Design of molecularly imprinted conducting polymer protein-sensing films via substrate-dopant binding
Supplementary Information

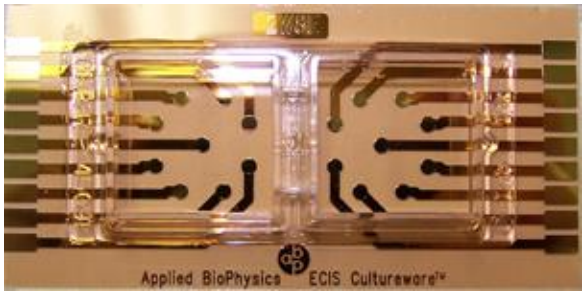


Figure S1. Custom-made array electrode. Gold-sputtered array electrode on plastic support with attached dual chamber used for electrochemical polymerization and testing of MICP films. Each side has 8 working electrodes (2mm diameter), positioned in a circle around the central electrode, which can be used as a counter or as additional working electrode, depending on a setup. The two sides are modified and measured independently in separate experiments. Individual electrodes modifications and incubations are carried out in 5 - 7 µl drops. For electrochemical measurement the chamber is filled with electrolyte and fitted with a reference and a counter electrode. The array format allowed testing nine MICP films of different formulations in one experiment in equivalent conditions, along with the negative controls, offering rapid acquisition of experimental data.

