Supporting Information

Quantitative Determination of Leukocyte Esterase with a Paper-Based Device

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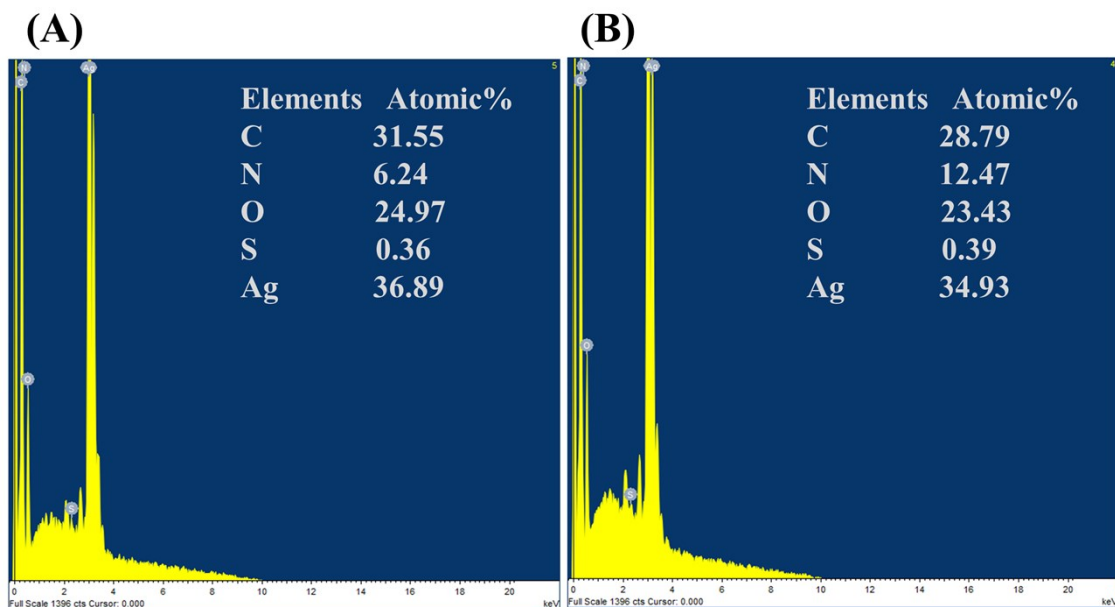
Supplementary materials:

(A)

Elements	Atomic%
C	31.55
N	6.24
O	24.97
S	0.36
Ag	36.89

Full Scale 1396 cts Cursor: 0.000   keV

(B)

Elements	Atomic%
C	28.79
N	12.47
O	23.43
S	0.39
Ag	34.93

Full Scale 1396 cts Cursor: 0.000   keV

Figure S1. The EDS spectra of (A) PE/DAS/Ag film and (B) LE/PE/DAS/Ag film.
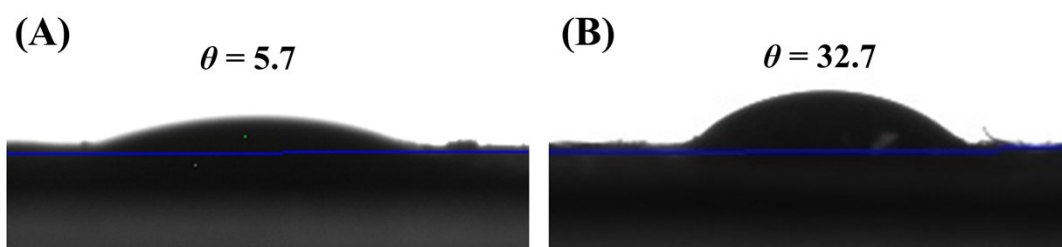
(A) $\theta = 5.7$ **(B)** $\theta = 32.7$

