FRONTIERS – EMERGING ISSUES OF GLOBAL CONCERN

ANTIBIOTIC RESISTANCE:
CALLING ON CITIZENS TO HELP TACKLE THE PROBLEM

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FRONTIERS QUIZ

Question 1: Antibiotics are powerful medicines that help fight:

(a) Viruses
(b) Bacteria
(c) All microbes

Question 2: Antibiotic resistance happens when my body becomes resistant to antibiotics:

(a) True
(b) False

Question 3: Antibiotic-resistant bacteria can spread to humans through:

(a) Contact with a person who has an antibiotic-resistant infection

(b) Contact with something that has been touched by a person who has an antibiotic-resistant infection

(c) Contact with a live animal, food or water carrying antibiotic-resistant bacteria.

(d) All the above

Question 4: What can happen if I get an antibiotic-resistant infection?

(a) I may be sick for longer

(b) I may have to visit my doctor more or be treated in hospital

(c) I may need more expensive medicines that may have side-effects

(d) All the above

Question 5: I can help tackle antibiotic resistance if I:

(a) Share my antibiotics with my family when I am sick

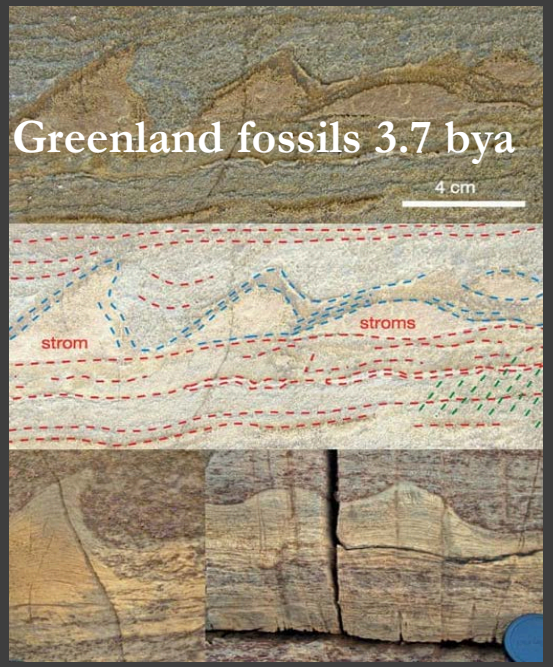
(b) Get antibiotics as soon as I feel sick - either directly from the pharmacy or a someone with the same symptoms

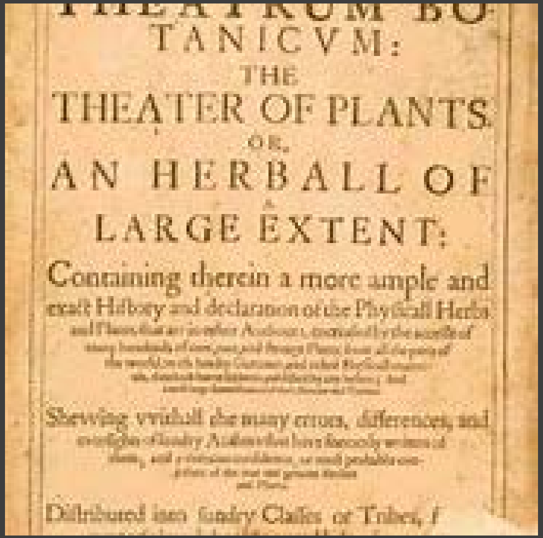
(c) Throw away any left-over antibiotics into the toilet

(d) Stop taking the antibiotics as soon as I feel well

(e) Keep my vaccinations up to date

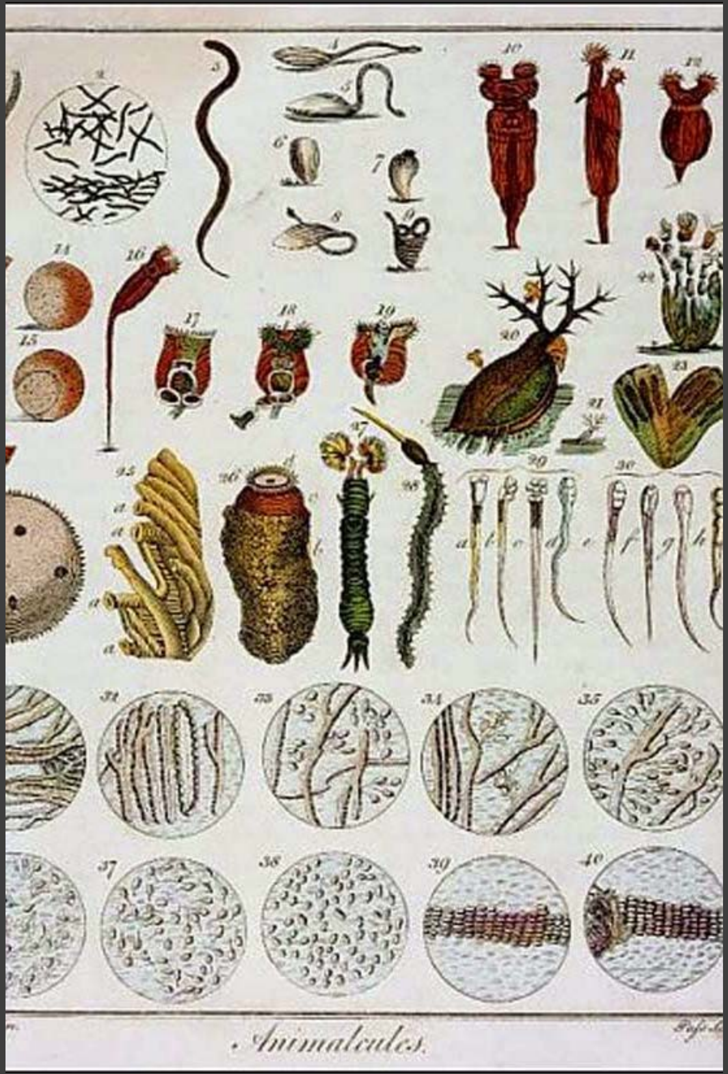
BACTERIAL ORIGINS




THEATRUM BO-
TANICVM:
THE
THEATER OF PLANTS.
OR,
AN HERBALL OF
A
LARGE EXTENT:
Containing therein a more ample and
exact History and declaration of the Physicall Herbs
and Plants

