

## 2<sup>nd</sup> International Congress on Bacteriology & Infectious Diseases

November 17-19, 2014 DoubleTree by Hilton Hotel Chicago-North Shore, USA

## Multidrug efflux pumps in Gram-negative bacteria: The assembly and drug efflux across two membranes

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Multidrug resistant bacteria threaten to reverse modern medical advances could potentially create a public health calamity. New therapeutics are urgently needed to address this growing threat. The problem is particularly acute with Gramnegative bacteria. Permeation of antibiotics through the outer membrane of Gram negative bacteria is controlled primarily by porins that restrict passage of large and hydrophobic molecules. In addition, efflux pumps actively excrete hydrophobic molecules that manage to penetrate, and the joint action of the two systems protects the bacteria from most antibiotics and lead compounds. Our research is focused on understanding of the mechanisms of multidrug efflux in bacteria and synergistic relationship between active efflux and slow uptake of antibiotics. The experimental approach is based on comparative studies of drug efflux complexes that differ in structures, energy requirements and transport mechanisms, yet able to pump various antibiotics across two-membrane cell envelopes. Using this approach we reconstructed a sequence of events leading to assembly and activation of efflux pumps in Gram-negative bacteria.

## Biography

Helen I Zgurskaya is a Professor of Chemistry and Biochemistry at the University of Oklahoma at Norman, Oklahoma. She received her PhD from Russian Academy of Sciences and held research appointments at Max Planck Institute of Molecular Genetics (Berlin, Germany), Stanford University Medical School and University of California at Berkeley, CA. She is a standing member of the Drug Development and Resistance Study Section (NIAID/NIH). She has published more than 50 papers in reputed journals and is serving as an Associate Editor of *Frontiers in Microbiology* and an editorial board member of Antimicrobial Agents and Chemotherapy journals.

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