# 禽源致病性大腸桿菌及沙門氏菌之第一型整合子檢測

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**摘要**

2013年至2015年間，自禽類細菌性病例分離得禽源致病性大腸桿菌 （avian pathogenic *Escherichia coli*; APEC）91及沙門氏菌65株，其中沙門氏菌依血清型分別為33株*Salmonella* Pullorum，6株*Salmonella* Typhimurium，3株*Salmonella* Enteritidis，1株*Salmonella* Haifa，其餘22株為*Salmonella* sp.。整合子（integron）是一種細菌產生抗藥性的機制，為可移動的DNA組成，其上攜帶的抗藥性基因片匣可能影響細菌的抗藥性。本研究以聚合酶連鎖反應檢測禽源致病性大腸桿菌及禽類沙門氏菌是否帶有第一型整合子，並定序其上帶有的抗藥性基因片匣。其中60.7% (61/91)禽源致病性大腸桿菌及36.9% (24/65)沙門氏菌株可測得第一型整合子，其大小為721 bp到1,900 bp不等。第一型整合子所攜帶的基因片匣種類主要為aminoglycosides抗藥性基因(*aadA*)；trimethoprim抗藥性基因(*dfr*) 及一種β-lactamase基因($Bla_{PSE1}$)。帶有*dfr*基因之菌株對於trimethoprim/sulfamethoxazole皆有抗藥性，帶有*aadA*基因之菌株對於streptomycin的最小抑制濃度(minimum inhibitory concentration; MIC)則有明顯上升的情形，顯示菌株的抗藥性與第一型整合子帶有的抗藥性基因卡匣有關。然而，抗藥性基因卡匣的種類僅包含部分菌株的抗藥性，顯示還有其他抗藥機制存在。

# Detection of Class I Integron in Avian Pathogenic *Escherichia coli* and Avian *Salmonella*

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## Abstract

Ninety-one isolates of avian pathogenic *Escherichia coli* (APEC) and 65 isolates of avian *Salmonella* were cultured from bacterial infection cases in poultry during 2013-2015. Based on Modified Kauffmann-White Scheme, 33 isolates of *Salmonella* Pullorum, six isolates of *Salmonella* Typhimurium, three isolates of *Salmonella* Enteritidis, one isolates of *Salmonella* Haifa, and 22 isolates of *Salmonella* sp. were included. As an important mechanism of antimicrobial resistance, integrons refer to mobile DNA elements, which may contain one to several resistant gene cassettes. In this study, class I integrons were detected by PCR and gene sequencing. The results revealed that 60.7% 61/91) of APEC and 36.9% (24/65) of avian *Salmonella* isolates carried class I integrons with various size from 721 bp to 1,900 bp. These class I integrons contained gene cassettes encoding resistance to aminoglycosides (*aadA*), trimethoprim (*dfr*) and *β*-lactamase ($Bla_{PSE1}$). All the *dfr*-positive isolates were resistant to trimethoprim/sulfamethoxazole; the *aadA*-positive isolates were increased in the minimum inhibitory concentration of streptomycin. The results indicated that types of resistant cassette assays reflected the relevant resistances in APEC and *Salmonella* isolates.