

Supplementary Information

A Rapid and Sensitive Aptamer-Based Biosensor for Beta-lactoglobulin milk

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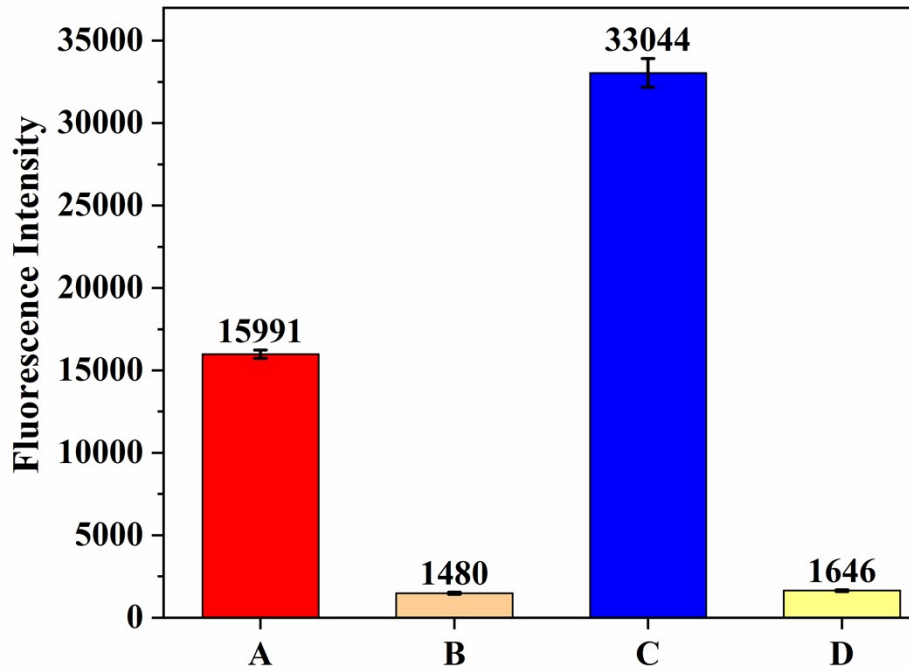


Figure S1 The luminescence values of the four experimental groups for coupling efficiency calculation.

Table S1. Sequences of the library and primers

| Name | Library and Primers (5' to 3') |
|---------------|--|
| library10 | ATTGGCACTCCACGCATAGG-(N ₃₆)-CCTATGCGTGCTACCGTGAA |
| L10-S1 | ATTGGCACTCCACGCATAGG |
| L10-A2 | TTCACGGTAGCACGCATAGG |
| L10-FAM-S1 | FAM-ATTGGCACTCCACGCATAGG |
| L10-Biotin-A2 | Biotin-TTCACGGTAGCACGCATAGG |
| L10-polyA-A2 | AAAAAAAAAAAAAAAAAAAAA-spacer18-TTCACGGTAGCACGCATAGG |

Table S2. The conditions of SELEX process

| β -Lg (lib10) | Library input concentration (pM) | HsDNA concentration (mg/ml) | BSA concentration (mg/ml) | Positive Beads(μ l) | Positive SELEX Time |
|---------------------|----------------------------------|-----------------------------|---------------------------|--------------------------|---------------------|
| 1 | 1400 | 0.05 | 0.05 | 50 | 1h |

| | | | | | |
|---|-----|------|------|----|-------|
| 2 | 100 | 0.05 | 0.05 | 50 | 1h |
| 3 | 80 | 0.1 | 0.1 | 50 | 50min |
| 4 | 80 | 0.1 | 0.1 | 50 | 50min |
| 5 | 80 | 0.1 | 0.1 | 50 | 50min |
| 6 | 80 | 0.1 | 0.1 | 50 | 50min |
| 7 | 80 | 0.1 | 0.1 | 50 | 50min |