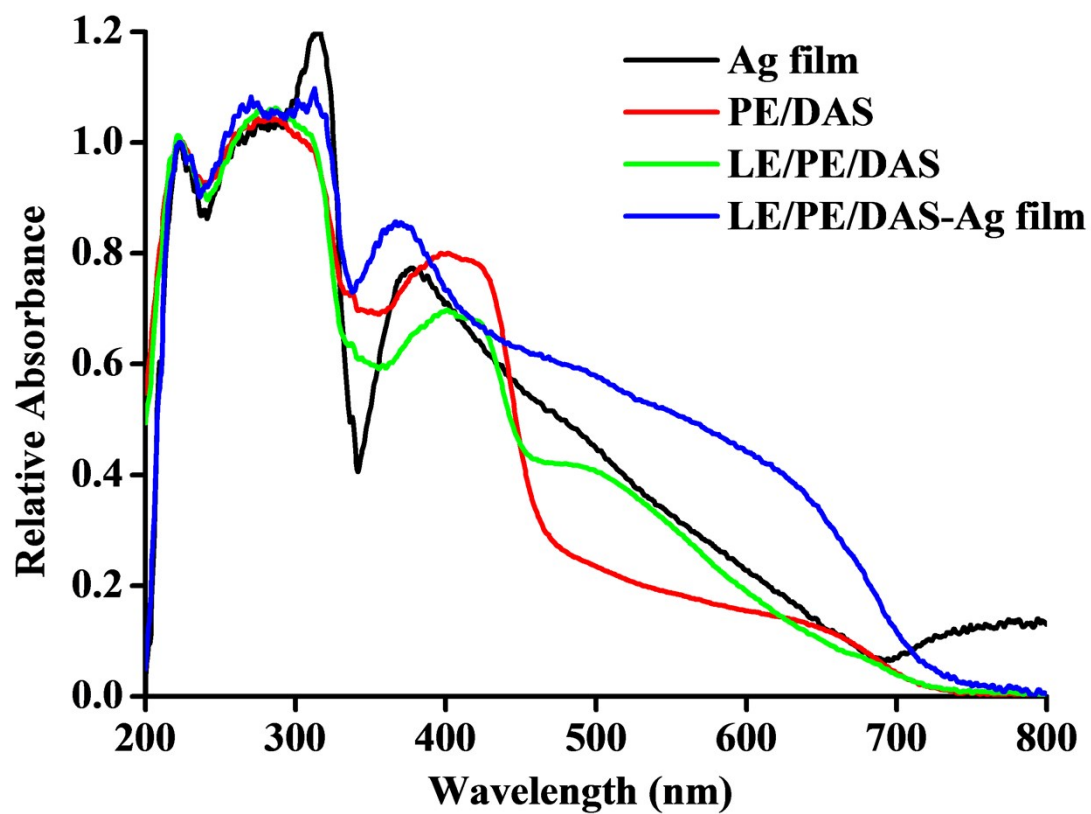**Figure S2.** The contact angle of the (A) Ag ink surface; (B) Ag film surface.

