

costs by reducing unnecessary hospitalization and medication for patients with 'false-positive' initial AFB smears.

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Transparency Declaration

All authors declare no potential conflicts of interest.

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Resistance class I integron in clinical methicillin-resistant *Staphylococcus aureus* strains in southern China, 2001–2006

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Abstract

As a novel antibiotic resistance determinant, investigation of the occurrence and characteristics of class I integron was performed on nosocomial methicillin-resistant *Staphylococcus aureus* (MRSA) strains sampled during 2001–2006. Seventy-six out of 179 (42.5%) of the tested strains were found to carry class I integrons, with four unique arrays of gene cassettes detected. This is the first report of the comprehensive identification and typing of class I integrons in clinical MRSA isolates over a 6-year period, representing the first evidence for class I integrons as possible antibiotic resistance determinants in clinical MRSA strains.

Keywords: Antibiotic resistance determinant, class I integron, gram-positive bacteria, mobile genetic element, MRSA

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TABLE 1. Phenotypic and genotypic characteristics of 76 integron-bearing MRSA strains

Strain	Isolation year	Class I integron		SCC _{mec}		RAPD-PCR	Resistance profile	
		3'CS	Gene cassette	ccr	mec			
010808	2001	+	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
010912		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
011000*		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
011001*		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	BBB	AcChCaCeCiCIELOTs	
011016*		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	CBC	AcCeCIEGLOTs	
011024*		-	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTc	
011025		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	CBC	AcCeCIEGLOTs	
011045*		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
011052*		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
011055*		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	BBB	AcChCaCeCiCIELOTs	
011058*		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	BBB	AcChCaCeCiCIELOTs	
011083*		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
011098*		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	CBC	AcCeCIEGLOTs	
021138		2002	+	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs
021153			+	<i>dfrA1 2-orfF-aadA2</i>	3	A	DAA	AcCaCeCIOTcTs
021206*			+	<i>dfrA1 2-orfF-aadA2</i>	3	A	DAA	AcCaCeCIOTcTs
021207*	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	DAA	AcCaCeCIOTcTs	
021238*	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
021261*	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	BBB	AcChCaCeCiCIELOTs	
021266*	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	CBC	AcCeCIEGLOTs	
021267*	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
021268*	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	CBC	AcCeCIEGLOTs	
021296	-		<i>dfrA1 2-orfF-aadA2</i>	3	A	CBC	AcCeCIEGLOTs	
021542	2003	+	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
031788		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	BBB	AcChCaCeCiCIELOTs	
032142		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	BBB	ChCaCeCiCIELOTs	
032267		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
032371		+	<i>dfrA1 2-orfF-aadA2</i>	3	A	DAA	AcCaCeCIOTcTs	
032423		+	<i>aacA4-cmlA1</i>	3	A	AAE	AcAmChCaCeCIEGLOTc	
032439		+	<i>dfrA1 7-aadA5</i>	3	A	AAF	AcAmChCaCeCiCIEGLOTs	
032449		+	<i>aacA4-cmlA1</i>	3	A	AAE	AcAmChCaCeCIEGLOTc	
042470		2004	+	<i>aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs
042497			+	<i>aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs
042547	+		<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
042564	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
042637	+		<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
042649	+		<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
042772	+		<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
042848	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
042885	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
042887	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	AAA	AcAmChCaCeCiCIEGLOTcTs	
042898	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
042923	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
042954	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
042966	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
043000	+		<i>dfrA1 2-orfF-aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
053001	2005		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs
053059		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTc	
053147		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
053182		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
053224		+	<i>aadA2</i>	NT	NT	GEJ	AmChCaCeCiCIGLTcTs	
053332		-	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTc	
053333		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
053401		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
053423		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
053443		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTc	
053444		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
053474		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
053564		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
053610		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
053658		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
053685		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
053845	+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTc		
053899	+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs		
064043	2006	+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
064050		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
064064		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
064100		+	<i>aadA2</i>	3	A	FEI	AcAmCaCeCiCIEGLOTcTs	
064163		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTc	
064221		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
064249		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
064278		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
064375		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
065212		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	
065217		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTc	
065260		+	<i>aadA2</i>	3	A	GEJ	AcAmChCaCeCiCIGLOTcTs	

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