

Genetic Mechanisms and Dissemination of Antibiotic Resistance

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Abstract:

The spread of antibiotic resistance is aided by mobile elements such as transposons and conjugative plasmids. Recently, integrons have been recognised as genetic elements that have the capacity to contribute to the spread of resistance. Integrons constitute an efficient means of capturing gene cassettes and allow expression of encoded resistance. The aims of this study were to screen clinical isolates for integrons, characterise gene cassettes and extended spectrum b-lactamase (ESBL) genes. Subsequent to this, genetic linkage between ESBL genes and gentamicin resistance was investigated. In this study, 41 % of multiple antibiotic resistant bacteria and 79 % of extended-spectrum b-lactamase producing organisms were found to carry either one or two integrons, as detected by PCR. A novel gene cassette contained within an integron was identified from *Stenotrophomonas maltophilia*, encoding a protein that belongs to the small multidrug resistance (SMR) family of transporters. pLJ1, a transferable plasmid that was present in 86 % of the extended-spectrum b-lactamase producing collection, was found to harbour an integron carrying *aadB*, a gene cassette for gentamicin, kanamycin and tobramycin resistance and a *blaSHV-12* gene for third generation cephalosporin resistance. The presence of this plasmid accounts for the gentamicin resistance phenotype that is often associated with organisms displaying an extended-spectrum b-lactamase phenotype.

Biography:

xxxx joins Clemson University as an Assistant Professor in the Department of Biology. Prior attending Clemson, she was a Visiting Instructor at the University of Pittsburgh. She received her MBA from Southern Connecticut State University and her M.F.A. and Ph.D. from the University of Pittsburgh. She has developed new courses as a teaching assistant at UPitt and won the University Teaching Assistant Teaching Award in 2006. Her primary research interests are in the field of Genetics and Molecular Biology. Specifically, she is interested in student writing, pedagogies of experimental writing, and the intersections of rhetoric and aesthetics. In her free time, she practices yoga and explores the city for good vegetarian cuisine and instances of public art.