# Detection of Pathogenic Bacteria in Milk and Whey Samples using A Fluorescence Resonance Energy Transfer Aptasensor based on Cerium Oxide Nanoparticles

**Sena Ghayyem[1], Farnoush Faridbod[1]\***

*[1]Analytical Chemistry Department, School of Chemistry, College of Science, University of Tehran, Tehran, Iran*

**Table S1.** Factors and levels of the orthogonal test

| Level | Factors | | |
| --- | --- | --- | --- |
| | A(time(h)) | B(Azm-CeO$_2$ NPs(mg/mL)) | C(Aptamer-AuNPs(nM)) |
| 1 | 0.25 | 0.05 | 3 |
| 2 | 0.5 | 0.1 | 6 |
| 3 | 1 | 0.15 | 9 |

**Table S2.** Results of the orthogonal test (F$_0$ is the initial fluorescence intensity of CeO$_2$ nanoparticles and F is the fluorescence intensity in different situations)

| No. | Level of A | Level of B | Level of C | F | F$_0$ | ΔF |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 1 | 310 | 430 | 120 |
| 2 | 1 | 2 | 2 | 270 | 430 | 160 |
| 3 | 1 | 3 | 3 | 350 | 430 | 80 |
| 4 | 2 | 1 | 2 | 480 | 760 | 280 |
| 5 | 2 | 2 | 3 | 400 | 760 | 360 |
| 6 | 2 | 3 | 1 | 330 | 760 | 430 |
| 7 | 3 | 1 | 3 | 750 | 980 | 230 |
| 8 | 3 | 2 | 1 | 690 | 980 | 290 |
| 9 | 3 | 3 | 2 | 720 | 980 | 260 |

**Table S3.** Analysis of the results of the orthogonal test (ki is the sum of level i (i= 1, 2, 3) and Ki is the averages of level i (i= 1, 2, 3))

| No. | $\Delta F$ | | |
|---|---|---|---|
| | A | B | C |
| $k_1$ | 360 | 630 | 840 |
| $k_2$ | 1070 | 810 | 700 |
| $k_3$ | 780 | 770 | 670 |
| $K_1$ | 120 | 210 | 280 |
| $K_2$ | 356.67 | 270 | 233.33 |
| $K_3$ | 260 | 256.67 | 223.33 |
| R | 236.67 | 60 | 56.7 |
| Trend | 2>3>1 | 2>3>1 | 1>2>3 |