(1) Fluorescence measurement

1. Purpose of the experiment: to verify the effect of optically controlled amplification.

2. Experimental equipment

2.1. Reagents: control group and experimental group were cultured for 24 hours and 48 hours, LB liquid medium.

2.2. Instruments: liquid transfer guns and gun heads, alcohol lamp, 96-well-black board, fluorescent enzyme marker, etc.

3. Experimental steps

Next to the ignited alcohol lamp, the control group and the experimental group cultured for 24 hours and 48 hours were added 100μl to the 96-well-black board according to the table below, and the fluorescence value was detected by fluorescence enzyme labeling instrument (excitation wavelength: 488nm; emission wavelength 516nm).

24h	1~3	5~6
A	BL21+T7-dusk-eGFP+200μg IPTG(lucifuge)	BL21+dusk-eGFP-pUC57 1(lucifuge)
B	BL21+T7-dusk-eGFP+150μg IPTG(lucifuge)	BL21+dusk-eGFP-pUC57 2(lucifuge)
C	BL21+T7-dusk-eGFP+100μg IPTG(lucifuge)	BL21+dusk-eGFP-pUC57 1(blue light)
D	BL21+T7-dusk-eGFP+50μg IPTG(lucifuge)	BL21+dusk-eGFP-pUC57 2(blue light)
E	BL21+T7-dusk-eGFP(lucifuge)	LB liquid medium

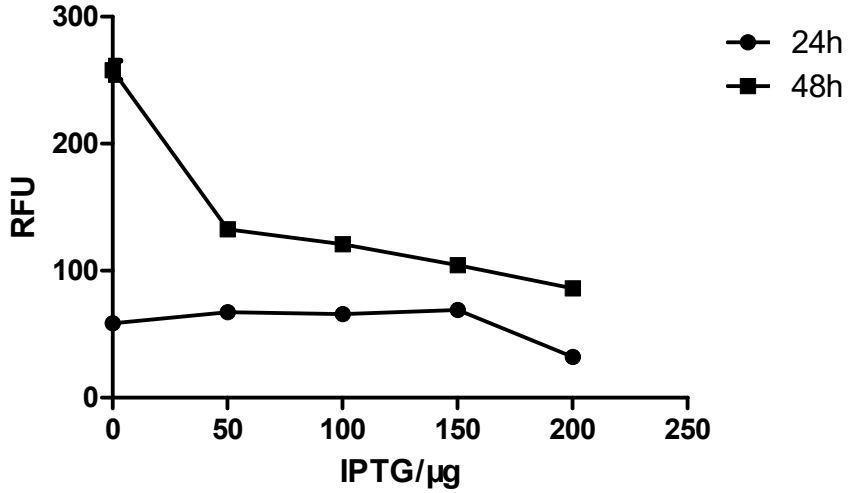
48h	1~3	5~6
A	BL21+T7-dusk-eGFP+200μg IPTG(lucifuge)	BL21+dusk-eGFP-pUC57 1(lucifuge)
B	BL21+T7-dusk-eGFP+150μg IPTG(lucifuge)	BL21+dusk-eGFP-pUC57 2(lucifuge)
C	BL21+T7-dusk-eGFP+100μg IPTG(lucifuge)	BL21+dusk-eGFP-pUC57 1(blue light)
D	BL21+T7-dusk-eGFP+50μg IPTG(lucifuge)	BL21+dusk-eGFP-pUC57 2(blue light)
E	BL21+T7-dusk-eGFP(lucifuge)	LB liquid medium

4. Determination results

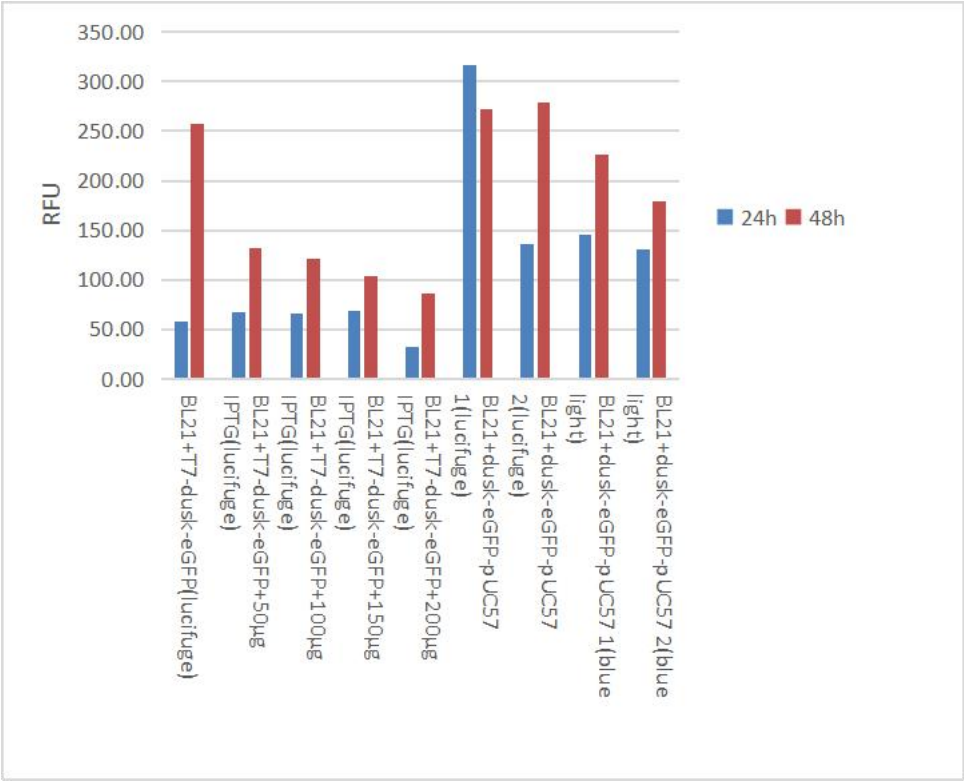
24h	1	2	3	5	6	7
A	59.715	60.658	59.963	345.695	340.374	346.202
B	92.683	98.344	99.885	165.981	158.534	168.811
C	89.275	99.273	92.804	178.043	169.867	173.512
D	94.787	94.615	96.456	168.137	157.914	150.303
E	85.432	86.694	87.746	28.713	27.898	27.058

48h	1	2	3	5	6	7

A	91. 843	93. 453	96. 236	275. 402	274. 683	289. 027
B	108. 592	116. 928	110. 625	270. 656	303. 268	285. 194
C	120. 537	132. 638	132. 239	237. 538	201. 887	261. 247
D	140. 466	139. 247	141. 566	200. 756	178. 165	181. 704
E	250. 58	273. 538	272. 825	7. 976	7. 227	7. 931



Picture 1. curve of relationship between IPTG dosage and fluorescence value in experimental group



Picture 2. optically controlled amplification effect

5. Analyse

According to the experimental results, 50mg IPTG may be the most suitable dosage in the experimental group. So we decided to test the relationship between the time of culture and the

fluorescence value of the experimental group without IPTG or added 50mg IPTG. However, the fluorescence value of the control group was significantly higher than that of the experimental group after switching to BL21 host. This is a major discovery.