

**TITLE: DETECTION OF THE PLASMID-MEDIATED COLISTIN-RESISTANCE GENE MCR-1 ISOLATED FROM CLINICAL SAMPLES FROM THE UNICAMP HOSPITAL COMPLEX**

**AUTHORS:** OLIVEIRA, F.A.<sup>1</sup>; ZACCARIOTTO, T.R.<sup>1</sup>; PIVETA, C.S.C.<sup>1</sup>; LINCOPAN, N.<sup>2</sup>; LEVY, C.E.<sup>1</sup>

**INSTITUTIONS:** 1 - HOSPITAL DE CLINICAS DA UNIVERSIDADE ESTADUAL DE CAMPINAS (RUA VITAL BRASIL, 251 CIDADE UNIVERSITÁRIA, CAMPINAS-SP, BRAZIL)

2 – INSTITUTO DE CIÊNCIAS BIOMÉDICAS – UNIVERSIDADE DE SÃO PAULO (AVENIDA PROFESSOR LINEU PRESTES, 1374, SÃO PAULO – SP, BRAZIL)

**ABSTRACT:**

Antibiotic resistance is a worldwide problem and is now emerging at an alarming rate among a variety of bacterial species, causing both nosocomial and community-acquired infections. The rapid increase in the prevalence of multiresistant gram negative pathogens led to the consideration of polymyxins (colistin and polymyxin B) as a valid therapeutic option. In November 2015, plasmid-mediated resistance to colistin called *mcr-1* (mobile colistin resistance) was described. The study reported the presence of the gene in *Escherichia coli* and *Klebsiella pneumoniae* isolated from patients hospitalized, animal sources (pigs) and raw meat (swine and chicken), with higher rates in animal samples. Recently, ANVISA published a risk statement (nº 01/2016), alerting the emergence of bacteria carrying the *mcr-1* gene in Brazil, requesting microbiology laboratories to monitor possible isolates carrying this gene. The aim of this study was to detect the presence of the *mcr-1* gene in isolates of colistin-resistant enterobacteriaceae from August 2015 to April 2017. The isolates were previously identified by automated methodology by the BD Phoenix™ equipment, as well as the antimicrobial susceptibility test, following the standards of the European Committee on Antimicrobial Susceptibility Testing (EUCAST). Detection of the *mcr-1* gene was performed by the Polymerase Chain Reaction (PCR) technique using specific primers and confirmed by whole genome sequencing (WGS). A total of 14 Gram-negative isolates with MICs of colistin  $\geq 4$ mcg / mL were tested in this study. Five them were *Escherichia coli* and presented the *mcr-1* gene being four isolates causative agents of urinary tract infection (one of them producer of Extended Spectrum-beta-lactamases – ESBL). The other isolate causes bloodstream infection and is also a producer of ESBL. Based on this study, it is proven that the gene is present in our hospital complex, thus justifying the importance of the research of the *mcr-1* gene that, because it is present in a plasmid, becomes an extremely relevant mechanism of resistance. Gene can be easily transferred to gram-negative rods producing carbapenemases and to cause resistance to one of the last available therapeutic options, that is the colistin.

**Keywords:** *mcr-1* gene, colistin resistance, enterobacteriaceae