Graphene-based biosensor for early detection of iron deficiency

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Supplementary Information

Figure S1: The IDE shadow mask pattern design specific for 4-inch wafer used in this work.
Figure S2: GFET functionalization process.

Figure S3: Liquid-gated FET Setup.

Figure S4: Raman shift for CVD-synthesized monolayer graphene.
Table S1: Ferritin concentration and the equivalent bound fraction.

| Ferritin Antigen, $c_{F,n}$ | Bound Fraction, $B_f$ |
|------------------------------|-----------------------|
| 10 pg/mL                     | 21.1 fm               |
| 100 pg/mL                    | 210.97 fm             |
| 1 ng/mL                      | 2.11 pM               |
| 3.6 ng/mL                    | 7.59 pM               |
| 6.18 ng/mL                   | 13.04 pM              |
| 8 ng/mL                      | 16.88 pM              |

Figure S5. Shift of I-V curve upon different stages of functionalization of another device (#7). (a) Shows initial I-V curve, as well as upon functionalization with PASE + antibody, passivation, and addition of target ferritin biomolecule of 8 ng/mL concentration. (b) Shows the change in the I-V curve upon final step, of addition of specific ferritin biomolecules.