EuroSciCon

International Conference on
Nutritional Biochemistry

September 10-11, 2018
Prague, Czech Republic

Iryna Sorokulova et al., J Food Nutr Popul Health 2018 Volume: 2
DOI: 10.21767/2577-0586-C3-009

BACILLUS PROBIOTICS AS ANTIMICROBIALS

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Antibiotic resistance in pathogens was identified as a serious health threat, which is associated with increased morbidity and mortality worldwide. The total economic cost of antibiotic resistance to the US and EU healthcare systems was calculated as $20-35 and EUR 1.5 billion a year correspondingly. The emergence of multiresistant pathogens requires the development of new approaches to their control. Probiotic prophylaxes and therapies are gaining wider acceptance as more scientific data emerge regarding the interaction between pathogen and beneficial microbes in the human intestinal tract and molecular mechanisms of probiotics' action. Probiotic bacteria which confer beneficial effect for the host and have pronounced antagonistic activity against pathogens is expected to present a clear alternative for control of drug-resistant infections. Bacteria of the *Bacillus* genus are known as potent producers of a wide variety of antimicrobial compounds. These bacteria are also reputed to promote health benefits on the host. We believe that *Bacillus* bacteria with high activity against pathogens can be a valuable alternative strategy to control multi-resistant infections. Our study has shown high activity of B. subtilis probiotic strain against a broad spectrum of pathogens, including multiresistant *S. aureus, Salmonella, Candida*. We also found an inhibitory effect of this strain on influenza virus *in vitro* and *in vivo* studies. New peptide P18, produced by B. subtilis strain was isolated and characterized. Peptide P18 was not toxic and completely inhibited influenza virus at concentration 12.5 µg/mL. In animal studies the antiviral effect of P18 was comparable with Tamiflu. In conclusion, our results showed that *Bacillus* probiotic can be used as a valuable new approach for treatment of bacterial and viral infections.

Biography

Iryna Sorokulova is a Professor of Microbiology, Department of Anatomy, Physiology and Pharmacology, College of Veterinary Medicine, Auburn University, Auburn, AL, USA. She received her MS degree in Microbiology from Taras Shevchenko Kiev State University (Ukraine), PhD and DSc degrees in Microbiology from Institute of Microbiology and Virology, National Academy of Sciences of Ukraine. She is the author of 93 refereed scientific publications, 4 books and 23 patents (1- US, 1-France; 6-Ukraine, 15-Russia): six patents are now licensed and commercialized. She created several biotechnological products; some of them are commercially available.

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