



Institute
and Faculty
of Actuaries

Current developments and research in creating new antibiotics

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Medical Intelligence (UK) Ltd

Summary

Antibiotic discovery

Antibiotic action

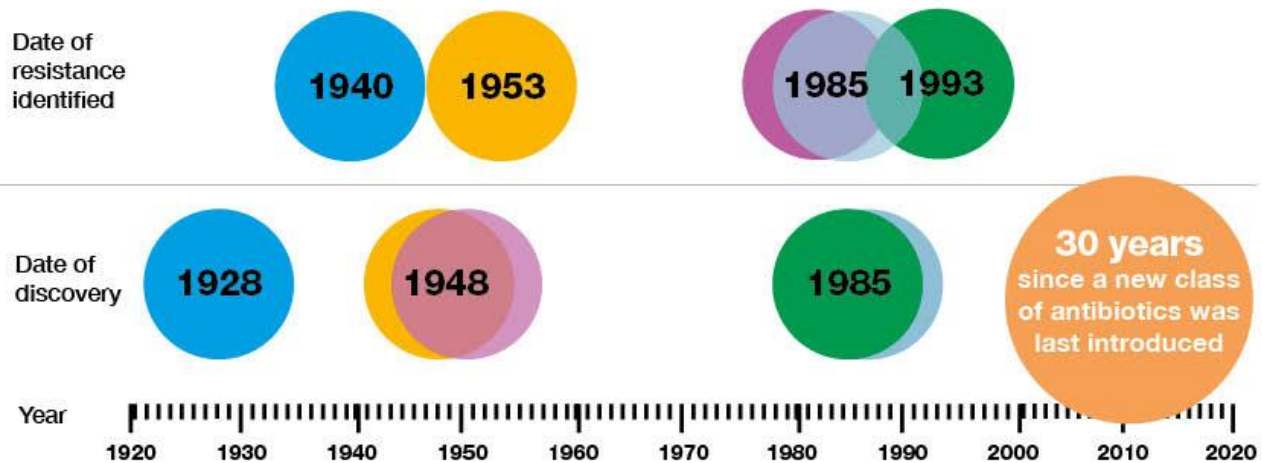
Classification & targets

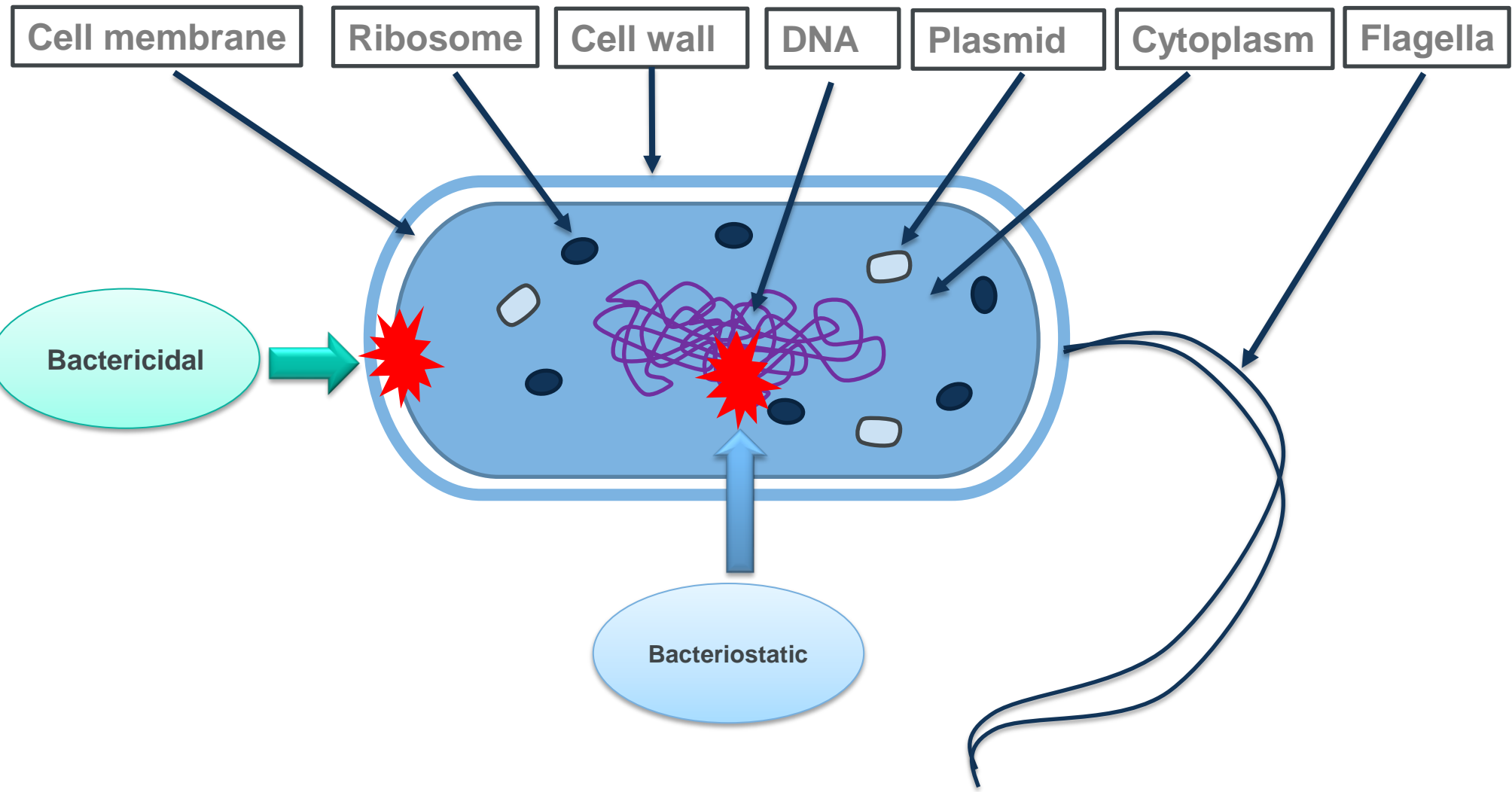
Novel antibiotic classes

Discovery

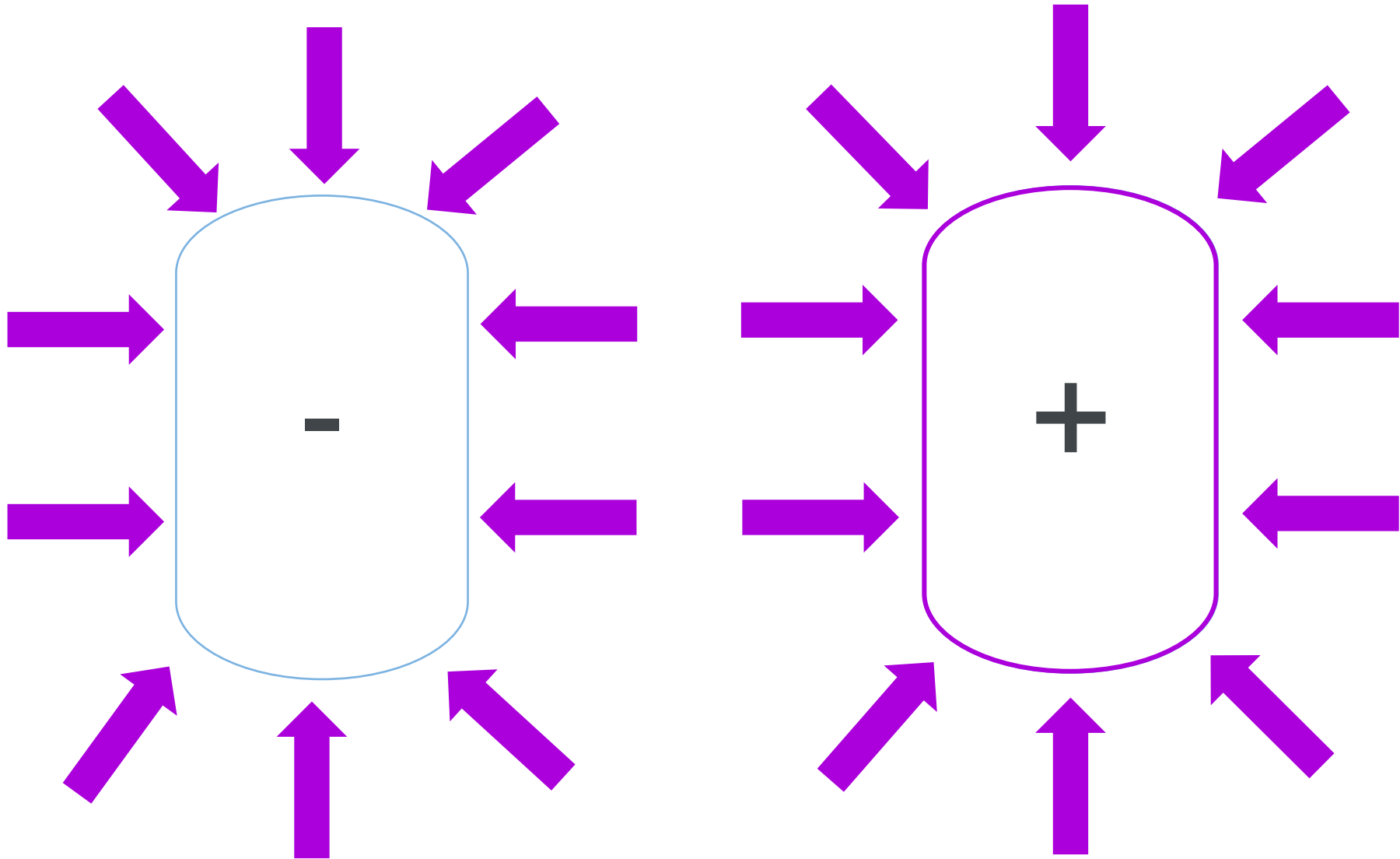
Antibiotic discovery and resistance timeline

