Anti-microbial sensitivity profiles of WHO identified Priority pathogens against fluoroquinolones, ceftazidime, meropenem and a novel anti-bacterial drug candidate

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MICROCON Bengaluru 2018
30-11-2018,
E-Poster 61, Hall A1

Introduction

Antimicrobial resistance has now emerged as a major threat worldwide impeding efficacious treatment of hospital associated as well as community acquired infections. No new drug has been developed in the last five decades to address the problem of AMR, especially due to Gram-negative infections. To address this key lacunae in the armamentarium to combat AMR, we have identified a novel drug candidate that is potent, bactericidal and have broad-spectrum anti-bacterial potency. An ideal assessment of their potency would be to test them against recent clinical isolates isolated from patients suffering from various bacterial infections. Towards this aim, we initiated testing against clinical pathogens from Narayana Health that were isolated from patients with various blood stream infections.

Methodology

The identity of isolates was confirmed using MALDI-TOF MS as per standard protocols at Narayana Health. The antibiotic susceptibility profiles were confirmed using Phoenix/VITEK prior to the initiation of MIC studies against key pathogens, using the microtitre based broth dilution method. MIC90 against each of the pathogen was calculated.

Data Highlights

The results demonstrated two key findings:

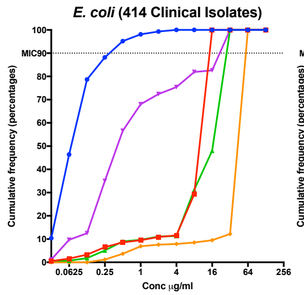
(a) potent activity of the novel drug candidate on drug sensitive and drug resistant Gram-negative pathogens such as *Acinetobacter baumannii*, Pseudomonas aeruginosa, *Escherichia coli, Klebsiella pneumoniae, Enterobacter cloacae, Serratia marcesens, Morganella morganii, Providencia* spp., *Proteus* spp., *Salmonella typhi* and non-typhoidal *Salmonella* spp.

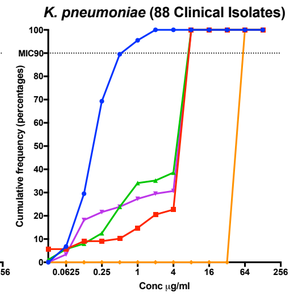
(b) the extent of drug resistance is high among the recent Gram-negative clinical isolates against fluoroquinolones, 3rd gen cephalosporins, and carbapenems.

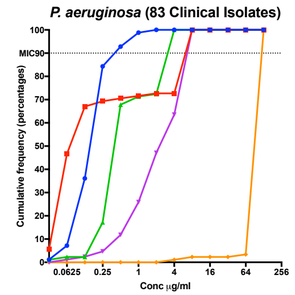
Acknowledgements

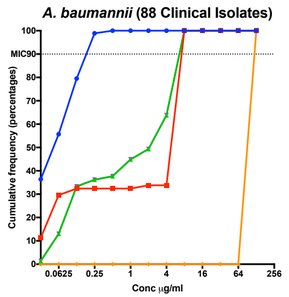
This study is supported by BIRAC, DBT, Govt. of India (BT/BIPP/0803/30/14, C-CAMP/BIG/98B) and CARB-X (6 IDSEP160030-01-02). The authors thank Dr. Devi Shetty and Dr. Vasan Sambandamurthy for their strategic advice and support.

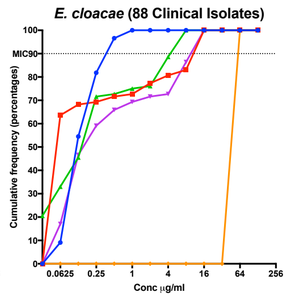
Results

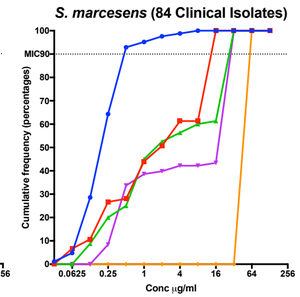


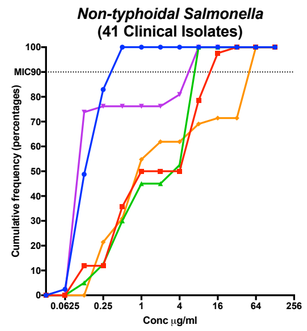


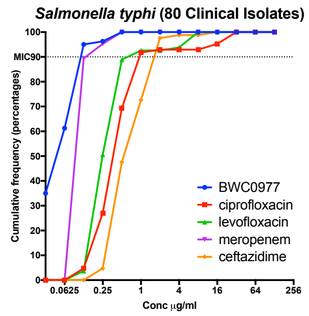


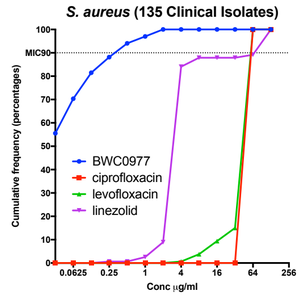


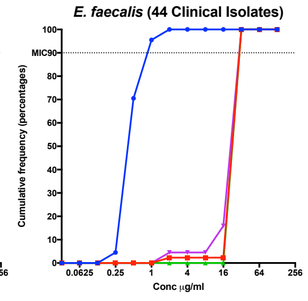


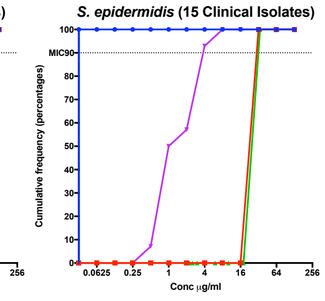












			MIC90 (mg/L)				
	Organism	N	BWC-0977	Cipro-floxacin	Levo-floxacin	Mero-penem	Ceftazidime
Gram Negative	*E. coli*	414	**0.25**	>8	>8	>8	>8
	K. pneumoniae	88	**1**	>8	>8	>8	>8
	P. aeruginosa	83	**0.5**	>8	>8	8	>8
	A. baumannii	88	**0.25**	>8	>8	>8	>8
	E. cloacae	88	**0.5**	>8	>8	>8	>8
	S. marcesens	84	**0.5**	>8	>8	>8	>8
	S. typhi	80	**0.125**	1	0.5	0.125	2
	NT-Salmonella	41	**0.5**	>8	8	8	>8
	Tribe Proteae	18	**0.5**	>8	>8	8	>8
Gram Positive	Organism	N	BWC-0977	Cipro-floxacin	Levo-floxacin	Linezolid	
	S. aureus	135	**0.25**	>8	>8	8	
	S. epidermidis	15	**0.03**	>8	>8	4	
	E. faecalis	44	**1**	>8	>8	>8	
		1178					

Conclusion

The current investigation gives an overview of the AMR scenario and the potency of a novel drug candidate effective against the multi-drug resistant pathogens. These encouraging results clearly open up the opportunity of delivering a novel antibacterial drug for the treatment of Gram negative infecitons after five decades.

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