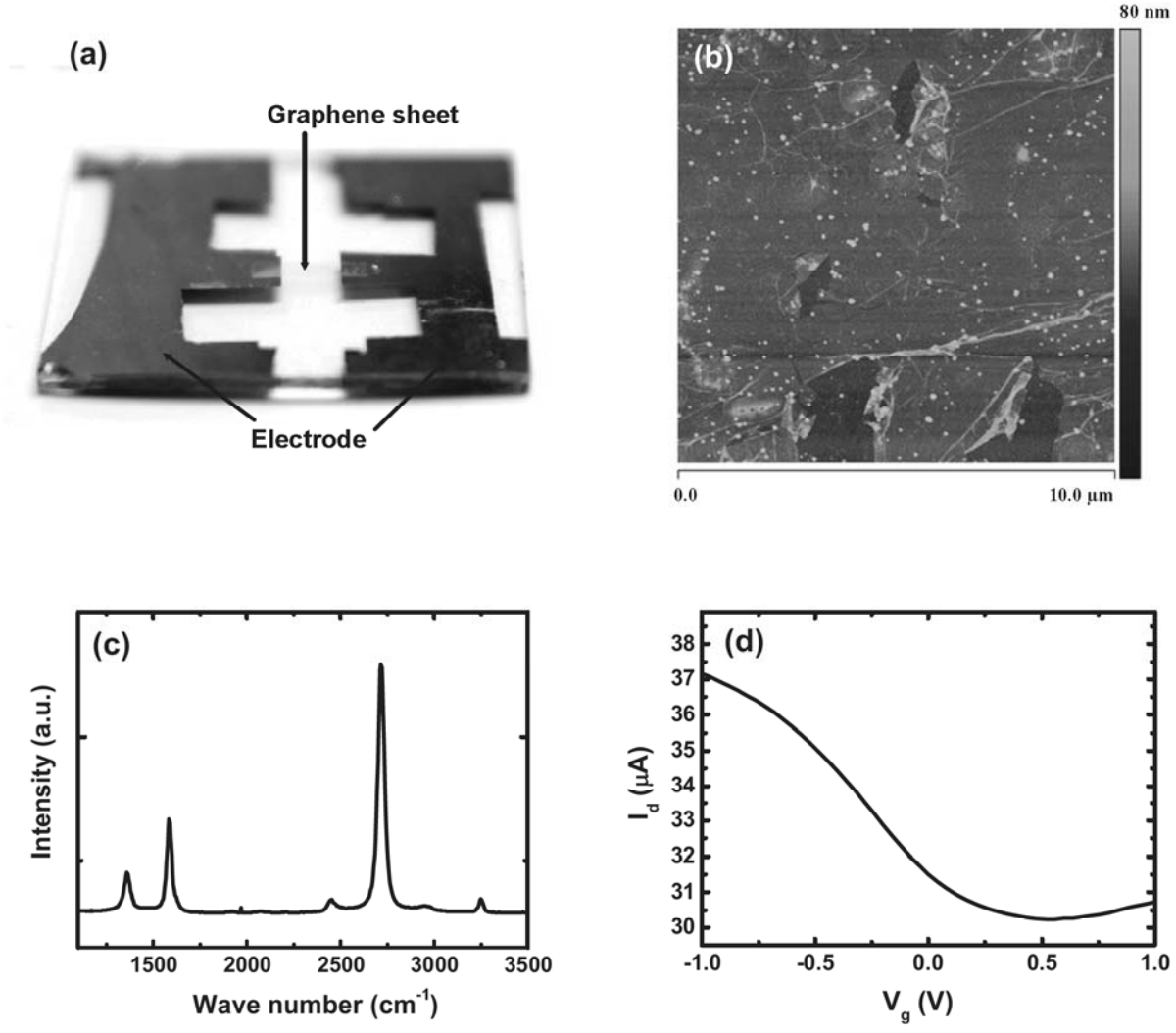

(a)
Graphene sheet
Electrode
(b)
80 nm
0.0
10.0 μm
(c)
Intensity (a.u.)
1500
2000
2500
3000
3500
Wave number (cm-1)
(d)
38
37
36
35
34
33
32
31
30
Id (μA)
-1.0
-0.5
0.0
0.5
1.0
Vg (V)
(e)
Source
Solution to be detected
Electrode
PDMS Block
Quartz
Drain
Channel
Gate
Electrode
(f)