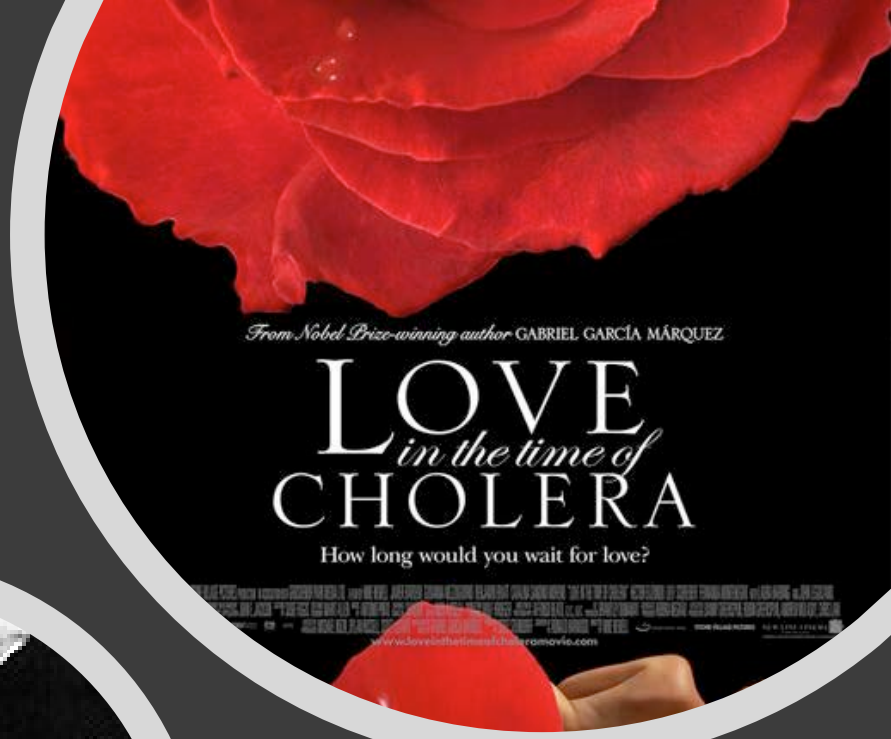
Shewing withall the many errors, differences, and

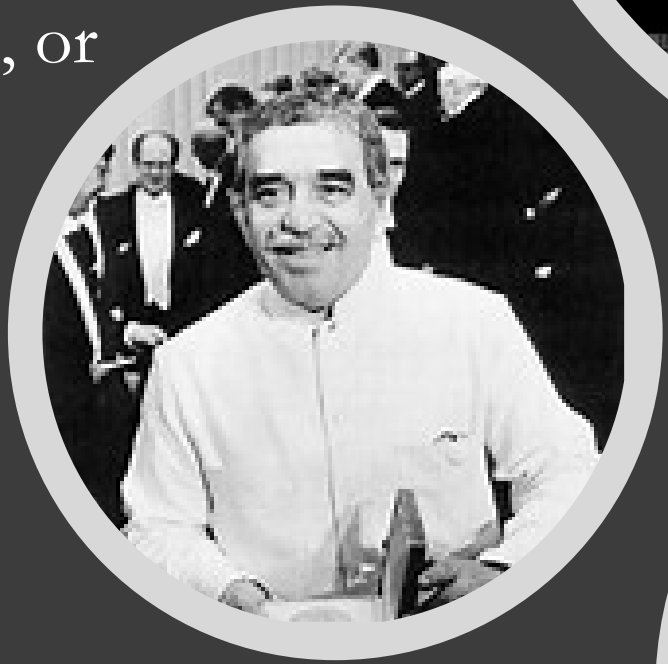
Distributed into sundry Classes or Tribes,



One sometimes finds, what one is not looking for. When I woke up just after dawn on September 28, 1928, I certainly didn't plan to revolutionize all medicine by discovering the world's first antibiotic, or bacteria killer. But I suppose that was exactly what I did.

