

Supporting Information

Simultaneously quantitative detection of multiple hormones based on PS-MS: affinity capture by single antibody

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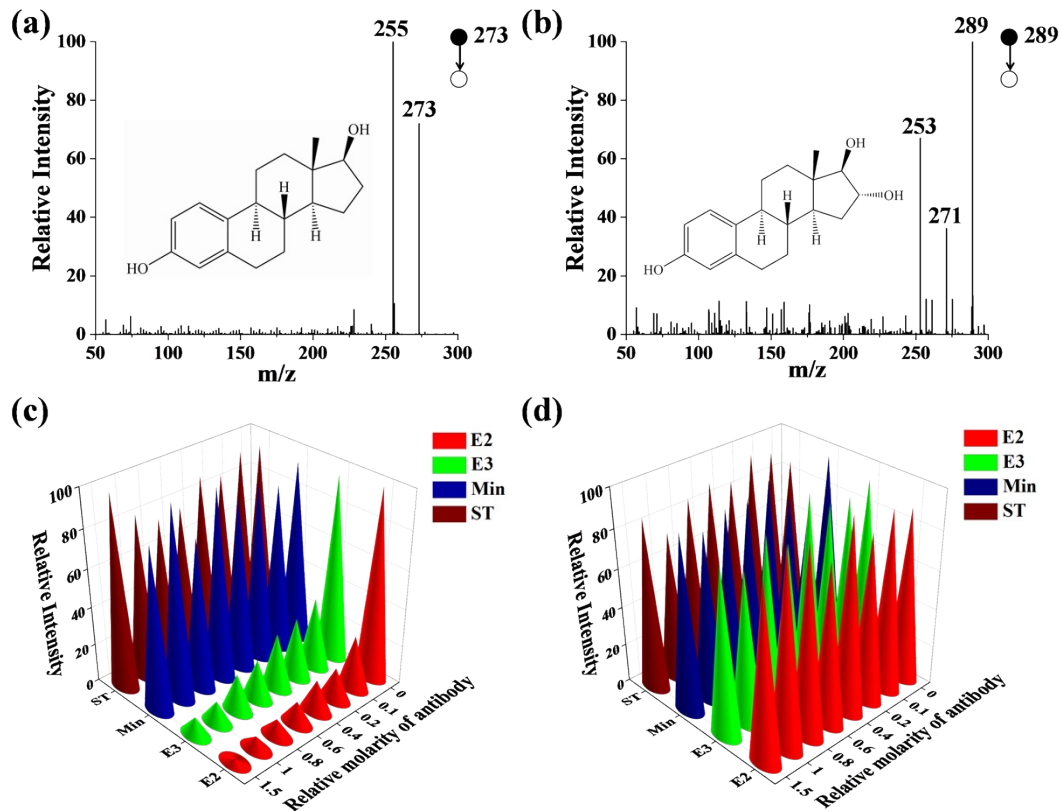


Figure S1. (a)-(b) MS/MS spectra of two hormones in standard samples: (a) estradiol (E2), (b) estriol (E3); (c)-(d) relative intensity (ratio to the highest one in different groups) of different hormones: (a) $1.0 \mu\text{g L}^{-1}$ each hormone mixed with different molar concentration of E2 antibody, (b) paralleled samples to (a) just added with 5% (v/v) formic acid.