Figure 1

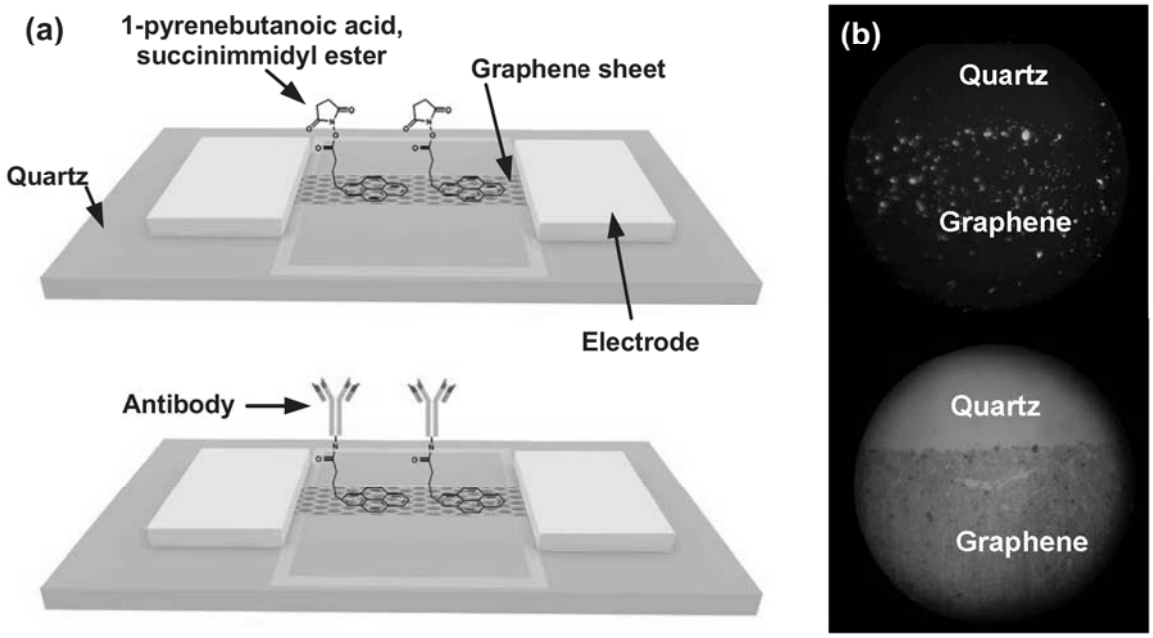


Figure 2

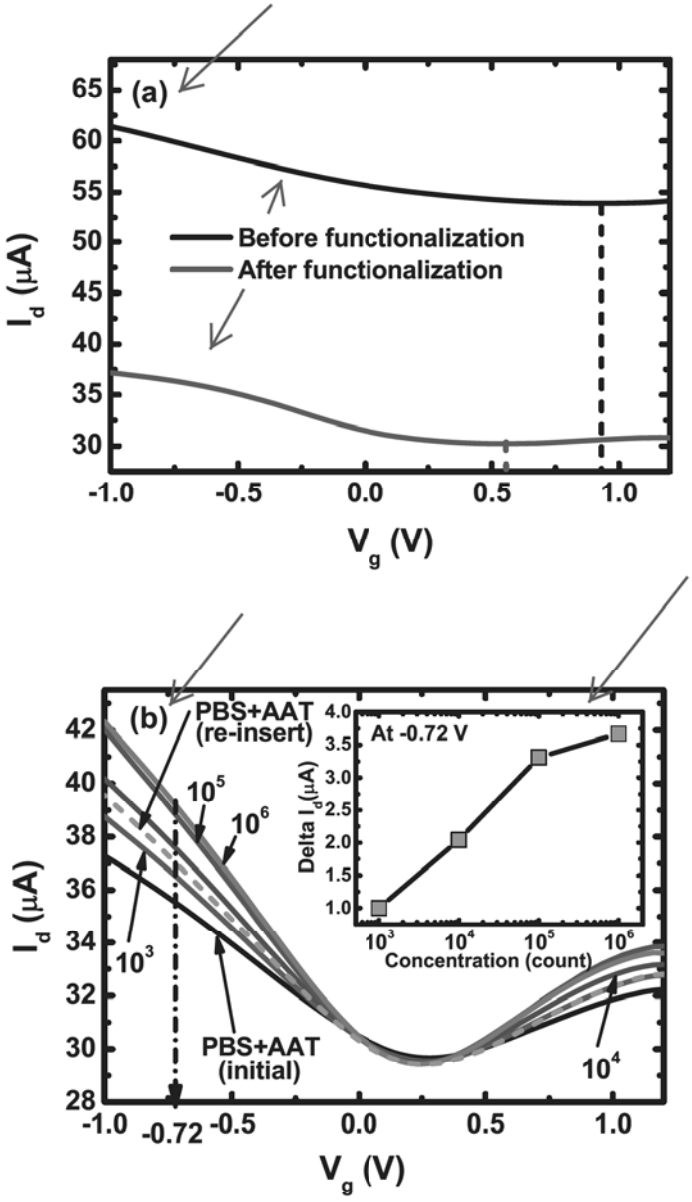

(a)
Before functionalization
After functionalization
I_d (μA)
V_g (V)
(b)
PBS+AAT
(re-insert)
10^5
10^6
10^3
PBS+AAT
(initial)
10^4
-0.72
At -0.72 V
Delta I_d(μA)