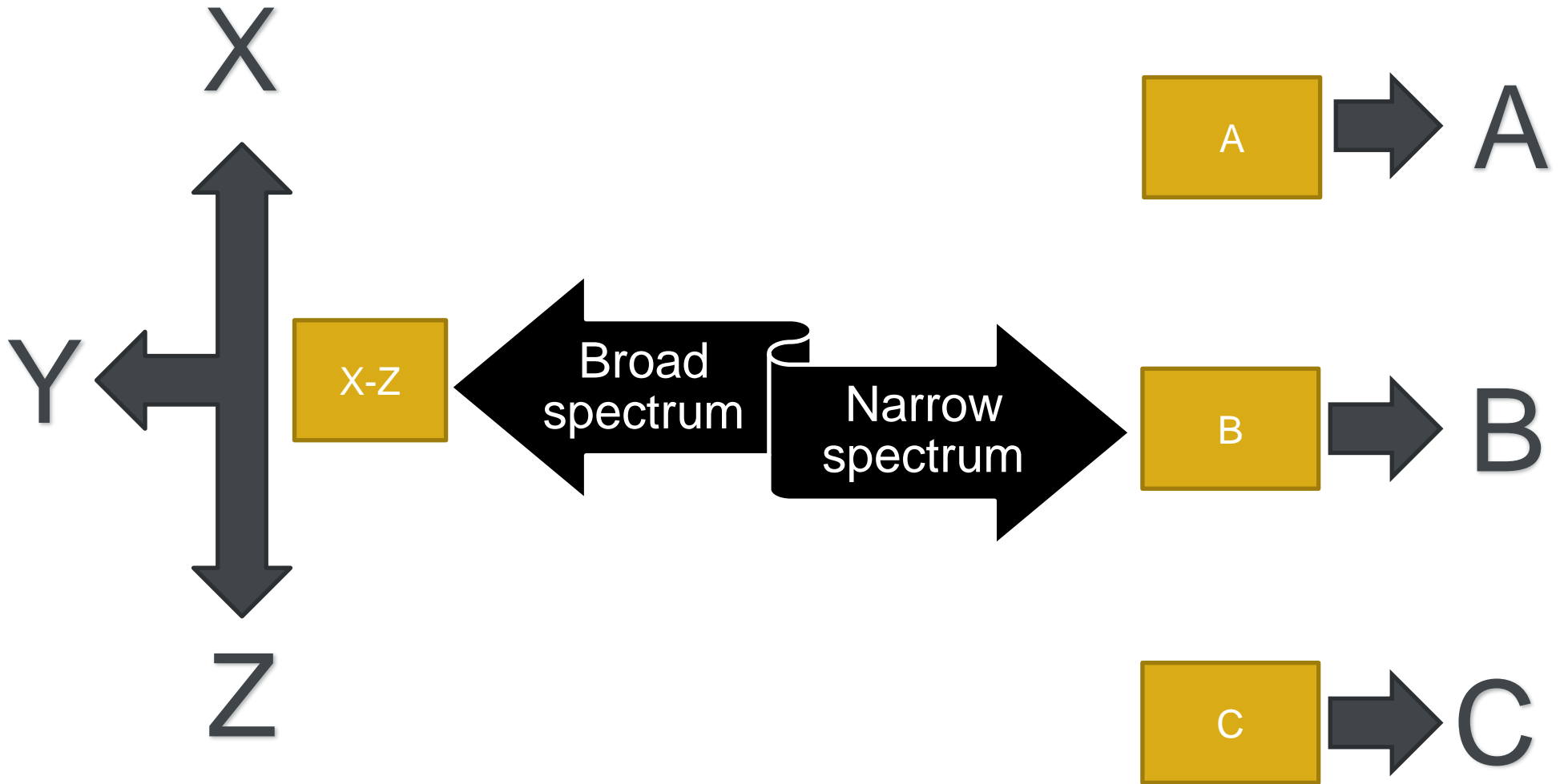
Antibiotic class