Figure S3. UV-Vis absorption spectra of the Ag film, PE/DAS, LE/PE/DAS and LE/PE/DAS/Ag film.
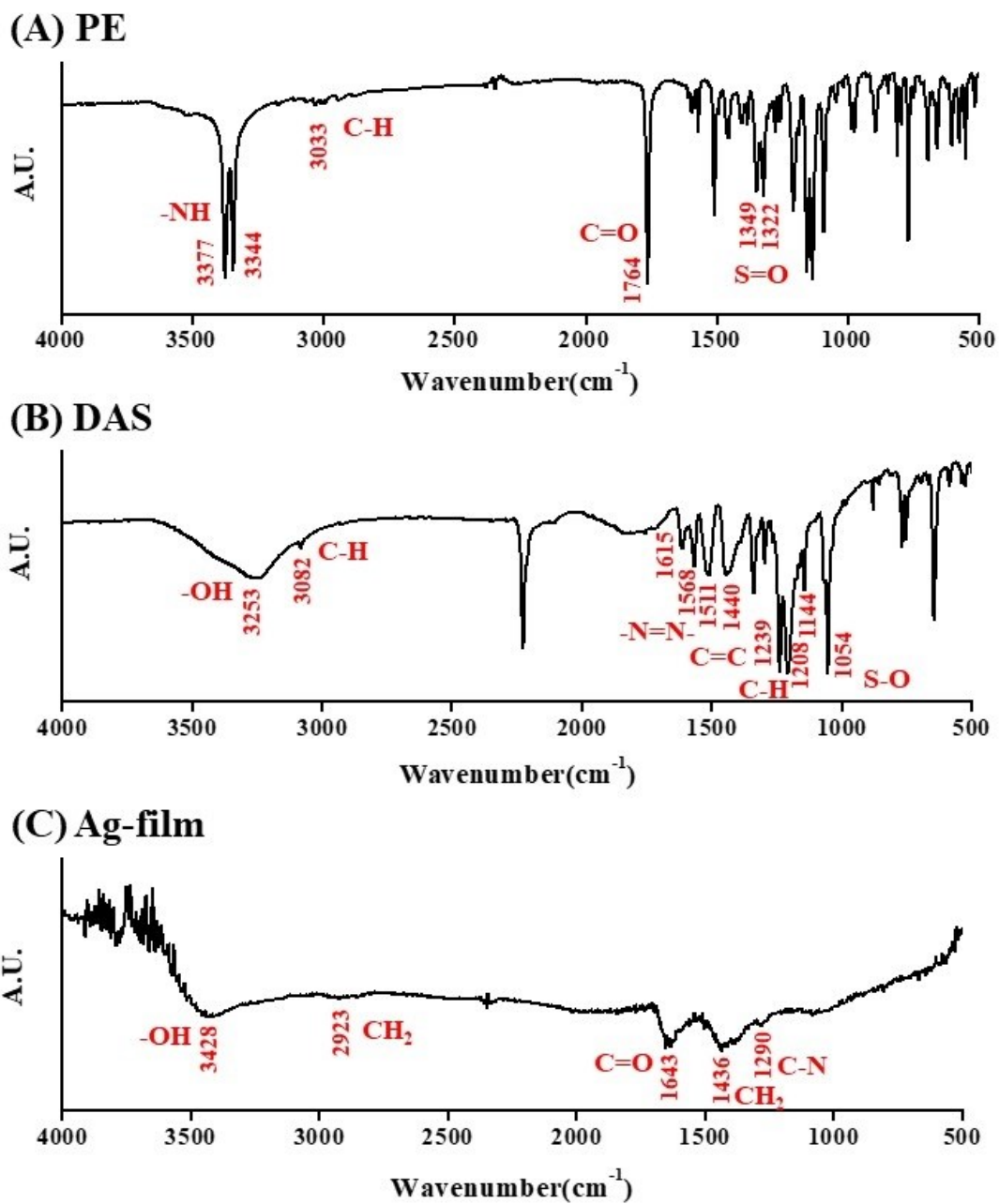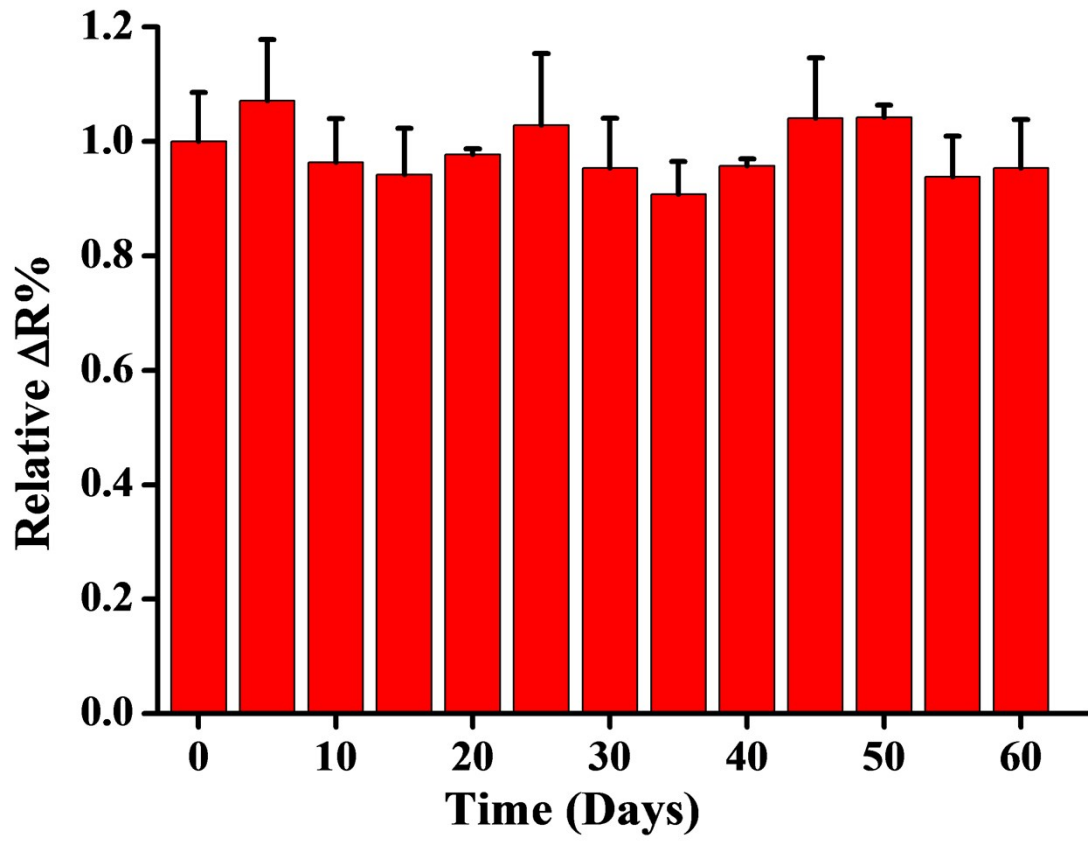
Figure S4. IR spectra of PE, DAS and Ag film.