— *Alexander Fleming*

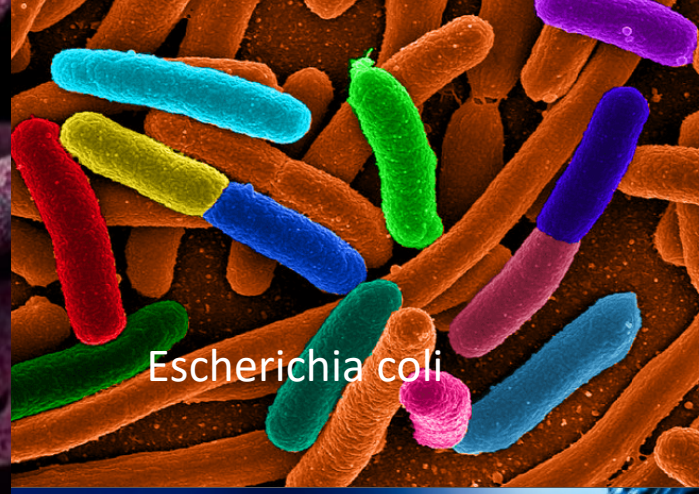





Tuberculosis


Pasturella


Campylobacteria


Escherichia coli

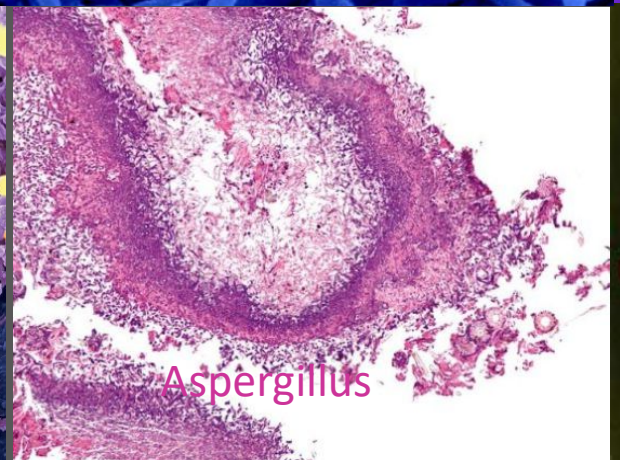

Streptococcus


Vibrio cholera


Salmonella

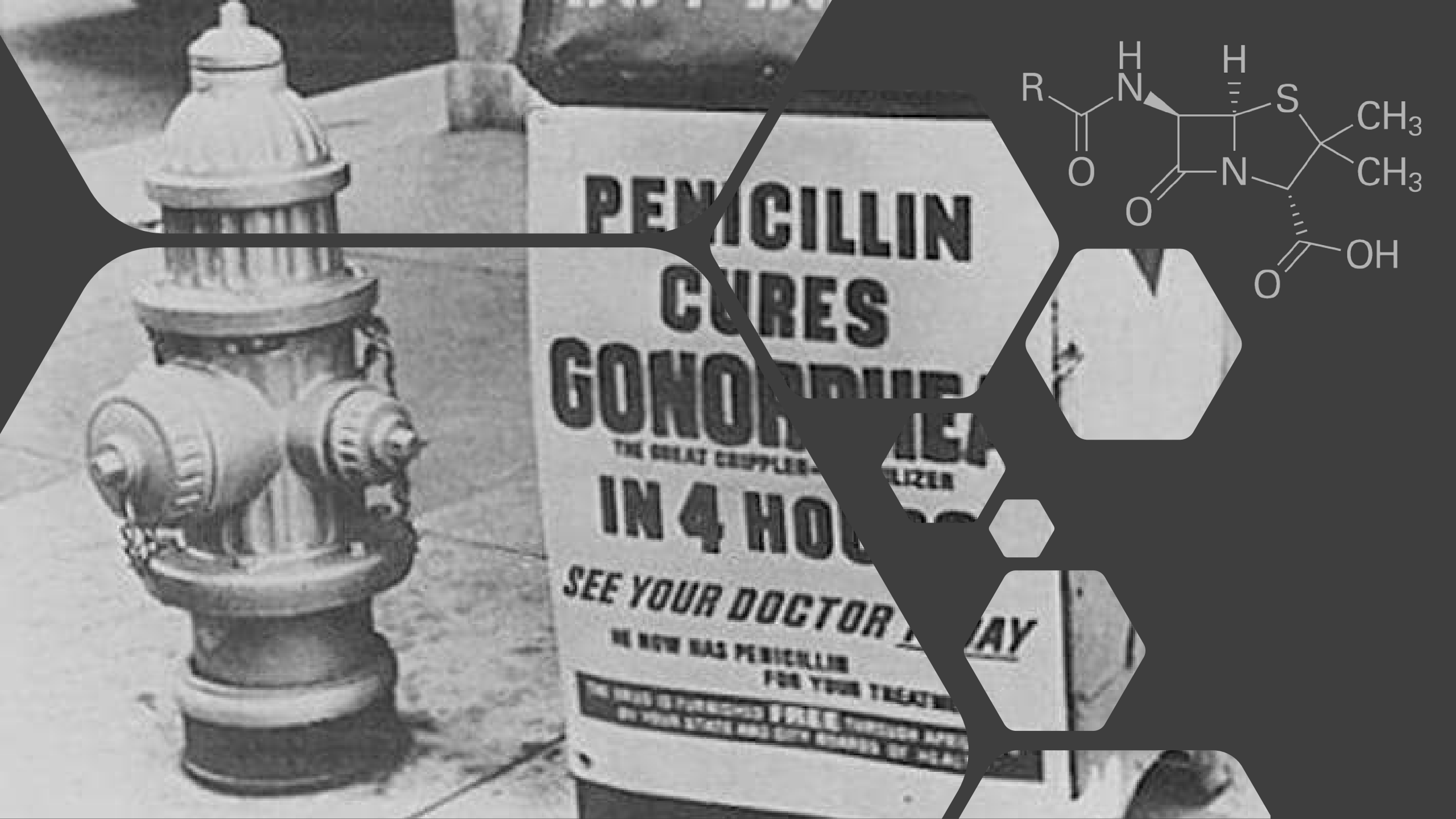

Legionella


Staphylococcus


Aspergillus


Brucella


Cholera


PENICILLIN
CURES
IN 4 HO
SEE YOUR DOCTOR
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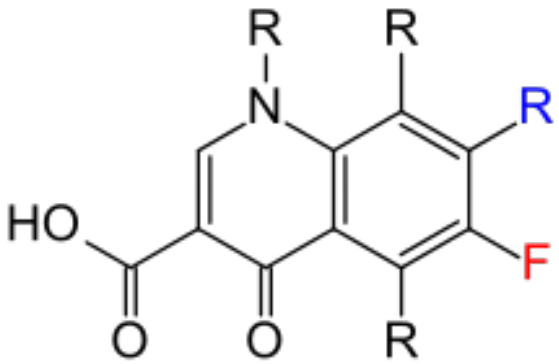
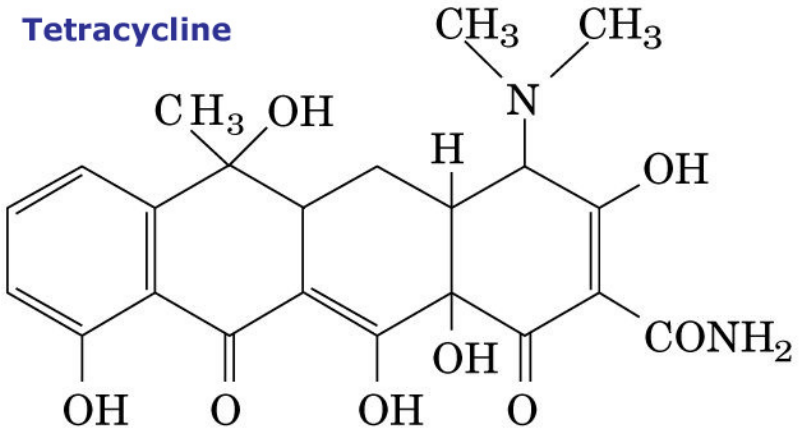
ANTIBACTERIAL AGENTS