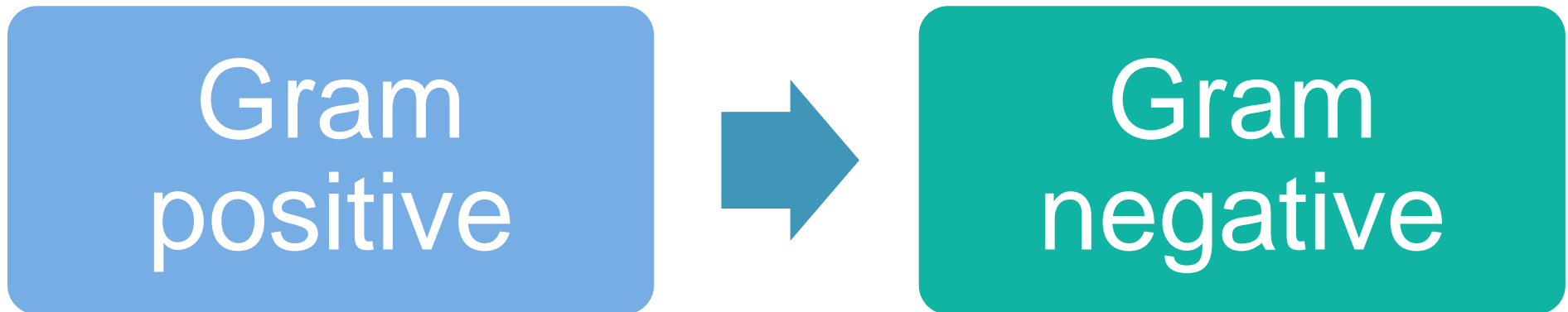
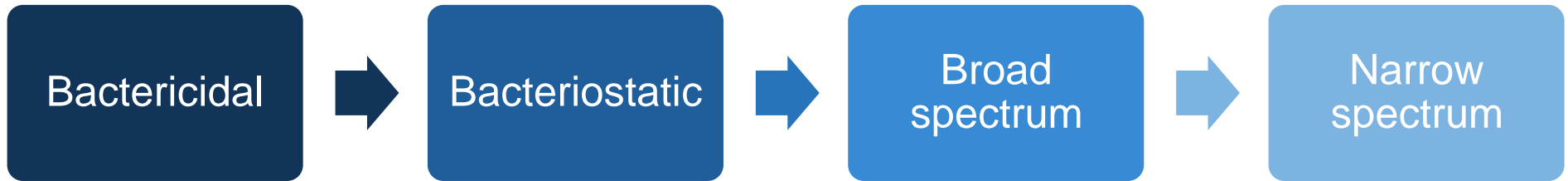