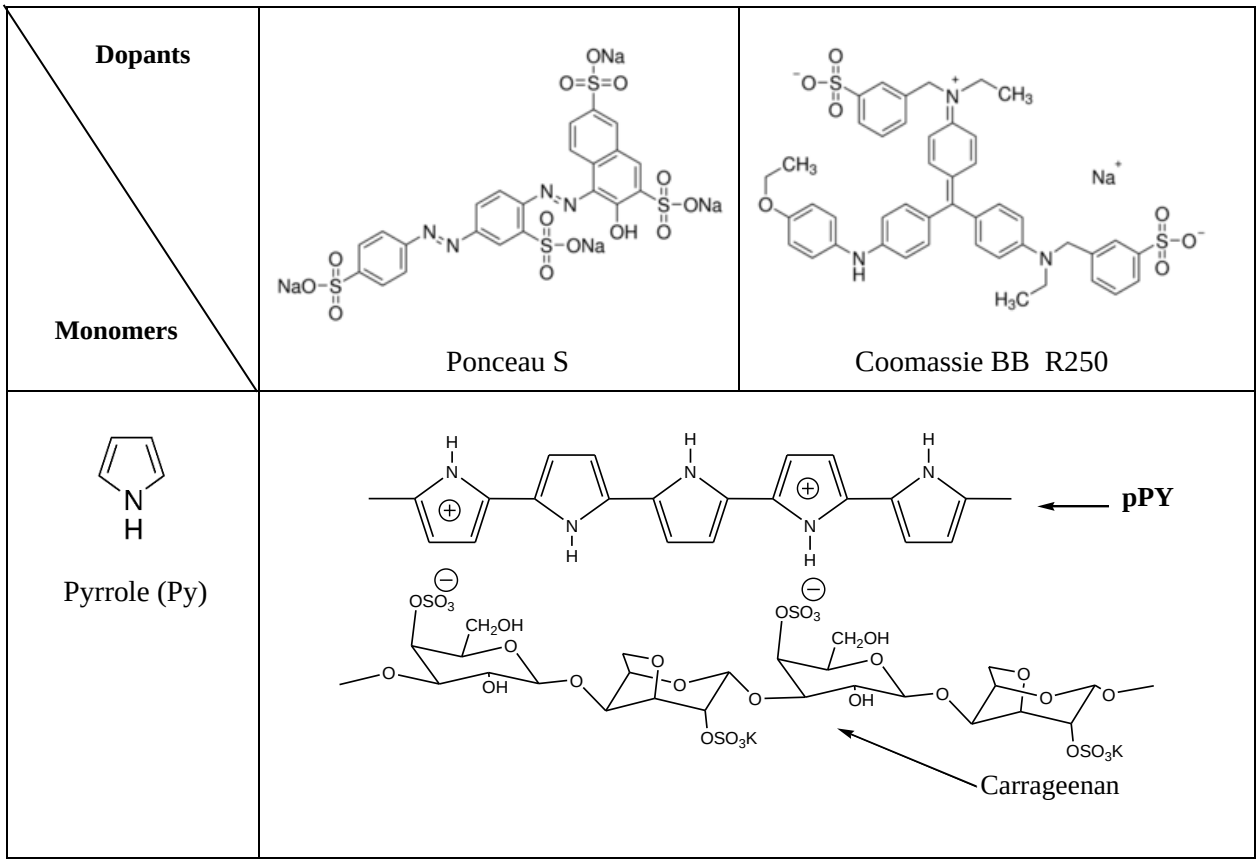


Figure S2. Components used in MICP film preparations

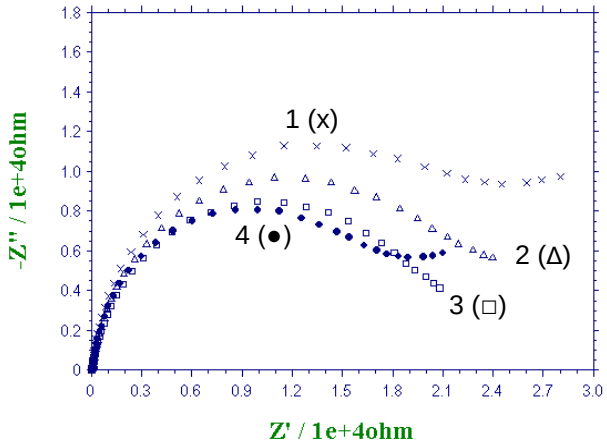


Figure S3. Overoxidation of MICP pPy/Coomassie film imprinted with RTA. 1: after pPy polymerization by CV; 2 and 3: two steps of overoxidation, 1 V for 1 min. each; 4: after protease treatment 2 h. and repeated PBS/SDS wash.

Impedance overlays of MICP films (RTA-imprinted pPy) before (○) and after interaction with analytes (1st incubation of the 9-electrode array)

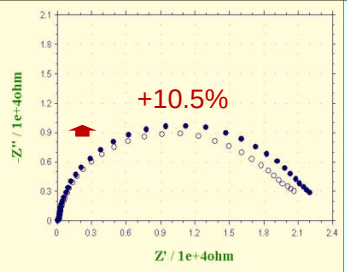
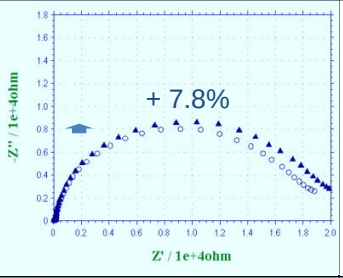
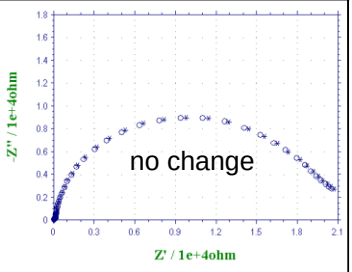
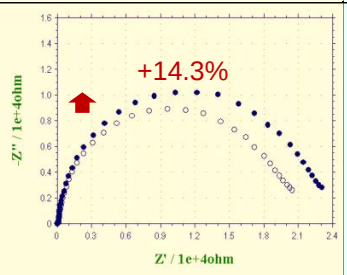
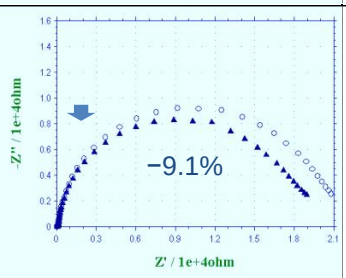
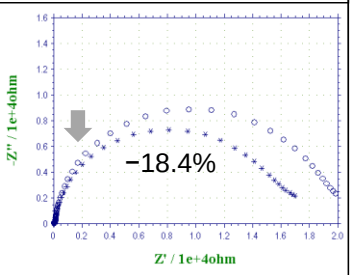
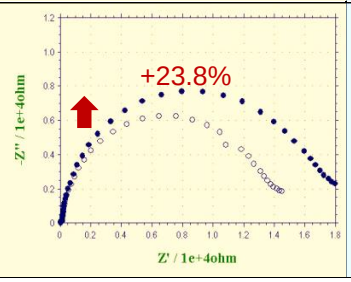
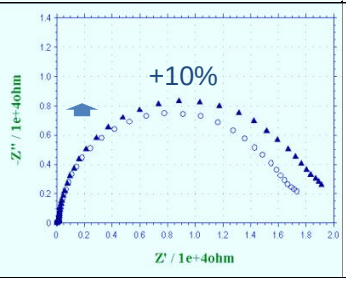
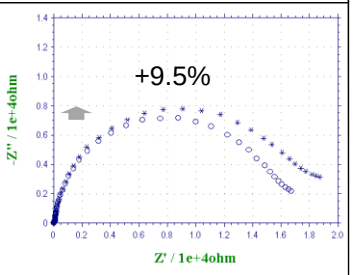
	1 µg/ml RTA ●	10 µg/ml BSA ▲	Buffer *
pPy/ Panceau			
pPy/ Coomassie			
pPy/ Carrageenan			

