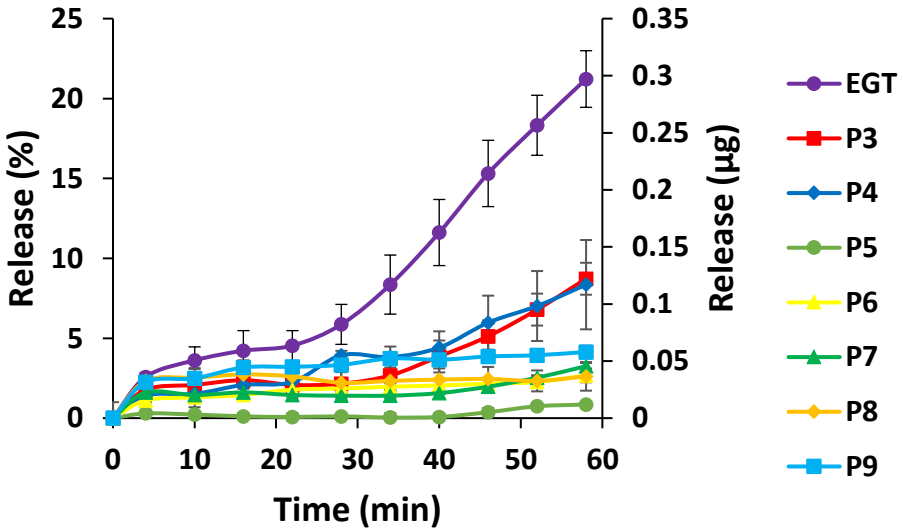
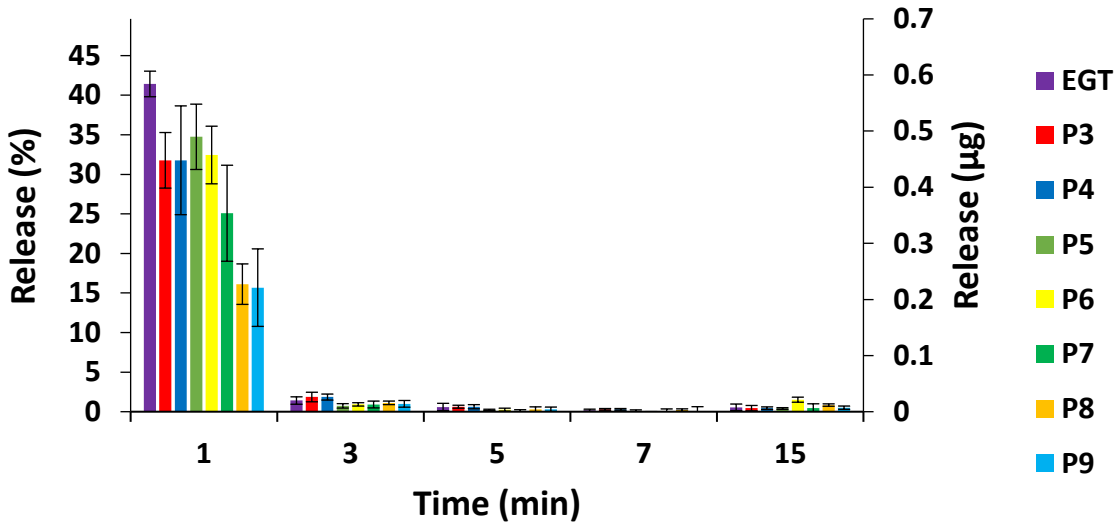


