

## 铜和其他重金属离子诱导大肠杆菌抗铜启动子的研究

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收稿日期 修回日期 网络版发布日期 接受日期

**摘要** 通过测定荧光酶活性研究了大肠杆菌抗铜基因上的两个铜诱导的启动子。结果表明,在缺少抗铜质粒 pBIN19pco的情况下,启动子PpcoA box-lux和PpcoA long-lux的最大诱导均出现在5mmol/LCuSO<sub>4</sub>,而且PpcoA box是一个比PpcoA long强的启动子;铜对两个PpcoE-lux构建的诱导的生物荧光曲线中,有两个峰,第一个峰出现在0.5mmol/L CuSO<sub>4</sub>时,第二个峰亦即最大诱导出现在约5mmol/L CuSO<sub>4</sub>时,并且PpcoE long的活性比PpcoE box高。结果还表明,启动子PpcoE比PpcoA活性高得多;此外,由于两个Ppco short-lux构建均不显示任何荧光酶活性,说明Copper box对于抗铜基因来说是非常重要的甚至是必需的。在质粒pBIN 19pco存在的情况下,所有启动子的最大诱导均出现6mmol / L CuSO<sub>4</sub>时,而且比无该质粒时的相应最大诱导值高得多。以其他重金属离子进行诱导实验结果表明,锌和镍可以作为诱导物且锌的效果较好,镉和银则不能诱导抗铜系统。

**关键词** [抗铜启动子](#) [Copper box](#) [诱导](#) [生物荧光](#)

分类号

## Study on the Induction of pco Promoters from Escherichia coli with Copper and Other Metal Ions.

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### Abstract

Two copper inducible promoters in the pco determinant of Escherichia coli were studied by determining the luciferase activity of report vector pUCD615. The results showed that in the absence of pBIN19pco, providing copper resistance genes in trans, the maximum induction for both PpcoA lux fusions was observed at 5mmol/L CuSO<sub>4</sub> and Ppco A box was a stronger promoter than Ppcoa long. There were two peaks in the bioluminescences of both PpcoE-lux fusions induced with increasing copper concentration, the first peak was observed at about 0.5mmol/ L CuSO<sub>4</sub>. the second peak, also the maximum induction, was observed at about 5mmol/ L CuSO<sub>4</sub>, and PpcoE promoter was a much stronger promoter than PpcoA promoter. The results also showed that the copper box was very important and essential to pco promoters, since both of the Ppco short-lux fusions failed to show any luciferase activity when they were induced with copper. In the presence of pBIN19pco, the maximum inductions of all of the Ppco-lux fragments were observed at 6mmol/ L CuSO<sub>4</sub> and they were much higher than those observed in the absence of pBIN19pco, and the results also indicated that the cells were able to resistant to much higher copper concentration in the presence of pBIN19pco than in the absence of that. Zn<sup>+2</sup> and Ni<sup>+2</sup> could be inducers for all of the fragments and Zn<sup>+2</sup> was a better inducer than Ni<sup>+2</sup>, and Cd<sup>+2</sup> and Ag<sup>+</sup> did not induce the pco system

**Key words** [pco promoters](#) [Copper box](#) [Induction](#) [Bioluminescence](#)

DOI:

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