Figure S4. AC Impedance data as overlaid Nyquist plots obtained on MICP Array. RTA-imprinted pPy films obtained with various dopants on the array electrode were incubated for 30 min. with 1 µg/ml RTA, 10 µg/ml BSA as nonspecific control, or binding buffer. Impedance was measured before and after the incubation in the presence of 2.5 mM each Fe (II)/Fe(III) in PBS.

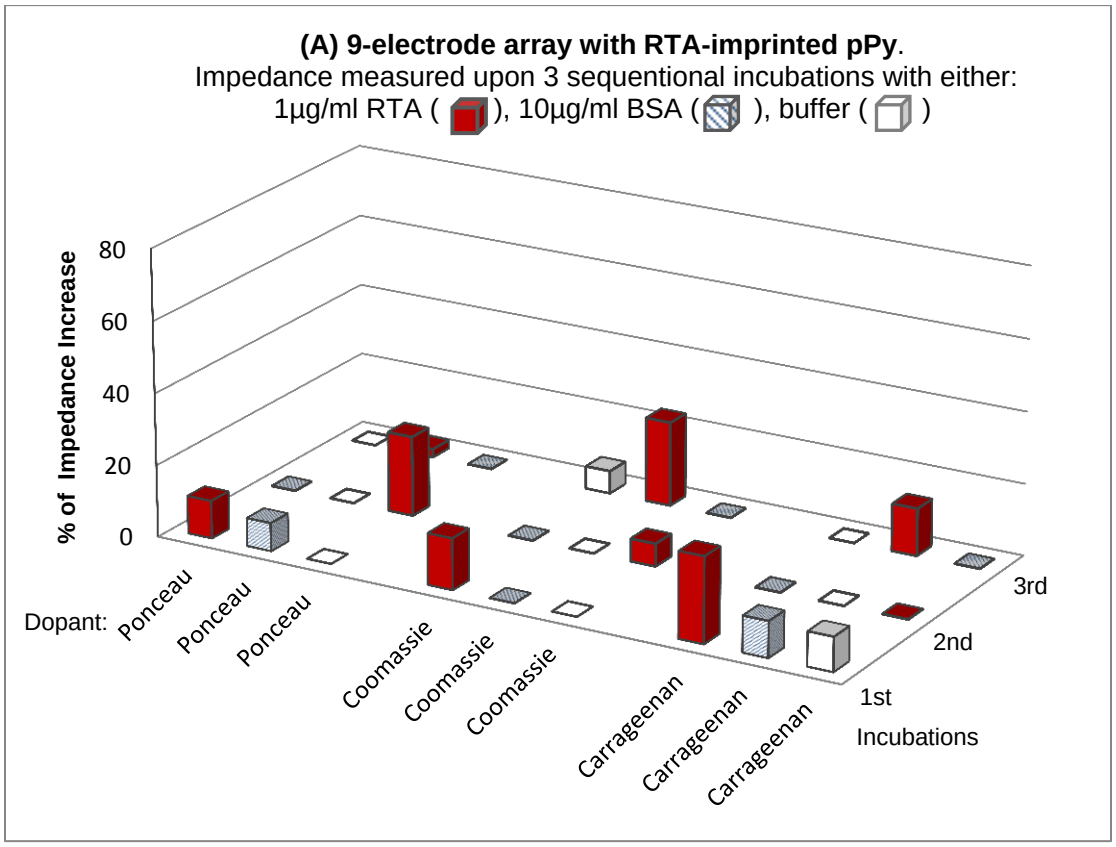


Figure S5. Specificity of RTA-imprinted MICP array towards RTA measured as % of Impedance increase, three consecutive incubations. pPy/ RTA-imprinted films obtained with various dopants on the array electrodes were incubated for 30 min. in either 1 µg/ml RTA, 10 µg/ml of BSA as nonspecific control, or binding buffer. Impedance was measured before and after the incubation. Protein binding to the MICP films calculated as % of Increase of -Z" values was plotted for each set.