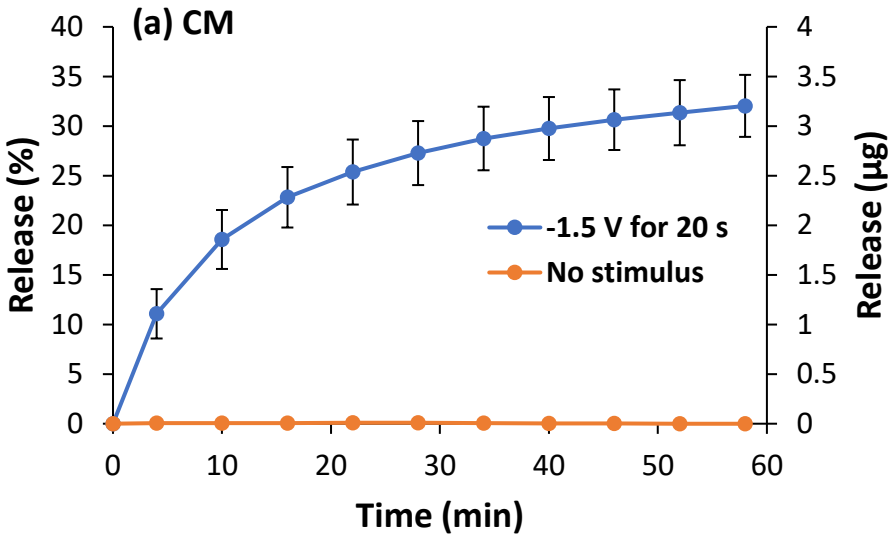
Supplementary Figure 1: Release of FL for EGT and every synthezied *co*-PMMA with FL as drug surrogate for 10 pulses of -1.5 V for 20 s each every 6 min.