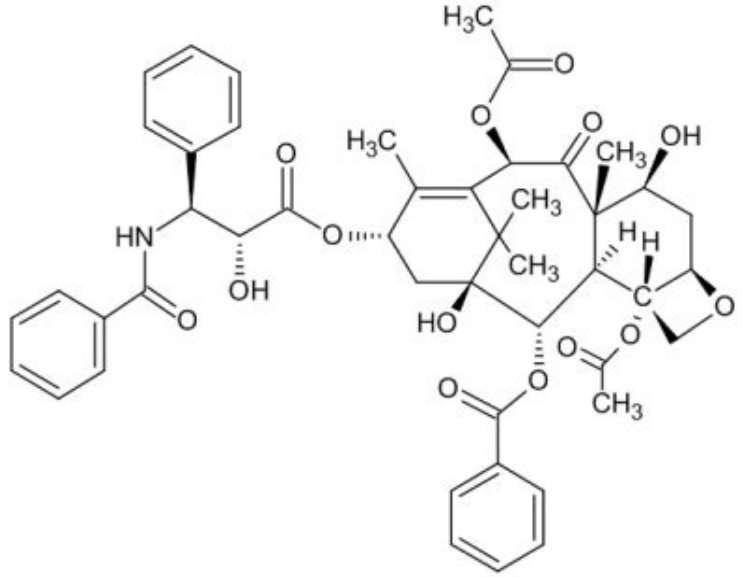
Fluoroquinolone

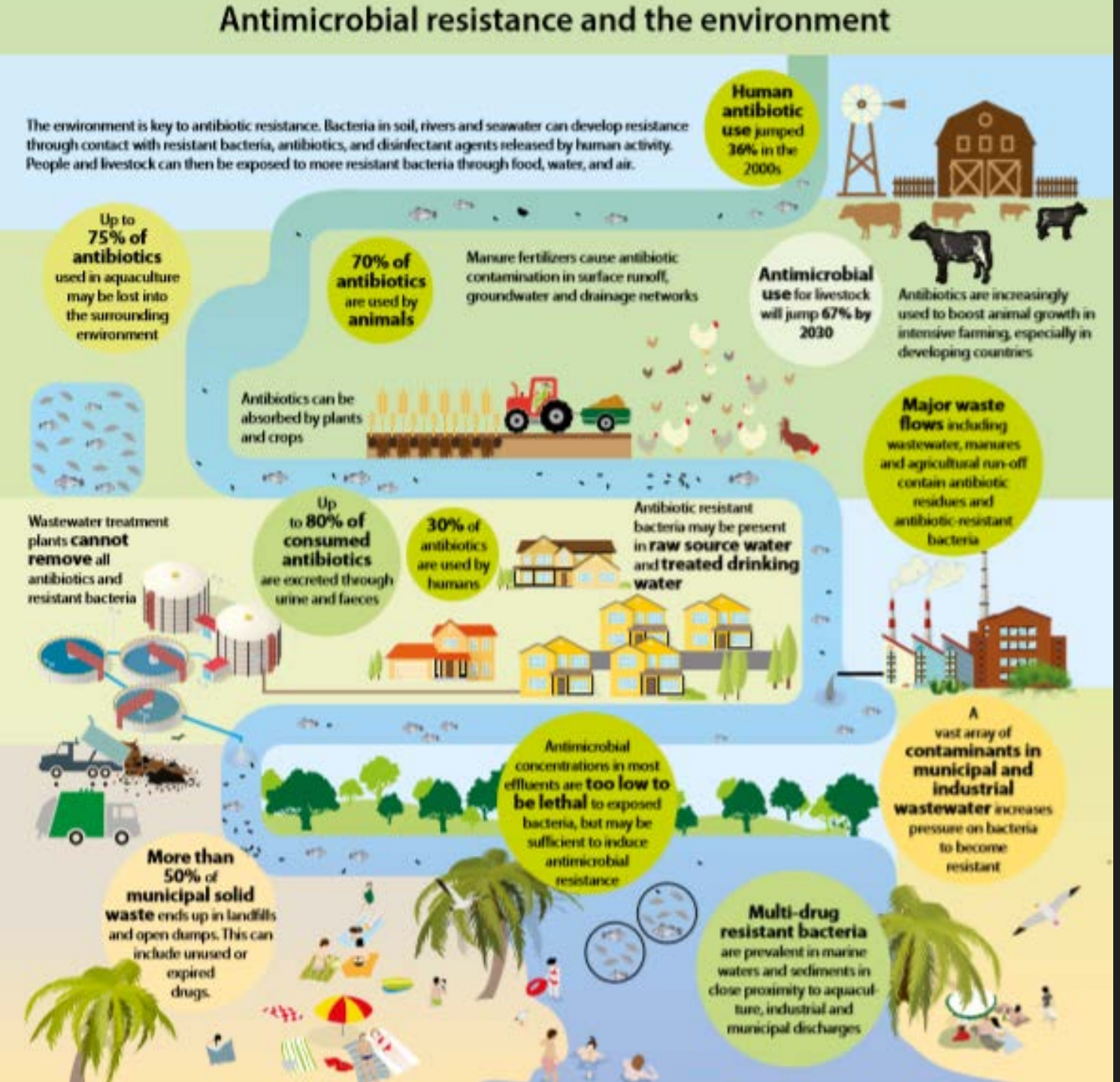


Tetracycline



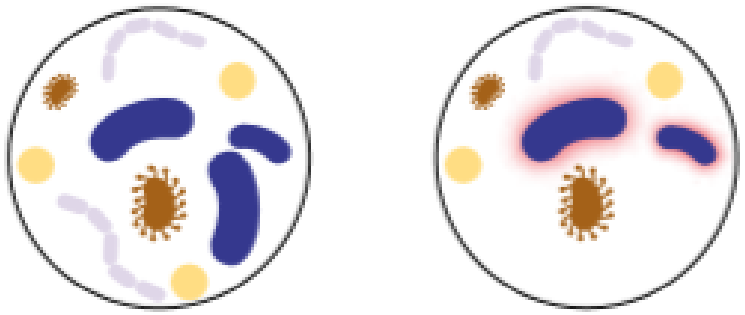
Micrococcin



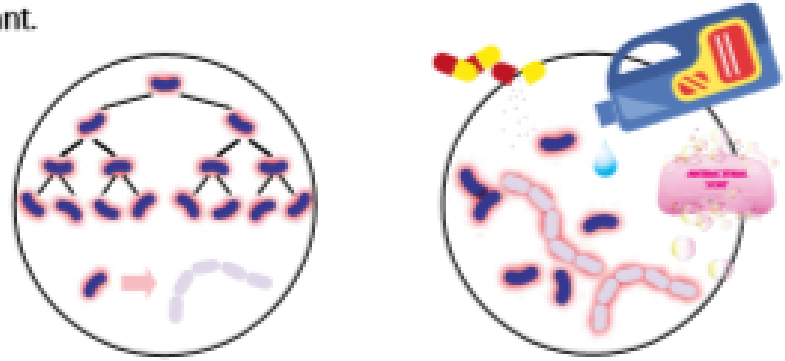


Inadequately treated water
Improper disposal
Agricultural run-off

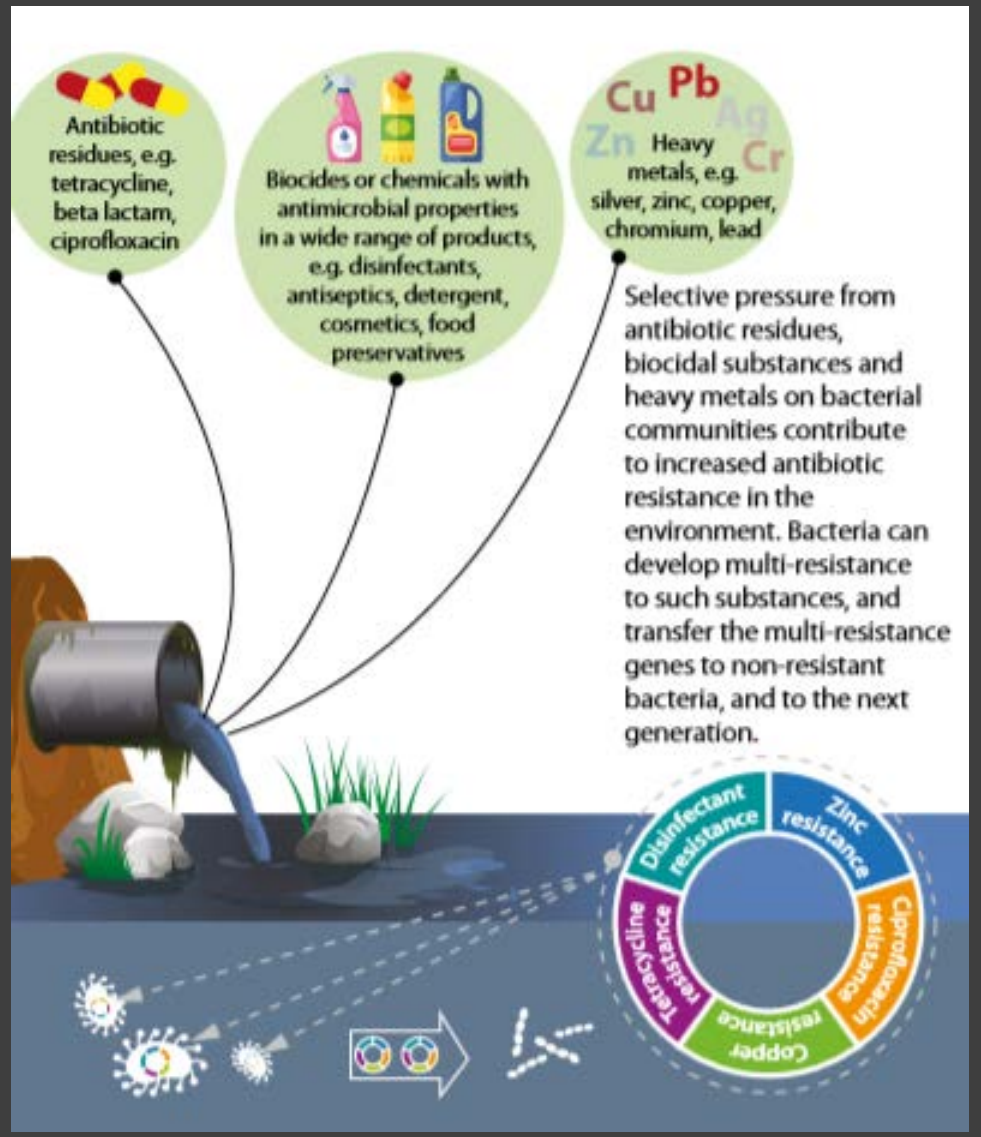
NATURAL SELECTION AND CO-SELECTION OF RESISTANCE

