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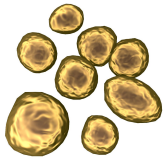

Antibiotics and Antibiotic Resistance

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Antibiotics

Antibiotics are powerful medicines that fight bacterial infection

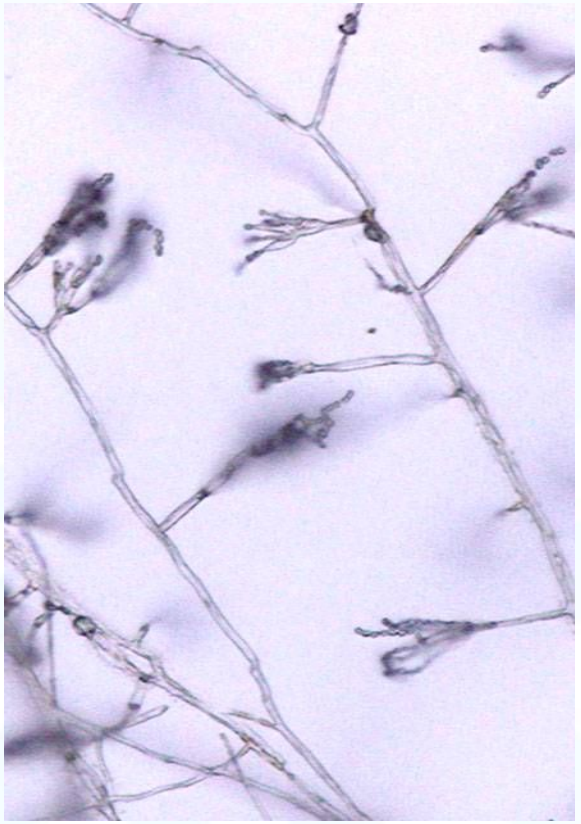
How antibiotics work

Antibiotics can be either

- Broad Spectrum
  - Kill a wide range of bacteria e.g. Penicillin
- Narrow Spectrum
  - Kill a specific type or group of bacteria e.g. Isoniazid

Antibiotics work in one of two ways

- Bactericidal
  - Kills the bacteria
- Bacteriostatic
  - Prevents the bacteria from dividing



Miracle Cure?

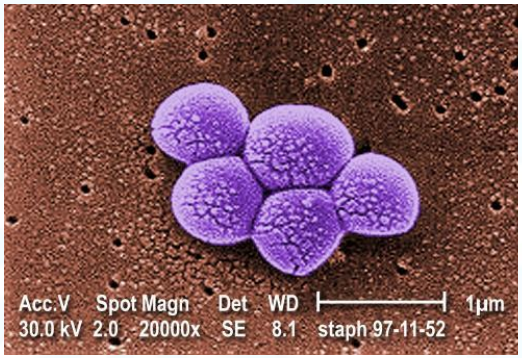
- Before the 1930s there were no treatments for bacterial infections
- Following the discovery of penicillin industry started searching for more antibiotics in nature
- Streptomycin was the first drug to have an effect on tuberculosis – a condition previously untreatable
- Surgeons could attempt more dangerous operations

Overuse of antibiotics can damage our normal/good bacteria.

- Many antibiotics prescribed by the doctor are broad spectrum
- These kill the body's good bacteria as well as the bad

Antibiotics resistance

- Many bacteria have developed the ability to become resistant to antibiotics.
- These bacteria are now a major threat in our hospitals.

