

Supporting Information

Carboxylated cellulose as soft template combined with PEDOT derivatives in [BMIM]Cl: a competent biosensor for detection of guanine and uric acid in the blood

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Preparation of the EDOT-MeCl

EDOT-MeCl: 3,4-dimethoxythiophene (1.64 g, 5.7 mmol), 3-chloro-1,2-propanediol (2.6 g, 12 mmol), toluene (28 mL) and p-toluene sulfonic acid monohydrate (0.16 g, 0.42 mmol) were added sequentially to a two-neck flask. The mixture was stirred at 95°C for 24 h under a nitrogen atmosphere. And 3-chloro-1,2-propanediol (2.6 g, 12mmol) was added again to the mixture, and the mixture was refluxed for an additional 3 h at 95 °C. After removal of the solvent, a white solid (yield 60%) of chloromethyl-EDOT was obtained by column chromatography (silica gel, volumeratio of hexane/DCM = 4:1).

FT-IR and UV-vis

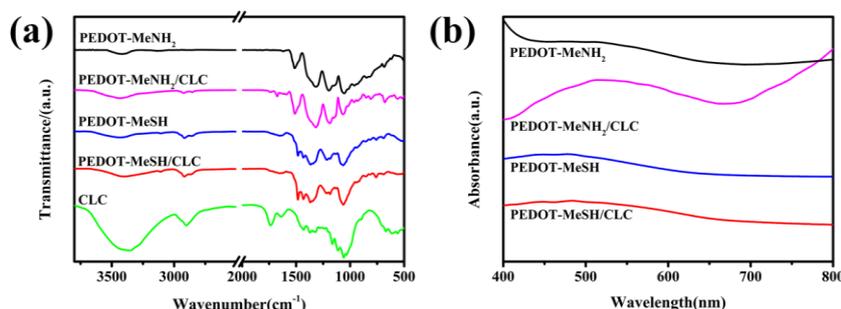


Fig. S1. (a) FT-IR spectra and (b) UV-Vis spectra of PEDOT-MeNH₂, PEDOT-MeSH, CLC and their composites;

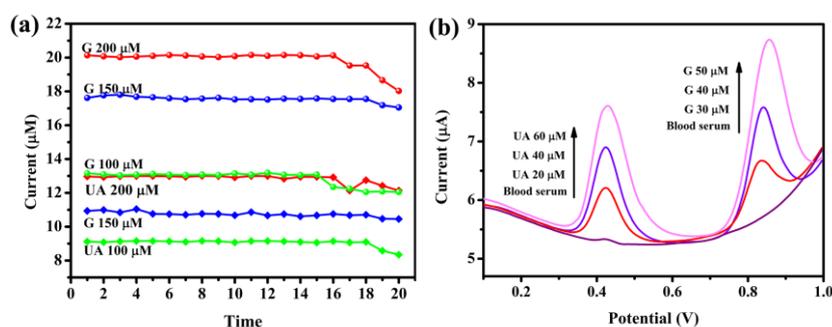


Fig. S2. (a) Reusability of guanine and uric acid with PEDOT-MeSH/CLC modified GCE; (b) Real sample analysis of guanine and uric acid.

Table S1

The reusability of the PEDOT-MeSH/CLC modified GCE toward uric acid and guanine detection.

Time	GCE1 (μA)		GCE2 (μA)		GCE3 (μA)	
	Uricacid	Guanine	Uric acid	Guanine	Uric acid	Guanine
	(100 μM)	(100 μM)	(150 μM)	(150 μM)	(200 μM)	(200 μM)
1	9.12	13.15	10.93	17.61	12.97	20.13
2	9.08	13.09	10.99	17.76	12.93	20.07
3	9.13	13.04	10.84	17.80	12.98	20.02
4	9.14	13.07	11.03	17.68	12.99	20.05
5	9.15	13.11	10.75	17.65	12.99	20.09
6	9.13	13.06	10.74	17.59	12.98	20.14
7	9.10	13.05	10.70	17.54	12.94	20.12
8	9.15	13.08	10.76	17.57	13.00	20.06
9	9.14	13.14	10.75	17.61	12.99	20.02
10	9.06	13.15	10.67	17.52	12.91	20.15
11	9.14	13.07	10.86	17.53	12.97	20.09
12	9.16	13.18	10.65	17.51	12.99	20.14
13	9.13	13.09	10.72	17.56	12.83	20.13
14	9.09	13.05	10.60	17.55	12.94	20.06
15	9.05	13.08	10.56	17.58	12.95	20.15

Table S2

The reproducibility of the PEDOT-MeSH/CLC modified differerant GCE toward uric acid (100 μM) and guanine (100 μM) detection.

Analyte	Current (μA) (PEDOT-MeSH/CLC/GCE1-5)					RSD (%)
	1	2	3	4	5	
Uric acid	9.35	8.97	9.26	9.11	8.85	2.24
Guanine	13.21	13.31	12.85	13.06	12.6	2.19

Table S3

The repeatability of the PEDOT-MeSH/CLC modified GCE toward uric acid (50 μM) and guanine (50 μM) detection.

Analyte	Current (μA) (Time1-10)										RSD (%)
	1	2	3	4	5	6	7	8	9	10	
Uric acid	7.30	7.26	7.31	7.32	7.32	7.25	7.27	7.33	7.32	7.24	1.38
Guanine	8.53	8.47	8.42	8.45	8.49	8.44	8.43	8.46	8.42	8.41	1.31

Table S4

The repeatability of the PEDOT-MeSH/CLC modified GCE toward uric acid (100 μM) and guanine (100 μM) detection.

Analyte	Current (μA) (Time1-10)										RSD (%)
	1	2	3	4	5	6	7	8	9	10	
Uric acid	9.06	9.13	9.15	9.09	8.95	8.83	9.14	9.08	9.12	8.89	1.25
Guanine	13.3	13.15	13.11	13.07	13.09	12.8	12.86	12.93	13.04	13.5	1.57

Table S5

The repeatability of the PEDOT-MeSH/CLC modified GCE toward uric acid (150 μM) and guanine (150 μM) detection.

Analyte	Current (μA) (Time1-10)										RSD (%)
	1	2	3	4	5	6	7	8	9	10	
Uric acid	11.1	10.93	10.76	10.7	10.85	10.7	10.65	10.58	10.6	10.8	1.6
Guanine	17.6	17.59	17.79	17.9	17.58	17.5	17.8	17.66	17.4	17.3	2.6

Table S6

Detection of uric acid and guanine in human serum

	Uric acid			Guanine		
Spiked(μM)	20	40	60	30	40	50
Found(μM)	19.8	39.3	58.6	29.3	39.2	51.4
Recovery(%)	99	98	97.7	97.6	98	102