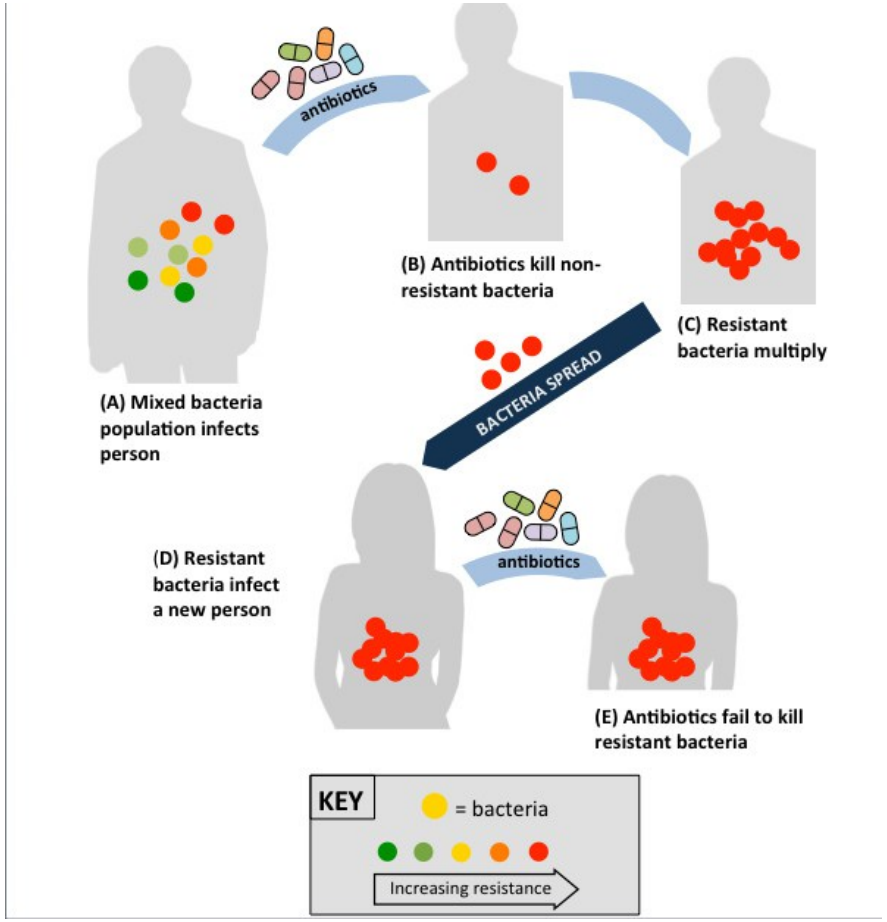


In the microbial world, competition always occurs between organisms by way of producing antibiotic molecules to inhibit others from thriving. Susceptible organisms perish. However, bacteria and fungi are known to have developed defence mechanisms to resist the antibiotic attack and survive, or in other words, become antibiotic resistant.