Gram stain









40 in trial

**2-4 'first-in-class'
compounds
required per decade**

**15 per decade to
include 2 new broad
spectrum classes**



Teixobactin

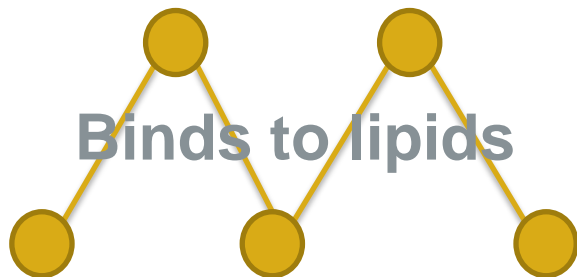


Brilacidin

Teixobactin

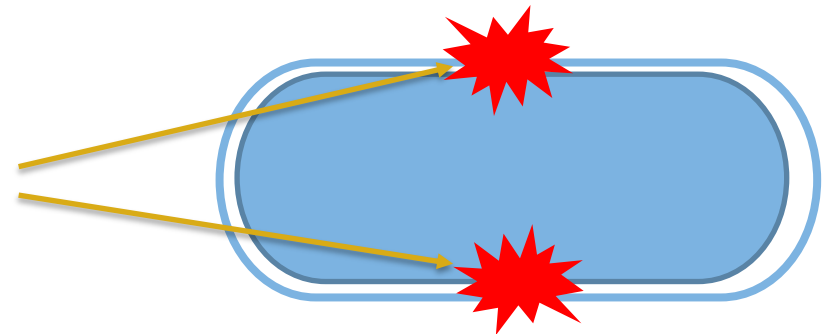


A device referred to by researchers as the 'ichip' was used to culture soil bacteria allowing nutrients and signal molecules to pass to the bacteria and stimulate growth