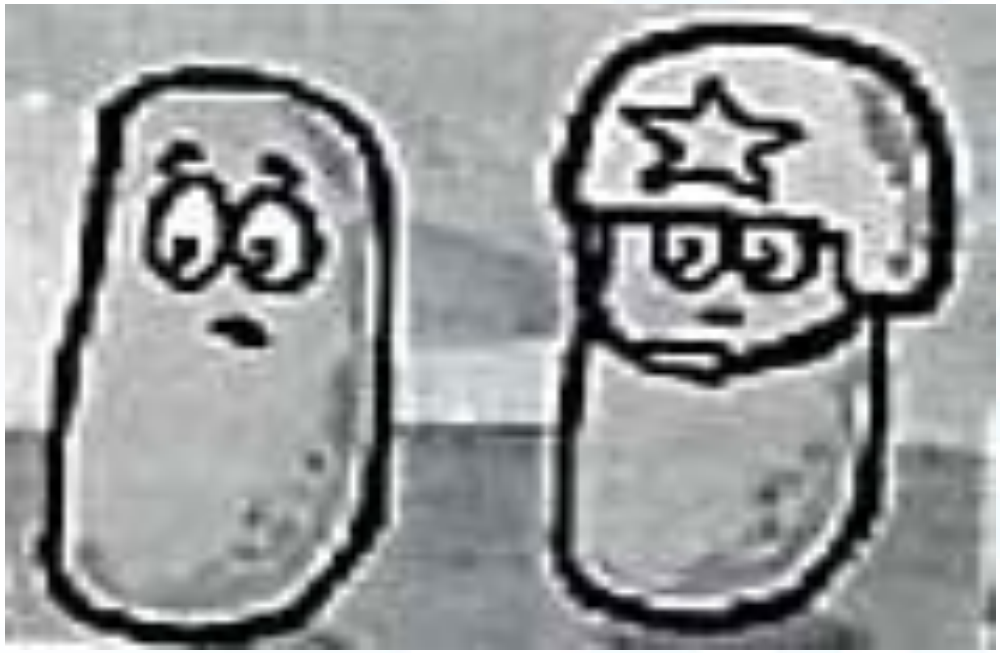


Antibiotic Resistance

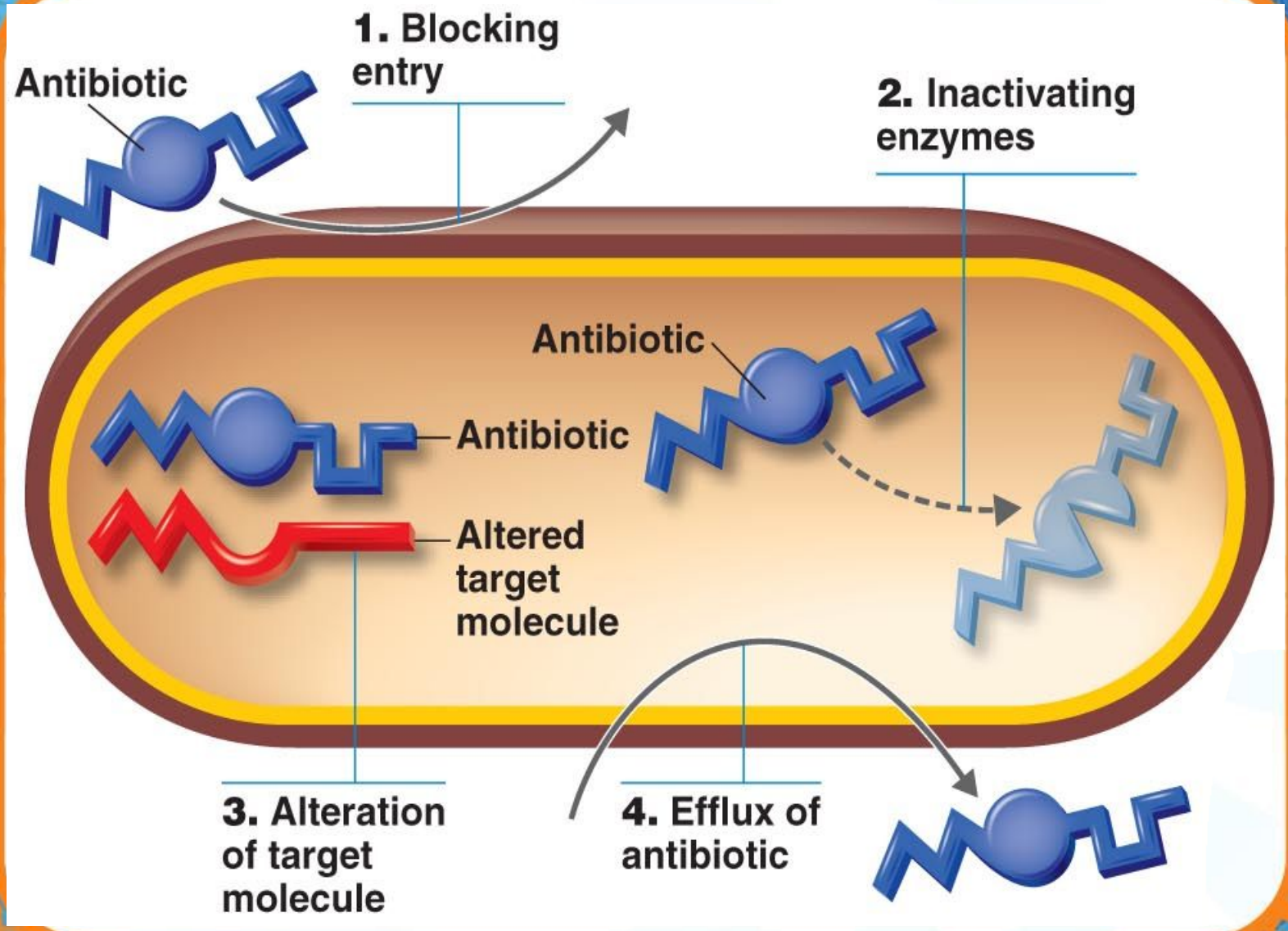
Causes

- Antibiotics used to treat infections when they are not needed or not effective i.e. for the flu
- Patients not finishing the entire antibiotic course
- Overuse of antibiotics
  - Over-prescription of antibiotics
  - Poor hygiene and sanitation
- Not completing a prescribed course
- Using antibiotics not prescribed for you

How does resistance develop?

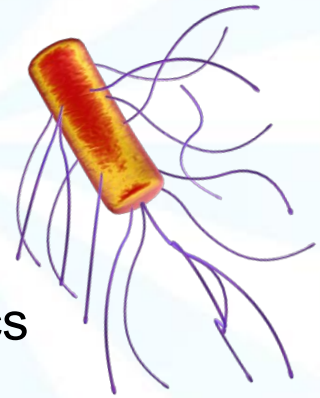


- A variety of mutations can lead to antibiotic resistance
- Mechanisms of antibiotic resistance
  1. Enzymatic destruction of drug
  2. Prevention of penetration of drug
  3. Alteration of drug's target site
  4. Rapid ejection of the drug
- Resistance genes are often on plasmids or transposons that can be transferred between bacteria


1. Blocking entry
Antibiotic
2. Inactivating enzymes
Antibiotic
Antibiotic
Altered target molecule
3. Alteration of target molecule
4. Efflux of antibiotic

How antibiotic resistance can be prevented

- Antibiotics should be the last line of defence NOT the first
  - Most common infections will get better by themselves through time, bed rest, liquid intake and healthy living.
- Only take antibiotics prescribed by a doctor
- If prescribed antibiotics, finish the course.
- Do not use other peoples or leftover antibiotics
  - they be specific for some other infection



Thank you