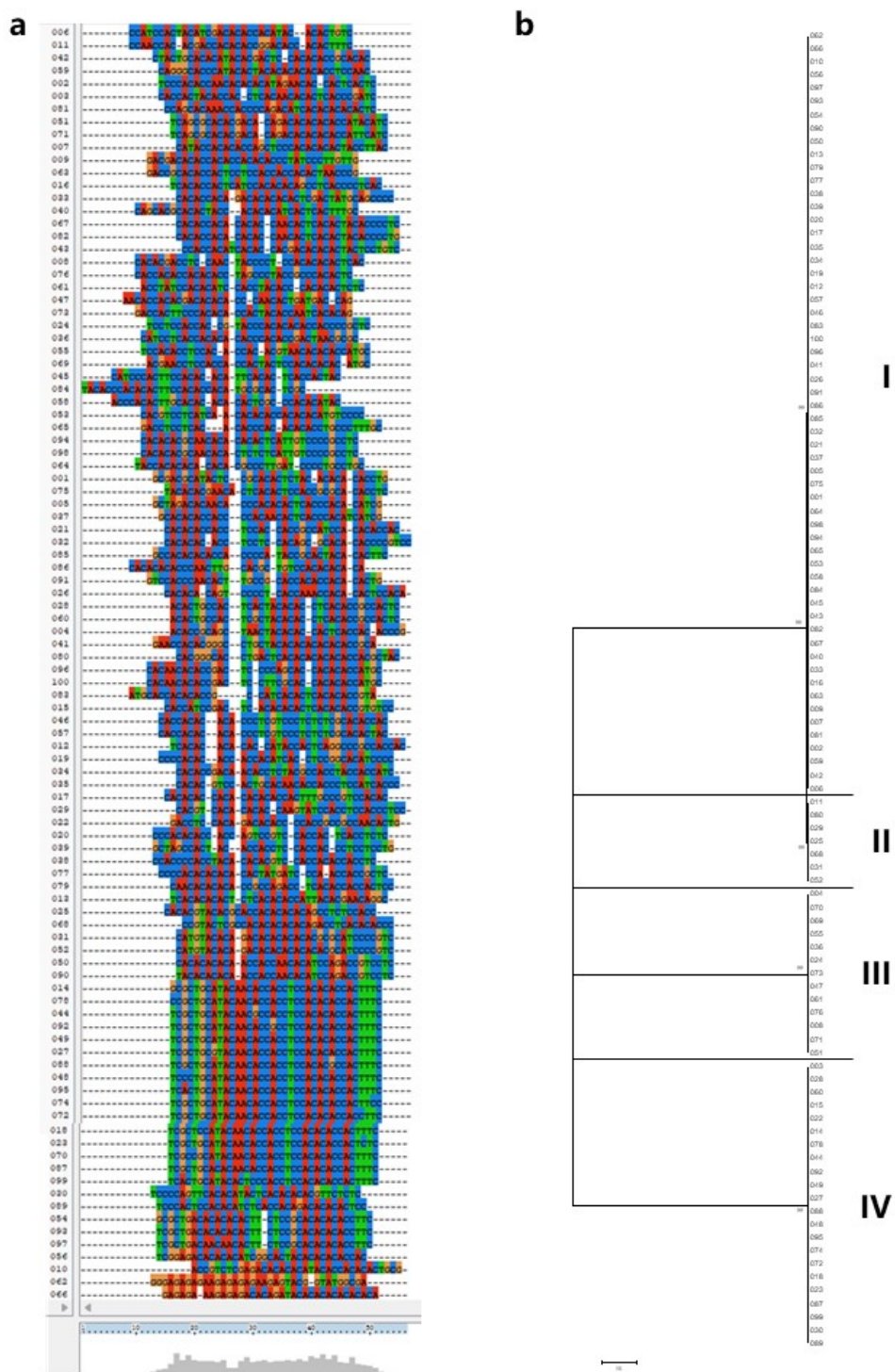


Figure S2. The group information of dominant sequences by MB-SELEX.