Concentration (count)

Figure 3

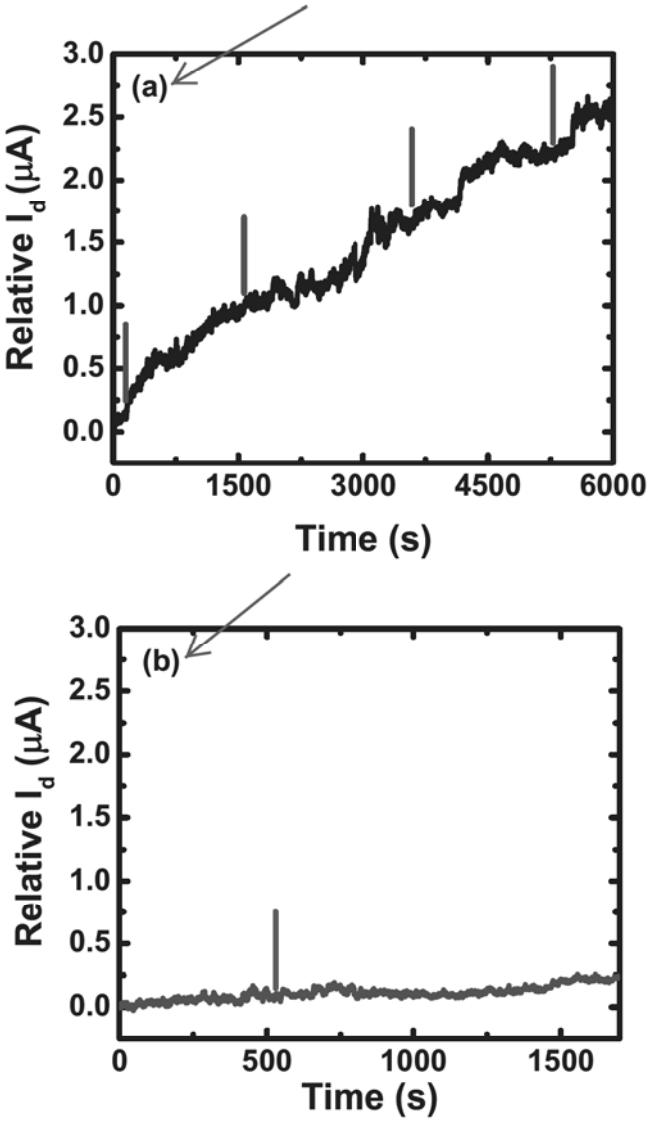

(a)
Relative I_d (μA)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
1500
3000
4500
6000
Time (s)
(b)
Relative I_d (μA)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
Time (s)