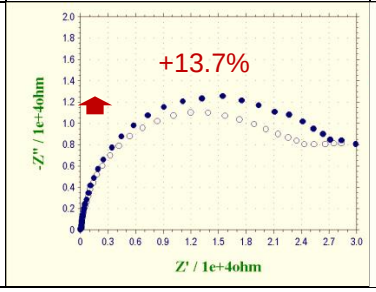
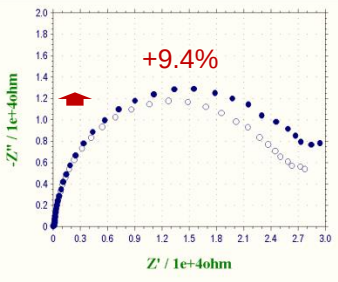
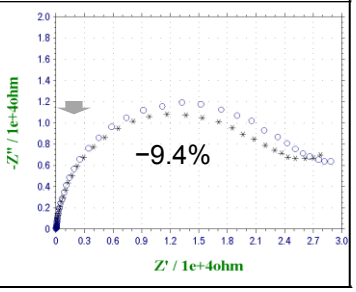
	RTA-imprinted pPy/Coomassie MICP, LOD determination		
	RTA 10ng/ml ●	**RTA 0.1ng/ml ●**	**Buffer ***
pPy/ Coomassie			

Figure S6. LOD determination. RTA-imprinted pPy/Coomassie films were exposed to dilutions of RTA to detect LOD. Impedance overlay before (○) and after (●) exposure to 10 ng/ml and 0.1 ng/ml RTA for 30 min. AC Impedance was measured in the presence of 2.5 mM each Fe(II)/ Fe(III) in PBS. Relative Impedance increase, resulting from RTA binding was measured as % (ΔZ").

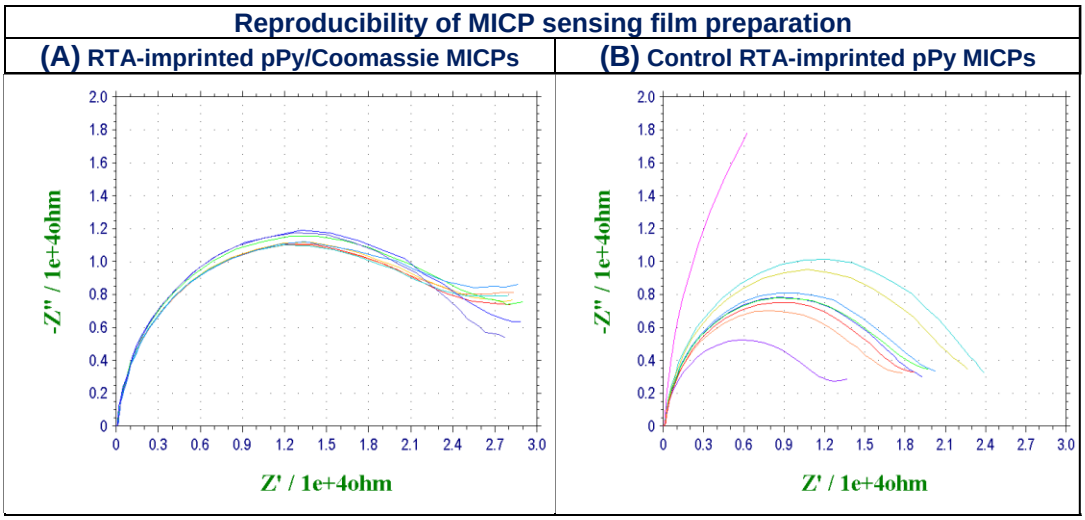


Figure S7. Using macromolecular dopants increases MICP reproducibility. MICP films were prepared on array electrodes in identical conditions except for Coomassie dopant. AC Impedance data as overlaid Nyquist plots obtained from **(A)** eight RTA-imprinted pPy/Coomassie MICPs and **(B)** nine RTA-imprinted pPy, all after proteinase K digestion and PBS/ Tween wash. Impedance was measured in the presence of 2.5 mM each Fe (II)/ Fe(III) in PBS.

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