

In vitro interaction of pentadecapeptide BPC 157 with standard antibiotics against ATCC strains

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Background

The aim of this research is to examine an *in vitro* antibacterial activity of pentadecapeptide BPC 157 (BPC 157) on American type culture collection (ATCC) bacterial strains and synergistic action of BPC 157 with standard antibiotics as well.

Materials and Methods

In this study was used pentadecapeptide BPC 157, manufactured by Diagen d.o.o., Ljubljana, Slovenia-99 % purity which is dissolved in saline solution and prepared in different concentrations.

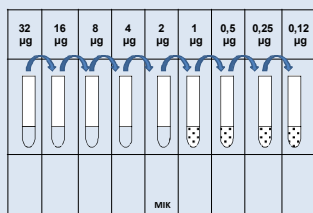


The minimum inhibitory concentration (MIC) according to the Clinical Laboratorz Institute Standards (CLSI) recommendations was determined for all bacterial strain studied: *Staphylococcus aureus* 25923, *Enterococcus faecalis* 29212, *Pseudomonas aeruginosa* 27853, *Escherichia coli* 25922, *Acinetobacter baumannii* 19606 and *Klebsiella pneumoniae* 700803.

Beta-lactam, glycopeptide, aminoglycoside, macrolide and quinolone antibiotics were used: for Gram positive strains ampicilin, erythromycin, gentamicin, vancomycin were used while amikacin, ceftazidime, ciprofloxacin and imipenem were tested for Gram negative strains.

The interactions of BPC 157 and selected antibiotics were tested by the broth microdilution method. Briefly, the MIC for the selected antibiotics alone and with the addition of fixed concentrations of 512 µg/ml BPC 157 were determined. Statistical analysis was done by Friedman and Wilcoxon test.

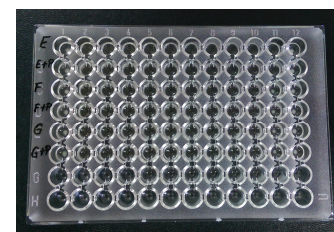
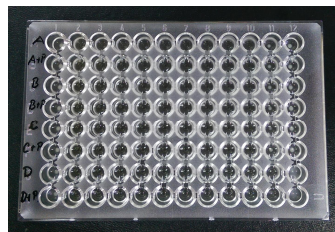
1. The antibacterial activity of BPC157 was tested by microdilution



2. The antibacterial activity of BPC157+conventional antibiotics was tested by microdilution methods

Results

There is no antibacterial activity of BPC 157 detected and the MIC were above 256 µg/ml for all ATCC strains tested. Sensitivity of ATCC strains on BPC 157 observed by microdilution method and determination of the synergistic/antagonistic activity of BPC 157 with standard antibiotics revealed no statistically significant difference ($p > 0.950$).



A,B,C,D,E,F,G= ATCC strains+convencional antibiotik
 A,B,C,D,E,F,G+P= ATCC strains +convencional antibiotik + pentadecapeptide BPC157

Atb	S. aureus		E. faecalis	
	25923	29212		
Ampicilin	1	2		
Ampicilin + BPC	1	2		
Gentamicin	0.125	8		
Gentamicin + BPC	0.125	8		
Vankomicin	1	2		
Vankomicin + BPC	1	2		
Eritromicin	0.5	4		
Eritromicin + BPC	0.5	4		

$p > 0.950$

Atb	Pseudomonas		E. coli		Acinetobacter		Kl. pneumoniae	
	27853	25922	19606	700803				
Ceftazidim	4	0.5	64	128				
Ceftazidim + BPC	4	0.5	64	128				
Ciprofoksacin	0.5	0.004	0.06	0.06				
Ciprofoksacin + BPC	0.5	0.004	0.06	0.06				
Imipenem	4	0.25	0.5	1				
Imipenem + BPC	4	0.25	0.5	1				
Amikacin	4	1	2	1				
Amikacin + BPC	4	1	2	1				

$p > 0.950$

Friedman and Wilcoxon test

Conclusion

According to results from our study we can conclude that BPC 157 doesn't have direct antibacterial activity *in vitro*. Synergistic or antagonistic effects between BPC 157 and selected antibiotics tested by microdilution method were not detected for all tested concentrations of BPC 157 and for all bacterial ATCC strains used.

References

1. Predrag Sikiric, Sven Seiwerth, Rudolf Rucman, Branko Turkovic, Dinko Stancic Rokotov, Luka Brcic, Marko Sever, Robert Klicek, Bozo Radic, Domagoj Drmic, Spomenko Ilic, Danijela Kolenc, Gorana Aralica, Mirjana Stupnisek, Jelena Suran, Ivan Barisic, Senka Dzidic, Hrvoje Vrcic and Bozidar Sebecic, Stable Gastric Pentadecapeptide BPC 157-NO-system Relation, Current Pharmaceutical Design, 2014, 20, 1126-1135
2. B. Bedenić, Antibakterijski lijekovi// Medicinska mikrobiologija / Uzunović-Kamberović, Selma (ur.). Zenica : Štamparija Fojnica d.o.o, 2009. Str. 221-252.