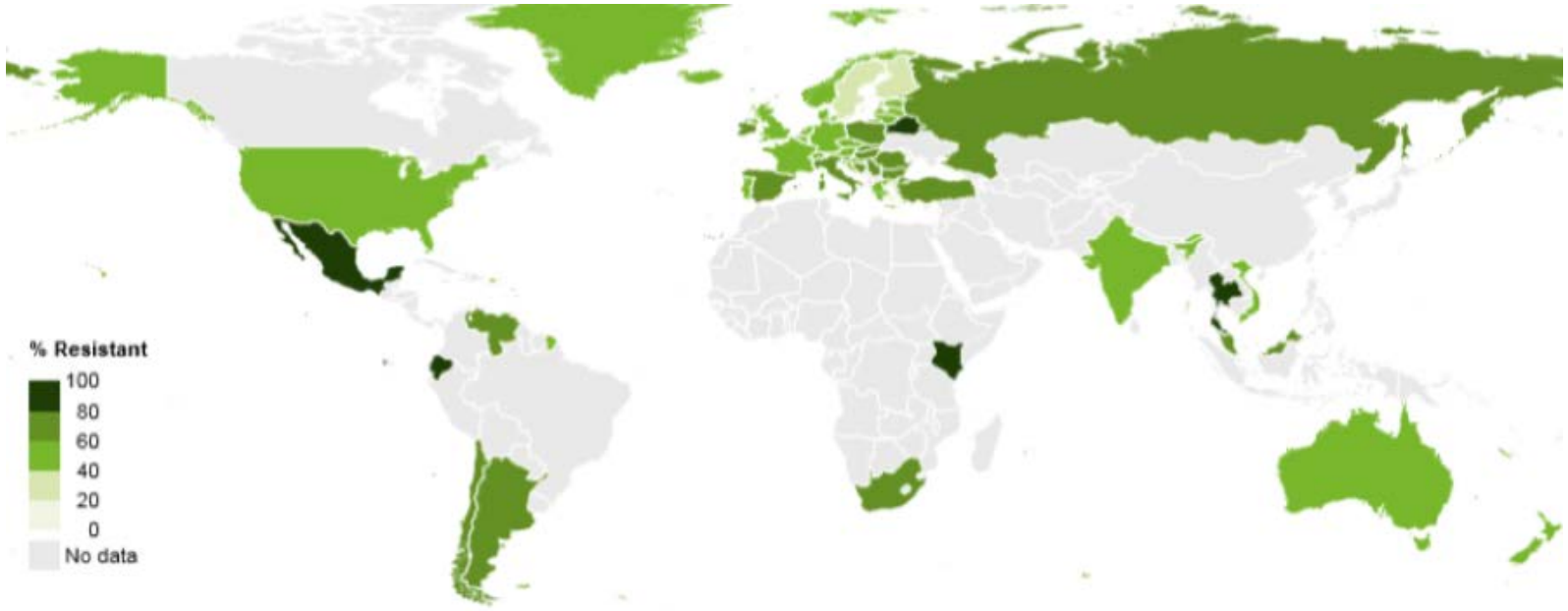


Resistance genes can pass to the next generation, and even between un-related bacteria via horizontal gene transfer. Overuse and misuse of antibiotic drugs as well as increased exposure to antimicrobial substances in the environment increases selection for antibiotic resistance among bacteria.



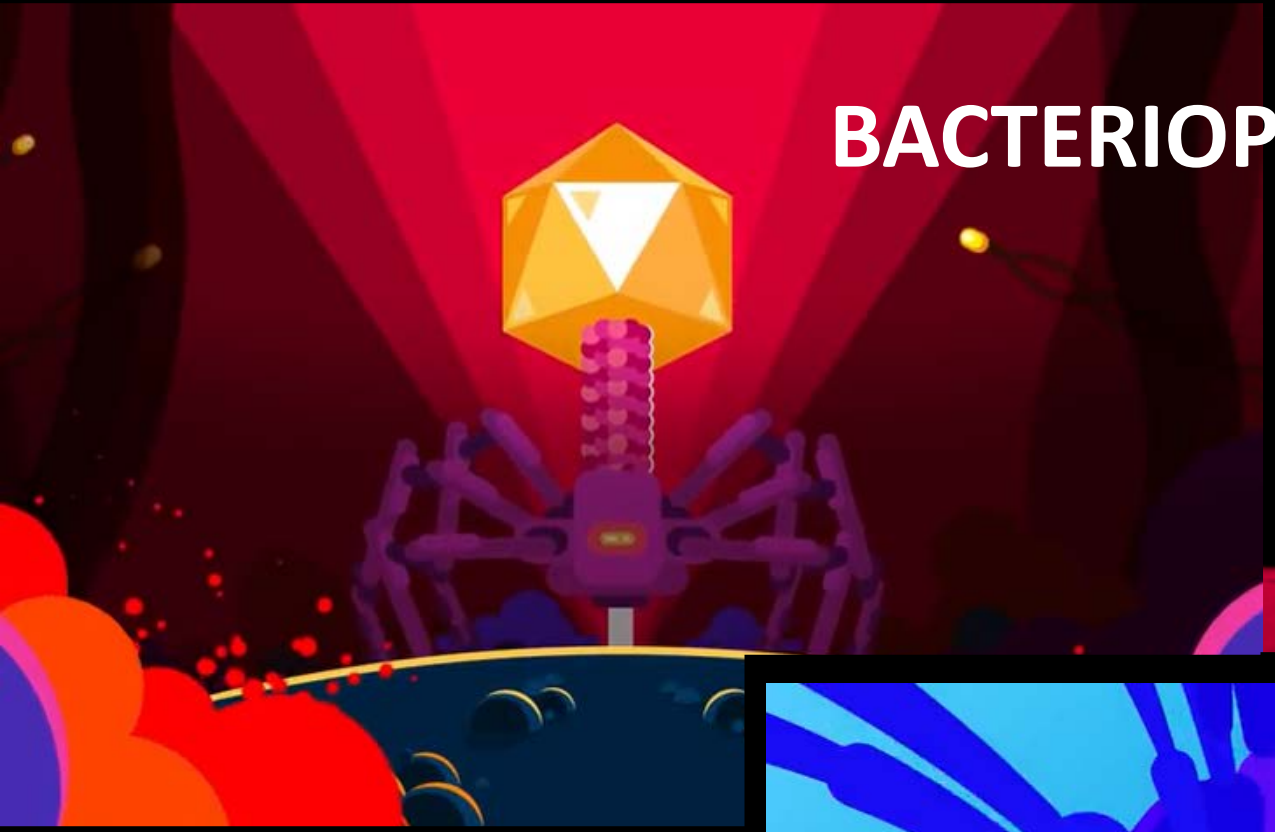


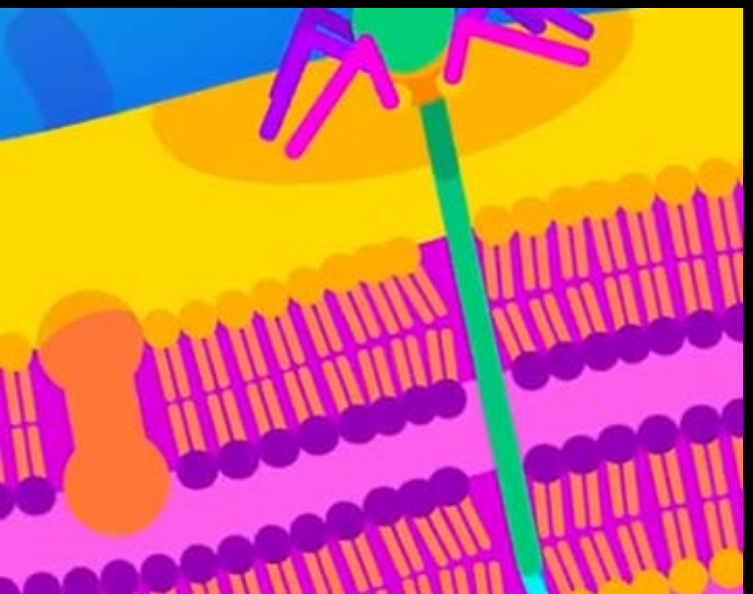
Percentage of invasive E. coli isolates resistant to Aminopenicillins