Figure S5. The storage test (N = 3).

Table S1. The potential interferent concentrations in human urine.

Constituents	Concentration	
	Healthy individual	**The test in our method**
Uric acid	2 mM[1]	
Ascorbic acid	4.6 - 78.0 μM[2]	
Aspartic acid	10.9 mM[2]	
Glutathion acid	0.065 μM[3]	
Urea	12.285 mM[2]	
KCl	1 mM[2]	Each one is 10 mM
Methionine	1 μM[4]	
Tryptophan	7.8 mM[4]	
Valine	3.4 μM[4]	
Glycine	100 μM[2]	
Glucose	12.5 - 58.4 μM[2]	

Table S2. Interpretation of individual LE levels detected by LE-PADs and its association with clinical diagnosis of urinary tract infection (UTI).

sample	LE-PAD level[a]	LE-PAD positive[b]	Clinical UTI diagnosis	leukocyte/high power filed
1	2.60	No	Yes	>100
2	8.00	Yes	Yes	>100
3	8.00	Yes	Yes	>100
4	7.73	Yes	Yes	50-99
5	7.73	Yes	Yes	50-99
6	7.91	Yes	Yes	50-99
7	8.00	Yes	Yes	20-29
8	8.00	Yes	Yes	20-29
9	6.64	No	No	6-9
10	1.98	No	No	6-9
11	1.73	No	No	6-9
12	8.00	Yes	No	6-10
13	2.52	No	No	6-10
14	4.75	No	No	3-5
15	4.37	No	No	0-5
16	3.01	No	No	0-5
17	7.35	No	No	0-5
18	4.46	No	No	0-5
19	7.46	No	No	0-5
20	2.44	No	No	0-2
21	0.46	No	No	0-2

[a]$(x\ 5.1\ U\ mg^{-1}\ mL^{-1})$

[b]tested positive if the LE level > cut-off point of 7.60 $(x\ 5.1\ U\ mg^{-1}\ mL^{-1})$

Table S3. Statistical analysis of urine samples tested by LE-PADs device

1) Raw data	UTI diagnosis	No UTI	Totals
Test Positive	7	1	8
Test Negative	1	12	13
Totals	8	13	21

2) Analysis result	Point Estimate	Lower CI	Upper CI
Sensitivity	0.875	0.86767	0.88233
Specificity	0.92308	0.91844	0.92771
Positive Predictive Value	0.875	0.86767	0.88233
Negative Predictive Value	0.92308	0.91844	0.92771
3) Diagnostic Value	Point Estimate	Lower CI	Upper CI
Positive Likelihood Ratio	11.375	10.70369	12.08842
Negative Likelihood Ratio	0.13542	0.12767	0.14363

UTI indicates urinary tract infection; CI, 95% confidence intervals (alpha=0.05).

References:
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