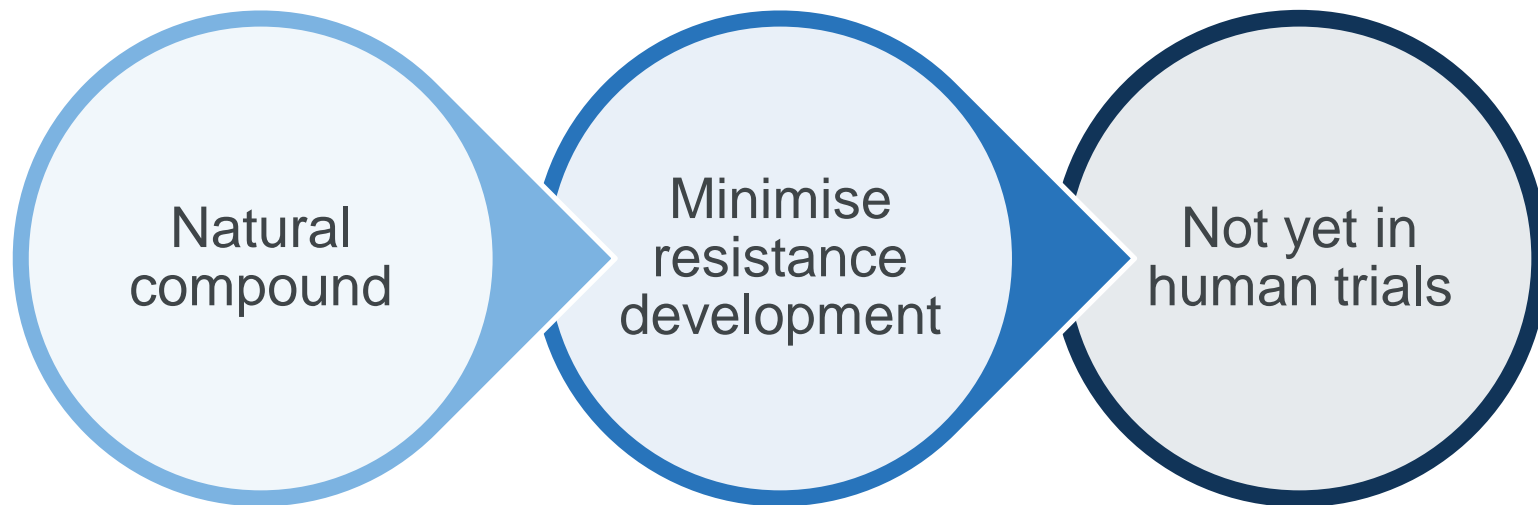
Binds to lipids

**Prevents
bacteria cell
wall synthesis**



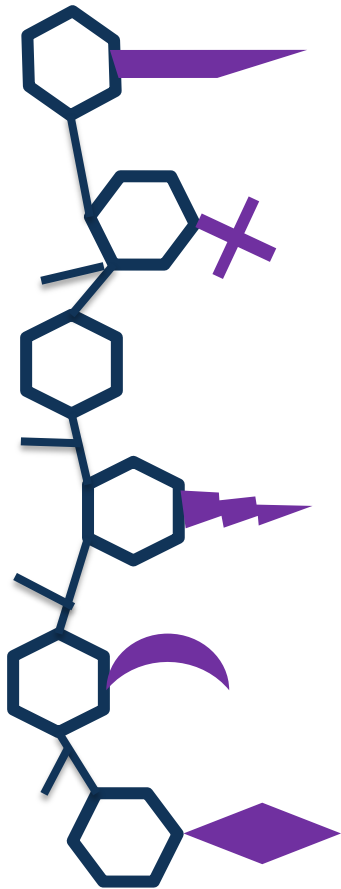
A new antibiotic kills pathogens without detectable resistance

Losee L. Ling^{1*}, Tanja Schneider^{2,3*}, Aaron J. Peoples¹, Amy L. Spoering¹, Ina Engels^{2,3}, Brian P. Conlon⁴, Anna Mueller^{2,3}, Till F. Schäberle^{3,5}, Dallas E. Hughes¹, Slava Epstein⁶, Michael Jones⁷, Linos Lazarides⁷, Victoria A. Steadman⁷, Douglas R. Cohen¹, Cintia R. Felix¹, K. Ashley Fetterman¹, William P. Millett¹, Anthony G. Nitti¹, Ashley M. Zullo¹, Chao Chen⁴ & Kim Lewis⁴