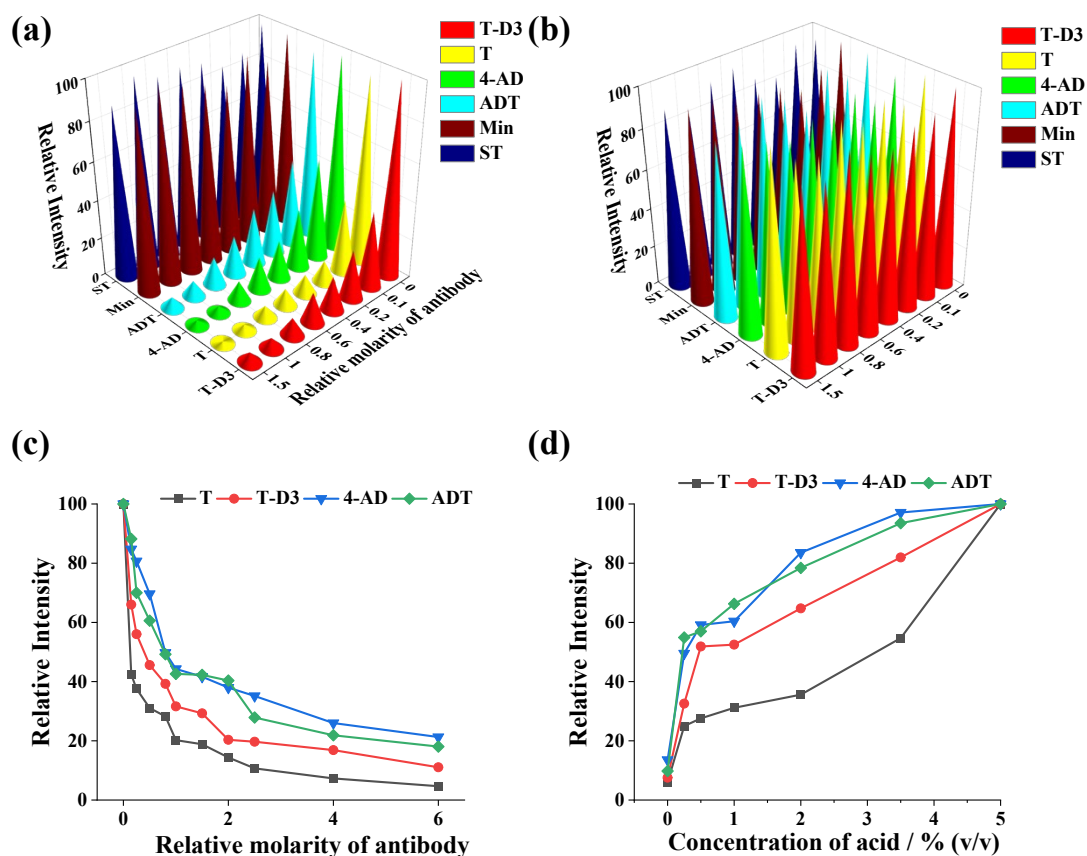


Figure S2. (a)-(b) Relative intensity (ratio to the highest one in different groups) of different hormones: (a) $1.0 \mu\text{g L}^{-1}$ each hormones respectively mixed with different molar concentration of T antibody from another company, (b) paralleled samples to (a) just added with 5% (v/v) formic acid, (c) relative intensity (ratio to the highest one in different groups) of four mixed hormones ($1.0 \mu\text{g L}^{-1}$ for each) with different molar concentration of T antibody, (d) relative intensity (ratio to the highest one in different groups) of four mixed hormones ($1.0 \mu\text{g L}^{-1}$ for each) with $2.0 \times 10^{-8} \text{ mol L}^{-1}$ T antibody

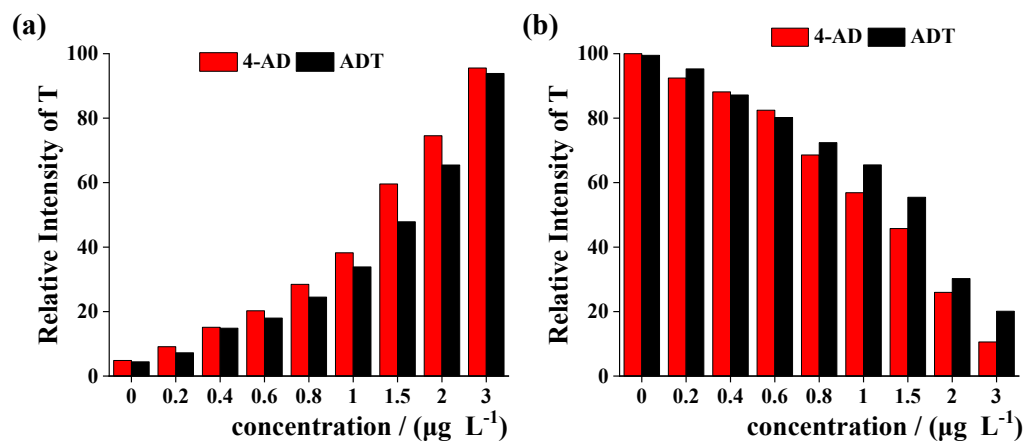


Figure S3. Relative intensity of T (a) dissociative section; (b) captured section. ($1 \mu\text{g L}^{-1}$ T, $5.0 \times 10^{-8} \text{ mol L}^{-1}$ T antibody mixed with different concentration of 4-AD or ADT respectively)

