

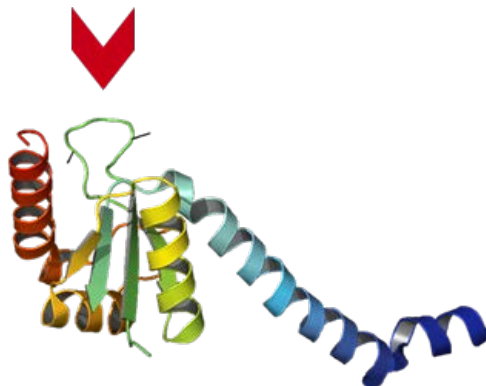
Disarming Antibiotic-Resistant Bacteria

The Problem

Drug resistant bacteria are increasing because of over dependence on antibiotics.

The Solution

The Type III Secretion System is widely employed by bacteria to inject toxins into the cytosol of host cells. Without the secretion system, many pathogenic bacteria are unable to cause disease. To block the secretion, this technology targets a loop of a protein component of the system. In contrast to antibiotics, this approach targets the bacterial virulence factor without directly killing bacteria, avoiding the strong selective pressures of antibiotics, and thus, strongly reducing bacterial drug resistance formation.



The red arrow indicates the targeted loop of a protein component of the Type III Secretion System which is widely employed by bacteria to inject toxins into the cytosol of host cells.

Applications

- Antibacterial drug discovery: antivirulence therapy for many Gram-negative bacteria including, *Bordetella bronchiseptica* (whooping cough), *Yersinia* (plague), *Salmonella* (food poisoning and typhoid fever), *Shigella* (dysentery), *Enteropathogenic E. coli* (diarrhea), *Enterohemorrhagic E. coli* (bloody diarrhea), and *Chlamydia* (respiratory, ocular disease)
- Prophylactic applications
 - Prevention of enteric disease outbreaks following flooding
 - Disease prevention in aquaculture and farming of animals and plants

Benefits

- Potential cure for patients suffering from multidrug-resistant and pan-resistant bacterial infections
- Retard the evolution and reduce the spread of drug resistant genes such as those found in hospital-acquired infections
- Maintain the normal flora of the gut and reduce the risk of *colitis* caused by *microbiota dysbiosis*
- Applicable to many pathogenic bacterial species because the targeted protein is a highly conserved component of the secretion system

Stage of development

Screening low-molecular weight compounds which bind to the target loop

Opportunity

- Licensing
- Collaborative research

Patent protection

This technology has entered the National Phase: JP2015-542885, US 14/770,708, and US15/237,244.

For more information

Technology Licensing Section at bdtl@oist.jp or +81-(0)98-966-8937