‘Tackling Superbugs’

Dr. Saroj Velamakannya
AMR is a global epidemic
Superbug related mortality: 2050

Discovery of Penicillin

Penicillin - Discovery of Sir Alexander Fleming
Wonder drug during world war
Sources of antibiotics

- Soil microbes like *Penicillium* (fungus), *Actinomycetes* (bacteria)
Selective toxicity

*magic bullet*

kills bacteria without killing us!
- Not effective against viruses
- Bacterial specific

Antibiotic specificity

Will the antibiotics be able to defeat the virus?

No!
MDR

Emergence of ‘superbugs’

*Clostridium difficile* and MRSA

Systems responsible for MDR phenomenon - multidrug transporters
Grapes of wrath
It was on a short-cut through the hospital kitchens that Albert was first approached by a member of the Antibiotic Resistance.
Spread of resistance amongst bacteria

Transposons or mobile genes
Antibiotic inactivation mechanisms
Novel strategies required to tackle superbugs

- Discovery of new ABX is slow
- Excessive use of ABX; more superbugs
- Complicated drug discovery, regulatory challenges and low ROIs; no incentive for industry
Harnessing the power of nature

- Harnessing nature’s antibiotic factories
- Novel antibiotics generated by mixing genes from different *Streptomyces*
Faecal transplantation

- Trans-poo-sion, reputation as medicine’s disgusting procedure!
- Cures nasty *C. difficile* infections
- High cure rates as high as 90%, gut microbiome is the key
- Benefits of probiotics
Reversible MDR pump
Phage therapy?

- Natures Ninjas against Superbugs
Phage therapy?

- Successful clinical trials against cystic fibrosis infections
- Phage therapy has been obsolete now gaining a lot of significance!
- Personalised medicine/Precision medicine
Big data for small bugs

Reduce AMR burden while personalizing and optimising patient treatment through real time integration and analysis of pathogen, patient, population and ABX data
Knowledge Management

Multiple questions

Multiple stakeholders; patients, nurse, doctors, accountants etc.

Lots of data and information
BioXM™ platform

This platform makes complexity manageable

BioXM-Apps deliver the right **information** in the right **context** for the right **decision**

BioXM engine ties all the data together
https://youtu.be/xZbcwi7SfZE
Thank you!

Questions?