(a) The results of multiple sequence alignment. (b) The N-J tree of dominant sequences.

Table S3. Alternative aptamers from the MB-SELEX method

| Number | Sequence(5' to 3') | RU | K _D (M) | Family |
|---------|--|-------|--------------------|--------|
| β-Lg-01 | ATTGGCACTCCACGCATAGGGCGACGCATACTCC GCACACTCTACACACACACCTGCCTATGCGTGCTA CCGTGAA | 109.7 | 4.59E-09 | I |
| β-Lg-02 | ATTGGCACTCCACGCATAGGTCCCACACCAACAC ACACATAGAACACCACTCACTCCCTATGCGTGCTA CCGTGAA | 96.9 | 4.33E-09 | I |
| β-Lg-03 | ATTGGCACTCCACGCATAGGCACCACTACACCAC CTCACAACACACTCACCCGATCCCTATGCGTGCTA CCGTGAA | 91.8 | 3.89E-09 | IV |
| β-Lg-04 | ATTGGCACTCCACGCATAGGACACCGCAGCTAAC TACACACCACTCACACACCCGCCTATGCGTGCTA CCGTGAA | 79.3 | 5.13E-09 | III |
| β-Lg-05 | ATTGGCACTCCACGCATAGGGCTAGACACAACAC CCACACACTCACCCACACATCGCCTATGCGTGCTA CCGTGAA | 74.5 | 5.49E-09 | I |
| β-Lg-06 | ATTGGCACTCCACGCATAGGCCATCCACTACATCG ACACACCACATACACTGTCCCTATGCGTGCTAC CGTGAA | 73.5 | 5.34E-09 | I |
| β-Lg-07 | ATTGGCACTCCACGCATAGGCATAACCACACACCA GCTCCCACACACTACCTTACCCTATGCGTGCTA CCGTGAA | 67.6 | 5.76E-09 | I |
| β-Lg-08 | ATTGGCACTCCACGCATAGGCACACGACCTCAA CTACCCCTCCACACACTCACCCCTATGCGTGCTA CCGTGAA | 64.8 | 5.30E-09 | III |
| β-Lg-09 | ATTGGCACTCCACGCATAGGGACGACACACCACA CCACACACCCTATCCCTTGTTCCTATGCGTGCTA CCGTGAA | 68.4 | 4.45E-09 | I |
| β-Lg-10 | ATTGGCACTCCACGCATAGGACCGTCTCGAGACA CACACATACACCACACACTGCGCCTATGCGTGCT ACCGTGAA | 74.9 | 3.26E-09 | I |
| β-Lg-11 | ATTGGCACTCCACGCATAGGCCAACCACACGACC ACACACCCGGACACCACACTTTCCTATGCGTGCTA CCGTGAA | 59.3 | 6.21E-09 | II |
| β-Lg-12 | ATTGGCACTCCACGCATAGGTCACACACACACCA TACCACTCAGGCCCGCCACCACCCTATGCGTGCTA CCGTGAA | 62 | 5.86E-09 | I |
| β-Lg-14 | ATTGGCACTCCACGCATAGGGCGCTGCATACAAC ACCACCTCCACACACCACTTTCCTATGCGTGCTA CCGTGAA | 55.1 | 6.25E-09 | IV |
| β-Lg-15 | ATTGGCACTCCACGCATAGGCACCATCCGACTCA CACACACTCACACACCCGTGTCCCTATGCGTGCTA CCGTGAA | 52.1 | 6.50E-09 | IV |

Table S4. The response value of aptasensor to β -Lg at different time

| | Day 1 | Day 7 | Day 15 |
|----------------|---------------------|---------------------|---------------------|
| β -Lg-01 | 0.2231 \pm 0.0005 | 0.2340 \pm 0.0051 | 0.2180 \pm 0.0011 |