

1. Record Nr.	UNINA9910688232803321
Autore	Hiroshi Nikaido
Titolo	Bad Bugs in the XXIst Century: Resistance Mediated by Multi-Drug Efflux Pumps in Gram-Negative Bacteria
Pubbl/distr/stampa	Frontiers Media SA, 2016
Descrizione fisica	1 online resource (193 p.)
Collana	Frontiers Research Topics
Soggetti	Microbiology (non-medical)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	<p>The discovery of antibiotics represented a key milestone in the history of medicine. However, with the rise of these life-saving drugs came the awareness that bacteria deploy defence mechanisms to resist these antibiotics, and they are good at it. Today, we appear at a crossroads between discovery of new potent drugs and omni-resistant superbugs. Moreover, the misuse of antibiotics in different industries has increased the rate of resistance development by providing permanent selective pressure and, subsequently, enrichment of multidrug resistant pathogens. As a result, antimicrobial resistance has now become an urgent threat to public health worldwide (<a href="http://www.who.int/drugresistance/documents/surveillancereport/en/">http://www.who.int/drugresistance/documents/surveillancereport/en/</a>). The development of multidrug resistance (MDR) in an increasing number of pathogens, including <i>Pseudomonas</i>, <i>Acinetobacter</i>, <i>Klebsiella</i>, <i>Salmonella</i>, <i>Burkholderia</i>, and other Gram-negative bacteria is a most severe issue. Membrane efflux pump complexes of the Resistance-Nodulation-cell Division (RND) superfamily play a key role in the development of MDR in these bacteria. RND pumps, together with other transporters, contribute to intrinsic and acquired resistance to most, if not all, of the antimicrobial compounds available in our drug arsenal. Given the enormous drug polyspecificity of MDR efflux pumps, studies on their mechanism of action are extremely challenging, and this has negatively impacted both the development of new antibiotics that are able to evade these efflux pumps as well as the design of pump</p>

inhibitors. The collection of articles in this eBook, published as a Research Topic in Frontiers in Microbiology, section of Antimicrobials, Resistance, and Chemotherapy, aims to update the reader about the latest advances on the structure and function of RND efflux transporters, their roles in the overall multidrug resistance phenotype of Gram-negative pathogens, and on strategies to inhibit their activities. A deeper understanding of the mechanisms by which RND efflux pumps, alone or synergistically with other efflux pumps, are able to limit the concentration of antimicrobial compounds inside the bacterial cell, may pave the way for new, more directed, inhibitor and antibiotic design to ultimately overcome antimicrobial resistance by Gram-negatives.

---