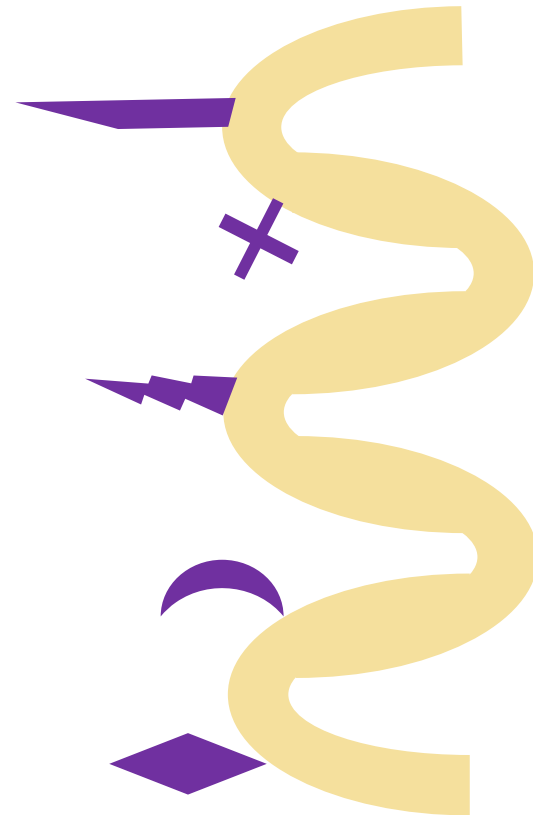
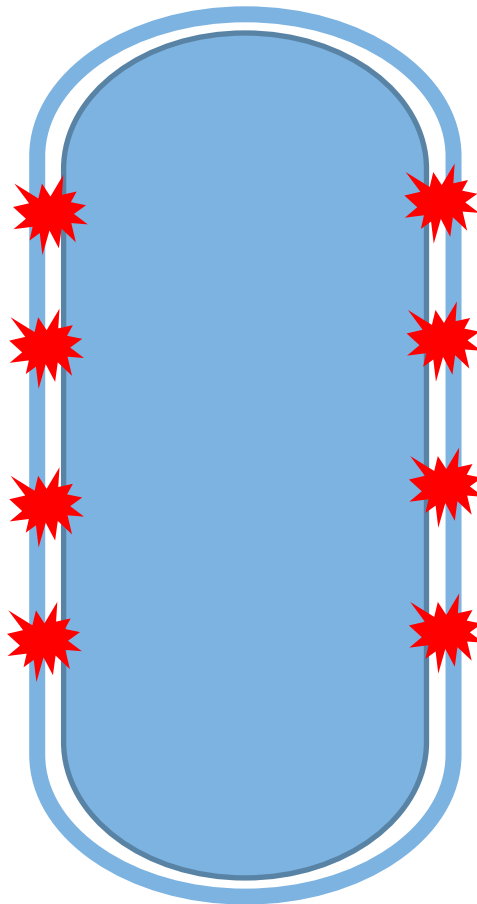


Brilacidin

Novel class of antibiotics -
'host defence protein mimetics'



Biomimetic polymer



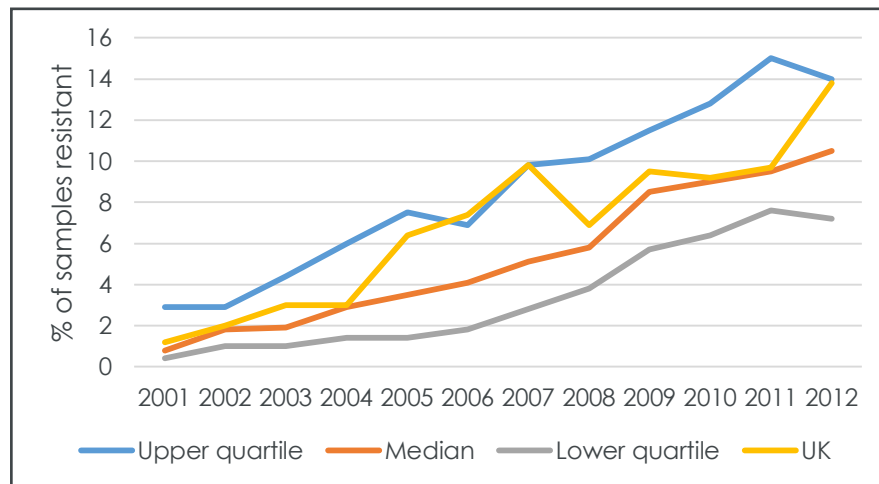
Host defence protein



“A Phase 3, Multicenter, Double Blind, Randomized Study to Evaluate the Efficacy and Safety of Single Dose IV Brilacidin versus IV Vancomycin Followed by Optional PO Linezolid for the Treatment of Patients with Acute Bacterial Skin and Skin Structure Infections (ABSSSI)”

Conclusion

- Some scope for optimism
- i-chip application could lead to development of many more potential antibiotic candidates
- However, new drug development should not be viewed as the solution to antibiotic resistance



Third-generation cephalosporin resistance rates in E. coli across Europe, showing the UK, 1999 to 2012 (Department of Health, 2015)



Questions



Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.