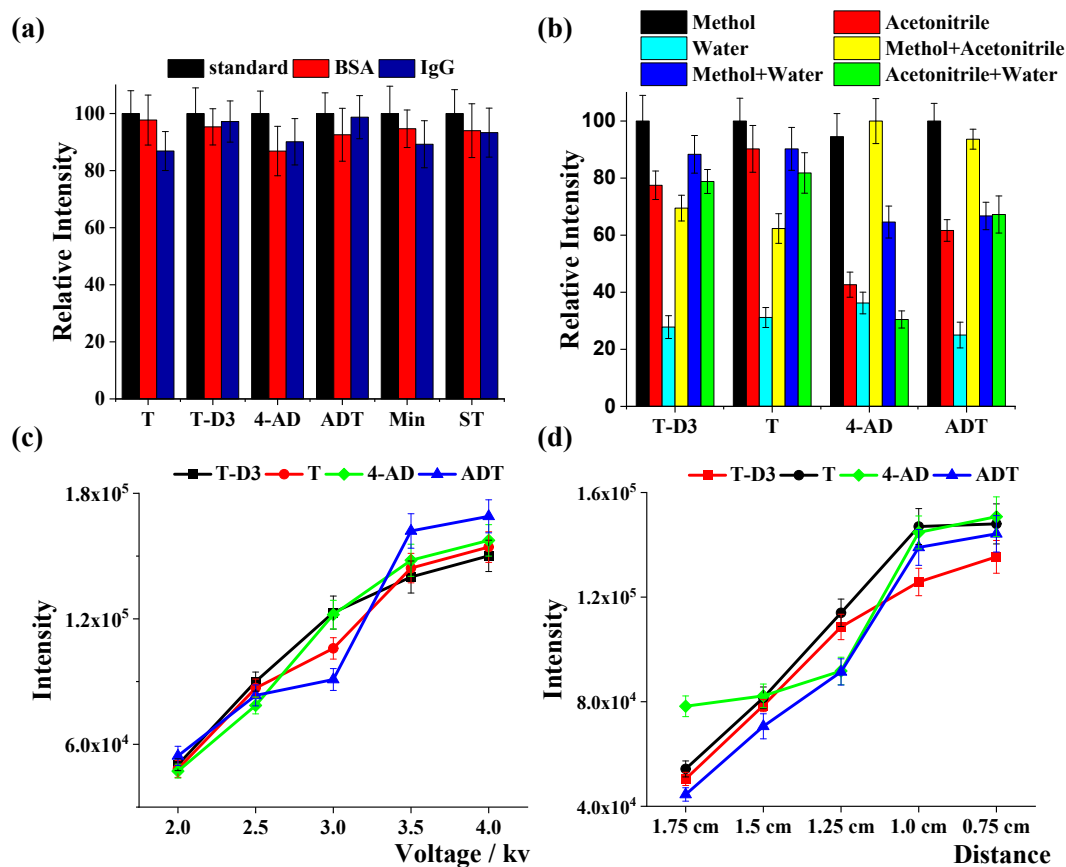


Figure S4. (a) Relative intensity (ratio to the highest one in different groups) of six hormones ($1.0 \mu\text{g L}^{-1}$ for each) respectively mixed with $2.0 \times 10^{-8} \text{ mol L}^{-1}$ BSA and IgG compared with standard samples, (b)-(d) optimization results of PS-MS (the concentration of samples was all kept to $1 \mu\text{g L}^{-1}$): (a) spray solvent, (c) ionization voltage, (d) the distance between paper and MS inlet.

Table S1. Calculated results of recovery in spiked serum to direct paper spray.

| <i>compound</i> | <i>Paper spray</i> ($\mu\text{g/L}$) | <i>Affinity process</i> ($\mu\text{g/L}$) | <i>Recovery/%</i> |
|-----------------------------------|-------------------------------------------|------------------------------------------------|-------------------|
| <i>Testosterone</i> | 0.04 ± 0.005 | 0.04 ± 0.004 | 90.9 |
| | 0.16 ± 0.007 | 0.16 ± 0.008 | 98.8 |
| | 0.61 ± 0.022 | 0.58 ± 0.033 | 95.1 |
| | 1.49 ± 0.060 | 1.54 ± 0.078 | 103.4 |
| <i>Androsterone</i> | 0.04 ± 0.004 | 0.04 ± 0.003 | 107.5 |
| | 0.16 ± 0.010 | 0.15 ± 0.010 | 93.8 |
| | 0.58 ± 0.028 | 0.61 ± 0.025 | 105.2 |
| | 1.47 ± 0.069 | 1.45 ± 0.087 | 98.6 |
| <i>Androstenedion</i> <i>e</i> | 0.04 ± 0.005 | 0.04 ± 0.004 | 95.2 |
| | 0.16 ± 0.008 | 0.15 ± 0.009 | 96.8 |
| | 0.64 ± 0.024 | 0.62 ± 0.030 | 96.9 |
| | 1.50 ± 0.071 | 1.55 ± 0.090 | 103.3 |