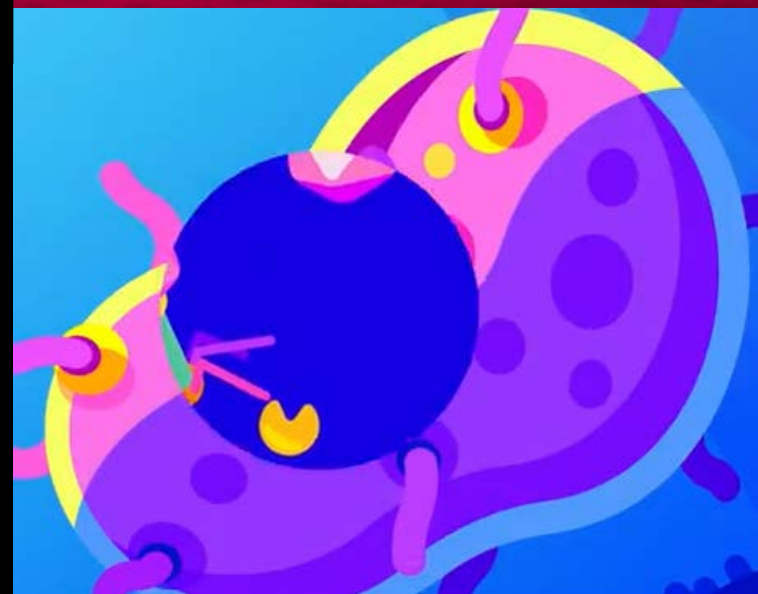


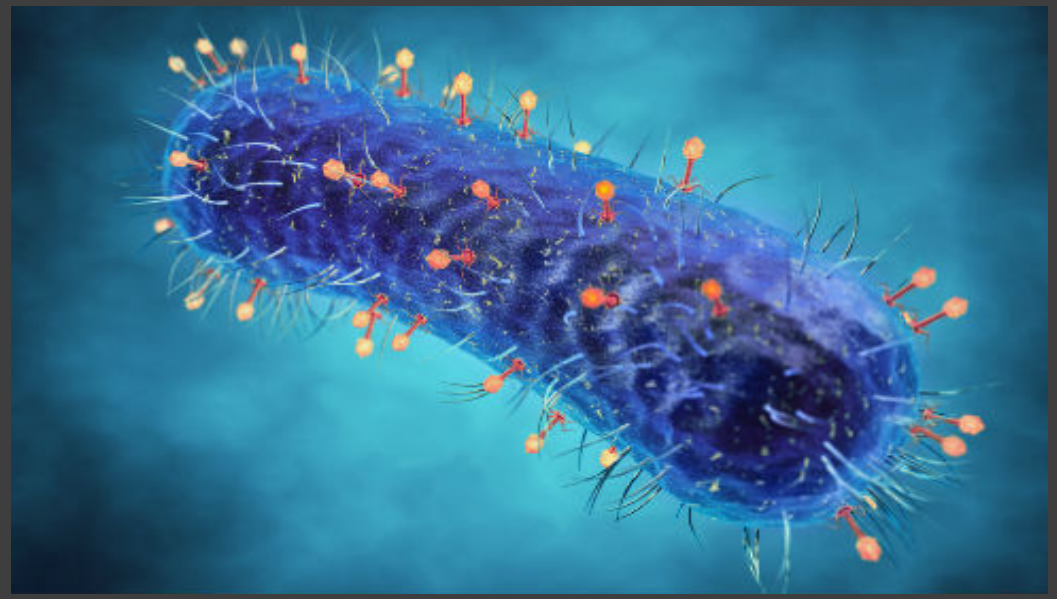
Courtesy of The Center for Disease Dynamics, Economics & Policy (CDDEP). For more resistance maps, visit https://resistancemap.cddep.org/AntibioticResistance.php

