

## **Outbreak of *Citrobacter freundii* carrying VIM-1 in an Italian Hospital, identified during the carbapenemases screening actions, June 2012**

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### **OBJECTIVE**

The identification of patients colonized or infected with carbapenemase-producing Enterobacteriaceae (CPE), in order to control and prevent the global spread of multidrug-resistant (MDR) pathogens.

### **METHODS**

From June 1 to June 15, 2012, eight *Citrobacter freundii* strains with reduced susceptibility to carbapenems were isolated from rectal swabs of hospitalized patients during active screening following the detection of a *Klebsiella pneumoniae* carbapenemase (KPC) -positive patient on the ward. All isolates were analyzed phenotypically and molecularly by PCR and sequencing. Genotype clustering was performed by multilocus sequence typing (MLST) analysis.

### **RESULTS**

The isolates showed high rates of multidrug resistance profile. A phenotypic assay for carbapenemase production suggested the presence of metallo- $\beta$ -lactamase (MBL). The blaVIM-1 gene was detected in all imipenem-resistant *C. freundii* isolates. MLST showed that the *C. freundii* isolates shared the same sequence type (ST). Phylogenetic analysis revealed a strict relationship with an ST5C. *freundii* isolate from a diarrhea patient in China.

### **CONCLUSIONS**

Our findings showed that the active surveillance program for CPE was useful, not only for the detection of KPC-producers, but also to identify and control the spread of other MDR pathogens that could expand the spectrum of circulating MDR pathogens.