

**1 Gold nanoparticles- single chain fragment variable antibody as immunoprobe**  
**2 for rapid detection of morphine by dipstick**

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Supplementary Information-

Table S1. Selective enrichment of morphine scFv antibody by seven different rounds of biopanning

| <b>Selection Round</b> | <b>Antigen (µg/mL)</b> | <b>Phages Input<sup>a</sup></b> | <b>Phages Recovery<sup>a</sup></b> | <b>Phages Yield<sup>b</sup></b> |
|------------------------|------------------------|---------------------------------|------------------------------------|---------------------------------|
| 1.                     | 50                     | 1.2 x 10 <sup>12</sup>          | 6.2 x10 <sup>2</sup>               | 5.1 x10 <sup>-10</sup>          |
| 2.                     | 40                     | 8.5 x10 <sup>11</sup>           | 6 x10 <sup>5</sup>                 | 7.0 x10 <sup>-7</sup>           |
| 3.                     | 30                     | 7.5 x10 <sup>12</sup>           | 5.5 x10 <sup>6</sup>               | 7.3 x10 <sup>-7</sup>           |
| 4.                     | 20                     | 6.8 x10 <sup>11</sup>           | 4.1 x10 <sup>8</sup>               | 6.0 x10 <sup>-4</sup>           |
| 5.                     | 15                     | 2.1 x10 <sup>11</sup>           | 8.1 x10 <sup>8</sup>               | 3.8 x10 <sup>-3</sup>           |
| 6.                     | 10                     | 6.9 × 10 <sup>11</sup>          | 2.8 × 10 <sup>6</sup>              | 4.05 x 10 <sup>-6</sup>         |
| 7.                     | 5                      | 4.8 × 10 <sup>11</sup>          | 1.8 × 10 <sup>6</sup>              | 3.75 x 10 <sup>-6</sup>         |

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<sup>a</sup> Phage inputs and recoveries were determined by infections in E. coli TG1 and plated onto 2 x TY;

10      <sup>b</sup> Yield was calculated by output phage number/input phage number × 100.  
11      Antigen- Morphine-BSA