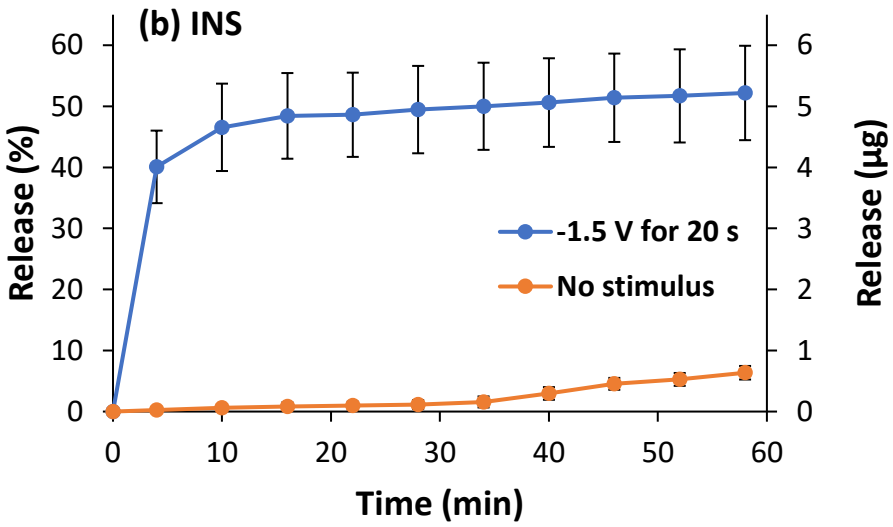


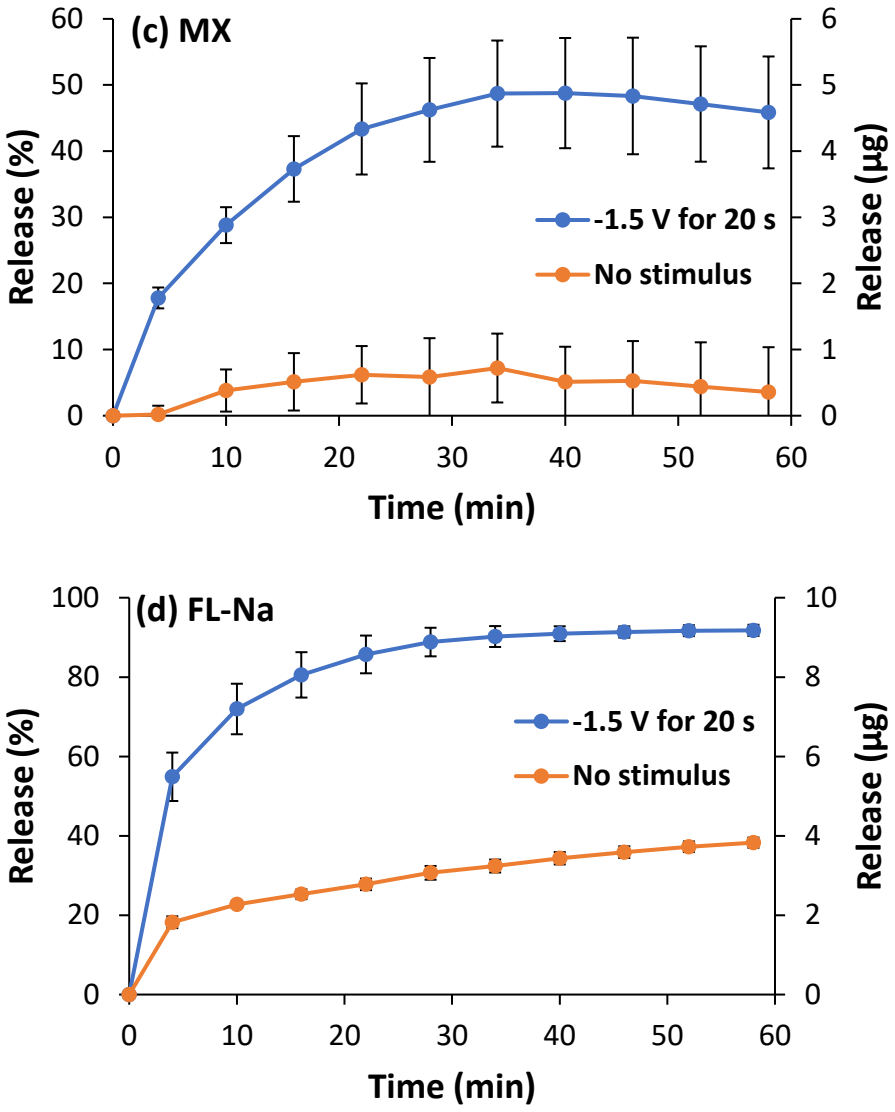
Supplementary Figure 2: Leakage of FL for EGT and every synthezied *co*-PMMA with FL as drug surrogate for an hour, measured every 6 min.



Supplementary Figure 3: Timed release pattern of FL after a single electric stimulus of -1.5 V for 60 s for every synthesized *co*-PMMA.


(a) CM
Release (%)
Release (µg)
Time (min)
-1.5 V for 20 s
No stimulus
0
5
10
15
20
25
30
35
40
0
0.5
1
1.5
2
2.5
3
3.5
4
0
10
20
30
40
50
60


(b) INS
Release (%)
Release (µg)
Time (min)
-1.5 V for 20 s
No stimulus
0
10
20
30
40
50
60
0
1
2
3
4
5
6
0
10
20
30
40
50
60



Supplementary Figure 4: Pulsed release and leakage with -1.5 V for 20 s each of (a) CM, (b) INS, (c) MX, and (d) FL-Na with **P5** as carrier-polymer.

Supplementary Table 1: Molar masses (M_w and M_z) for EGT and every synthesized *co*-PMMA, measured by GPC.

Polymer	Eudragit	P3	P4	P5	P6	P7	P8	P9
Ratio (AA:MMA)	1:2	1:3	1:4	1:5	1:6	1:7	1:8	1:9
M_w / g mol^{-1}	$1.816 \cdot 10^5$ (± 0.200 %)	$7.374 \cdot 10^4$ (± 0.226 %)	$6.959 \cdot 10^4$ (± 0.332 %)	$5.734 \cdot 10^4$ (± 0.409 %)	$5.256 \cdot 10^4$ (± 0.433 %)	$5.129 \cdot 10^4$ (± 0.604 %)	$5.167 \cdot 10^4$ (± 0.237 %)	$5.894 \cdot 10^4$ (± 0.183 %)
M_z / g mol^{-1}	$1.506 \cdot 10^6$ (± 0.486 %)	$2.257 \cdot 10^5$ (± 0.565 %)	$2.956 \cdot 10^5$ (± 0.911 %)	$1.509 \cdot 10^5$ (± 1.195 %)	$1.430 \cdot 10^5$ (± 1.182 %)	$1.386 \cdot 10^5$ (± 1.524 %)	$1.373 \cdot 10^5$ (± 0.561 %)	$1.591 \cdot 10^5$ (± 0.468 %)