16 Mar 2022

bacterial resistance to antibiotics

antibiotics are ancient

- antibiotic resistant is also ancient
  (mobile ABR is more recent)
  - ↳ in human/animal lineages
- ABR is often found in antibiotic producers

- *methicillin-resistant Staph aureus
  MRSA
  multi-drug resistant MRSA
  extensively drug resistant tuberculosis
  (XDR)

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horizontal transfer
BETWEEN species.

- Collateral or non-target selection

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cost of resistance.

IMPLICATIONS • management.

- avoid overuse!
- AGRICULTURAL use
  - growth promoter
  - ?
  - agricultural use is important EARLY in the process of emergence
    - what new forms of resistance?
    - spillover events
- management

SINGLE antibiotic
↳ it doesn't matter!

MULTIPLE antibiotics -
- vary in space?
- cycle in time? ✗

cocktails

↳ Tb is an exception to general rules.

VIRUSES

- very similar physiology
- very high mutation rates
- control by priming immune system

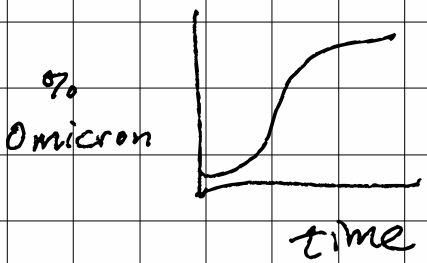
→ VACCINATION

- VACCINE ESCAPE

avoiding recognition.

STRAIN REPLACEMENT

↳ COVID-19!



- influenza

antigenic drift

antigenic shift

↳ recombination event

'ladder-like phylogeny'