BACTERIOPHAGE ATTACK

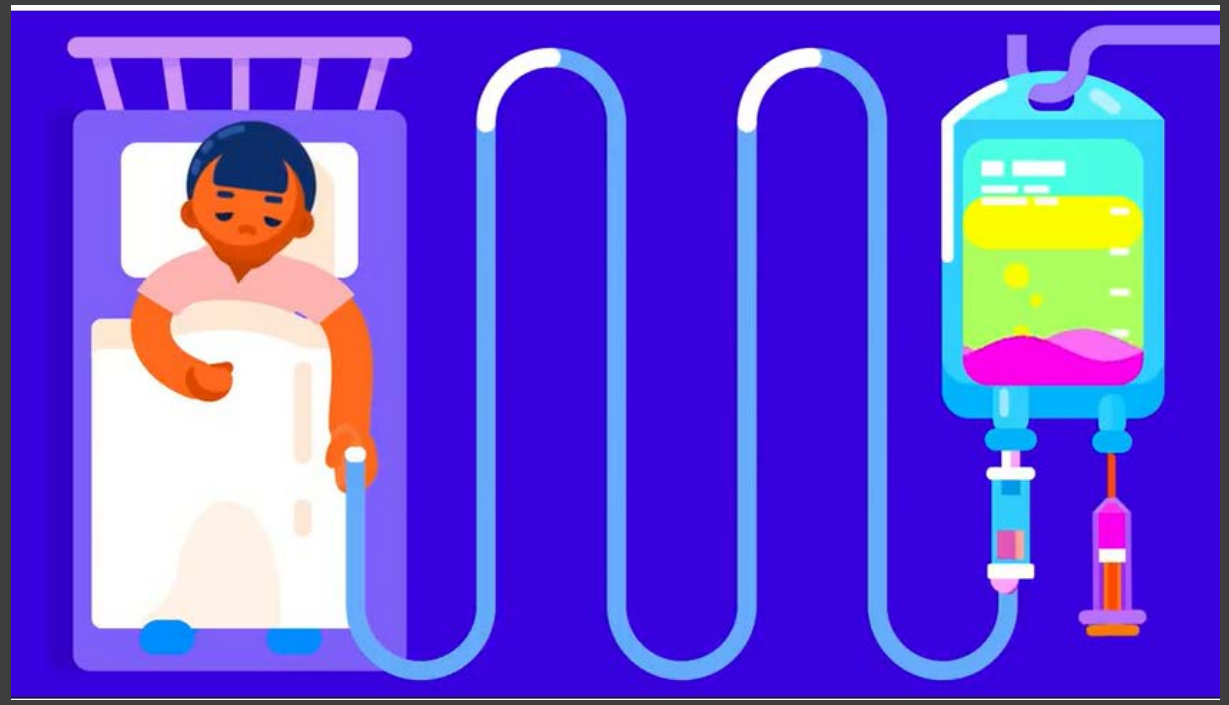




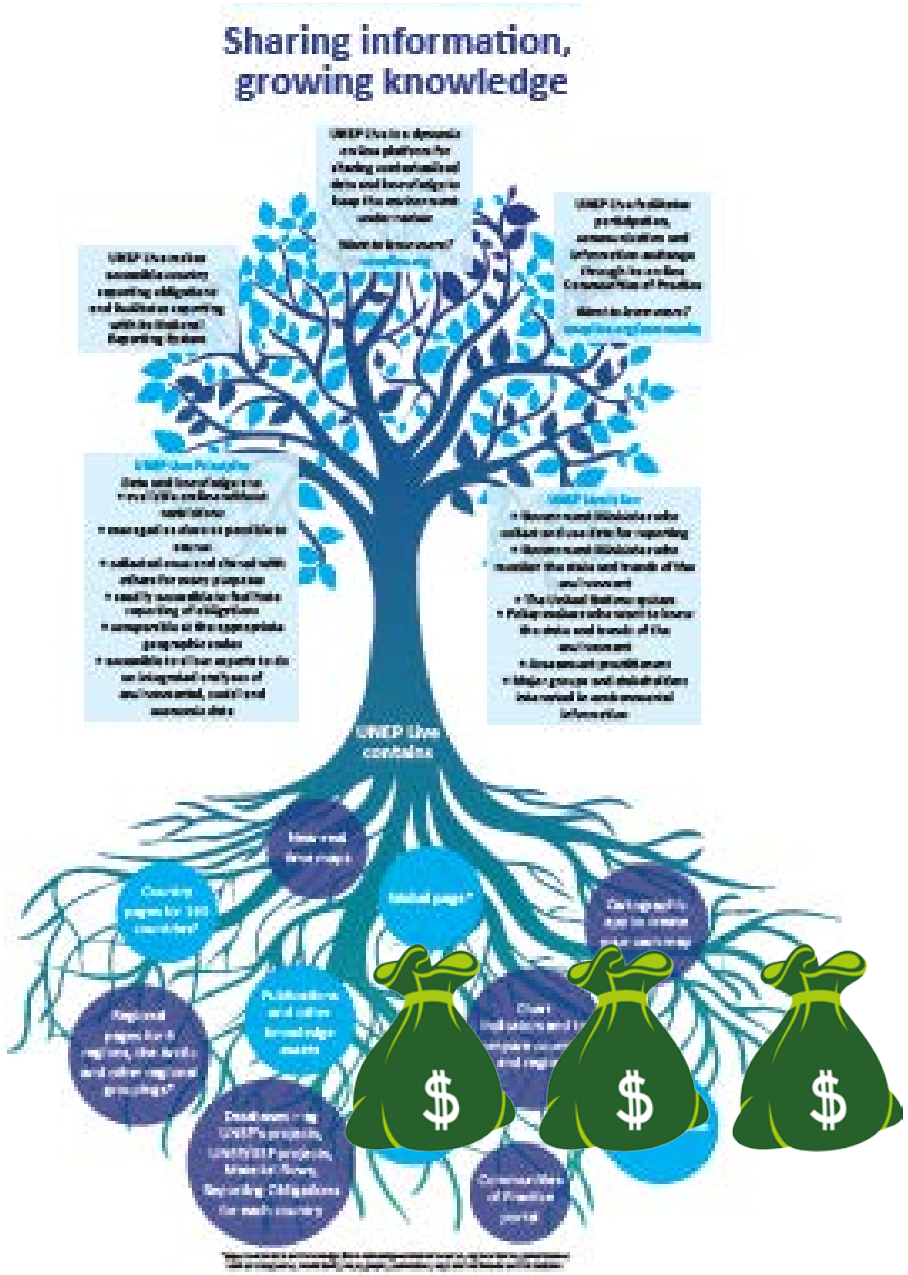


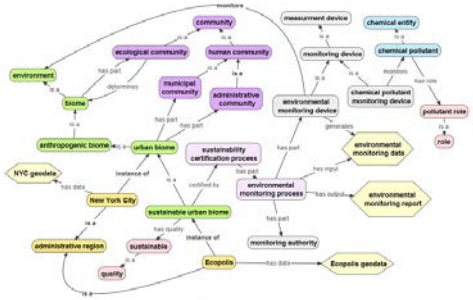


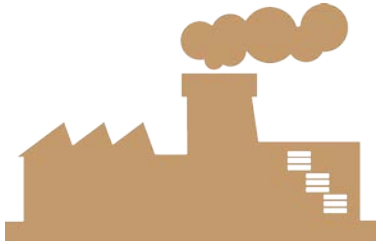
PHAGE THERAPY



Combinatorial Knowledge











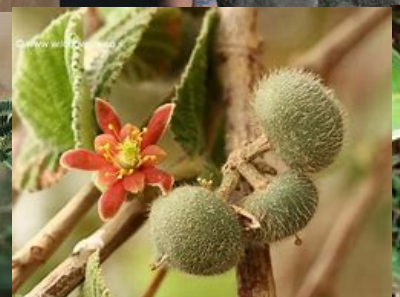











Grewia villosa
Commiphora africana
Acacia nilotica
Acokanthera schrimpi
Bersama abyssinica
Dodomaea angustifolia
Plumbago zeylanica
Lippia kituiensis
Dombeya rotundiflora
Cassia abbreviate
Warburgia ugandensis
Croton dichogamus
Balanites aegyptiaca

Question 1: Antibiotics are powerful medicines that help to fight:

(b) Bacteria.

Question 2: Antibiotic resistance happens when my body becomes resistant to antibiotics:

(b) False

Question 3: Antibiotic-resistant bacteria can spread to humans through:

(d) All of the above

Question 4: What can happen if I get an antibiotic infection:

(d) All of the above

Question 5: I can help tackle antibiotic resistance if I:

(d) Keep my vaccinations up to date