

# Low CEM-102 (Fusidic Acid [FA]) Resistance (R) Rates and High Prevalence of Acquired (acq) Genes Among *Staphylococcus* spp. (SSP) from North America and Australia.

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## Background:

Target mutations have been considered the primary SSP FA-R mechanism; however, acqFA genes have been recently shown to have a role on FA-R. We evaluated FA-R mechanisms in SSP collected from the USA, Canada and Australia (2007-2008).

## Methods:

4,167 SA and 790 coagulase-negative SSP (CoNS not *S. saprophyticus*) were consecutively collected from North American and Australian hospitals. Isolates displaying a FA MIC at  $\geq 2$   $\mu\text{g/ml}$  were tested by multiplex PCR for *fusB*, *fusC* and *fusD* (acqFA). *fusA* was sequenced for all acqFA-negative *S. aureus* (SA).

## Results:

SA FA-R rates were very low in the USA (0.3%) being higher in Canada and Australia (6.0 and 7.0%, respectively). CoNS FA-R was considerably elevated (7.2-20.0%; highest in Canada). All 52 (40 CoNS) USA isolates showed low level of FA-R (MIC,  $\leq 64$   $\mu\text{g/ml}$ ). 7 of 11 USA SA carried *fusC* and CoNS carried *fusB* or *fusC*. Many FA-R strains were from New York (18/52). 3 (27.3%) isolates did not carry acqFA genes and *fusA* mutations were also not present. In Canada, *fusB* and *fusC* were similarly found among SA and CoNS and low level of FA-R was observed. *fusA* mutations were not detected in one Canadian SA with a FA MIC at 256  $\mu\text{g/ml}$ . SSP isolates from Australia showed low R levels (MIC at  $\geq 32$   $\mu\text{g/ml}$ ) and SA were predominantly *fusC*-positive. One Australian SA (MIC, 2  $\mu\text{g/ml}$ ) was positive for *fusD*.

## Conclusions:

Low levels of FA-R were observed in these three countries, two with distinct patterns of FA usage. Moreover, acqFA genes were most prevalent among FA-R strains (>70%) with no *fusA* mutations observed. CEM-102 could be a valuable treatment for SSP infections.

Locations (% of FA-R SA/ CoNS)	Isolates at MIC ( $\mu\text{g/ml}$ )			% of (SA/CoNS)		
	$\leq 8$	16	$\geq 32$	<i>fusB</i>	<i>fusC</i>	acqFA negative
Australia (7.0/10.8)	7/4	-/2	-/5	-/54.5	85.7/45.5	-/-
Canada (6.0/20.0)	5/2	-/3	1/5	50.0/70.0	33.3/30.0	16.6/-
USA (0.3/7.2)	9/4	2/26	-/11	9.1/70.7	63.6/24.4	27.3/-