Figure 4

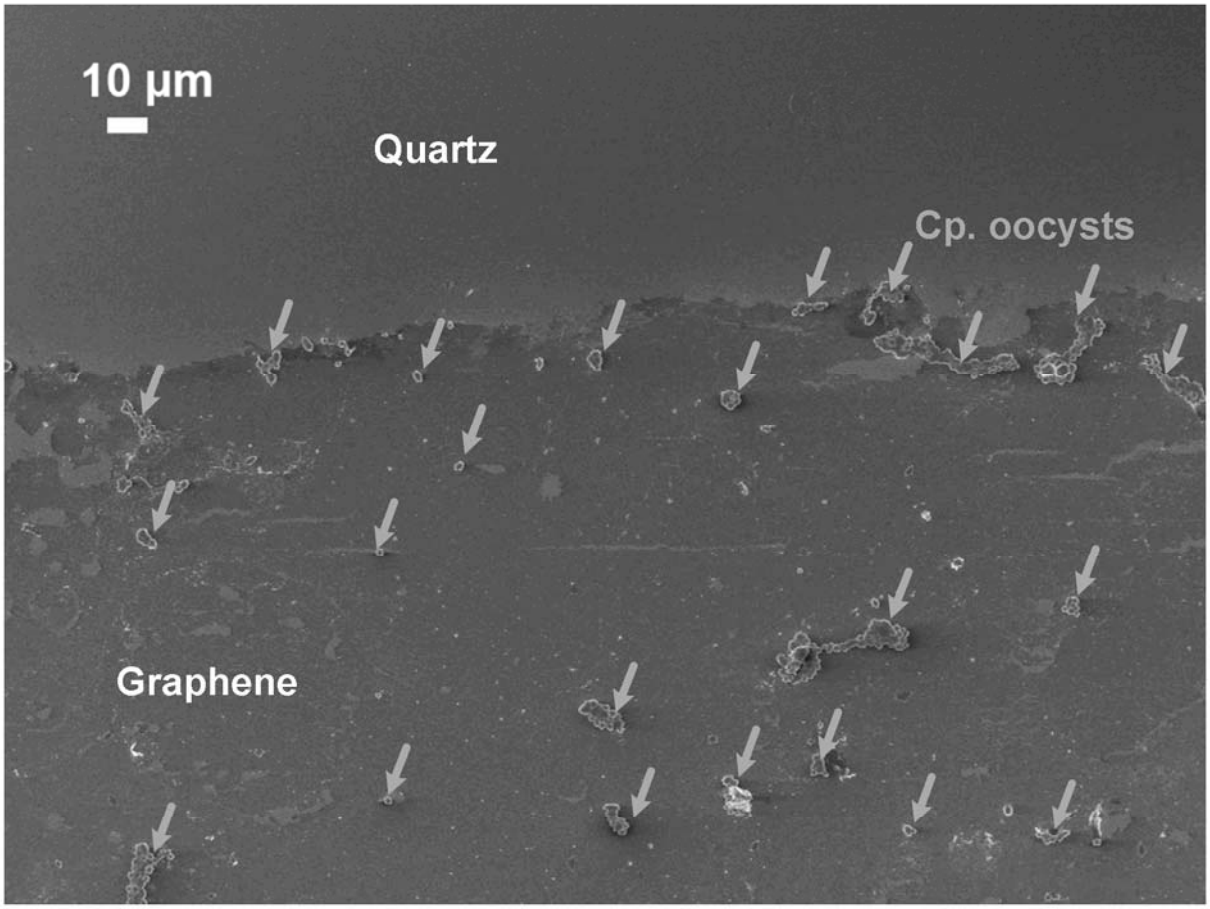


Figure 5