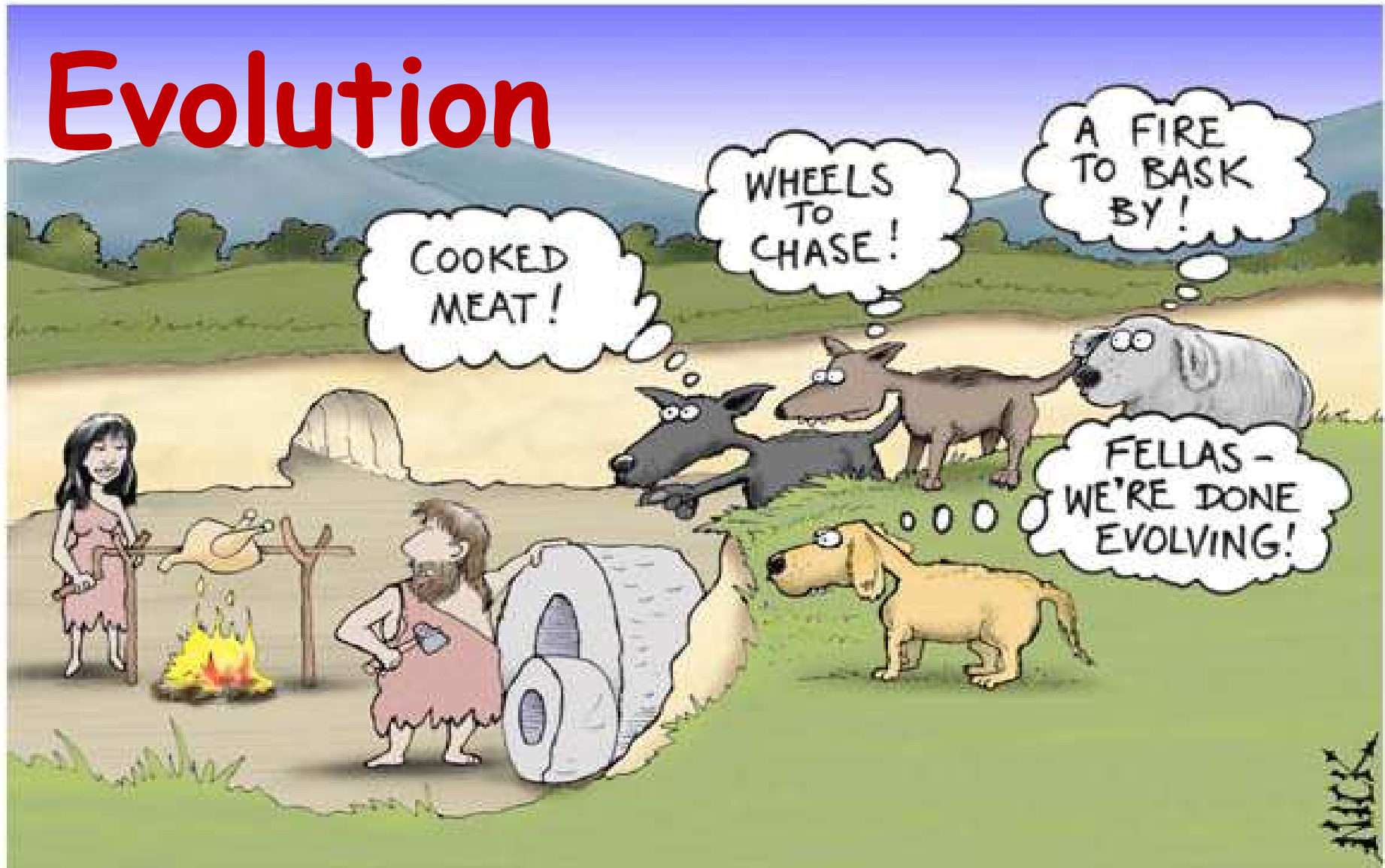


Evolution



Forget the experts; domestication of the dog only took about 8 seconds.

Courtesy /www.lab-initio.com

Definitions

Evolution: the change in frequency of genes within a population

Population: is all the individuals of a species that live in an area

Variation: heritable differences that exist in a population

Adaptation: a variation that allows an individual to survive better than other individuals

Important Considerations

Individuals **CANNOT** evolve. Only populations can evolve.

The most **successful** members of a population are the ones that have the most surviving offspring. They have made the greatest contribution to the **gene pool**.

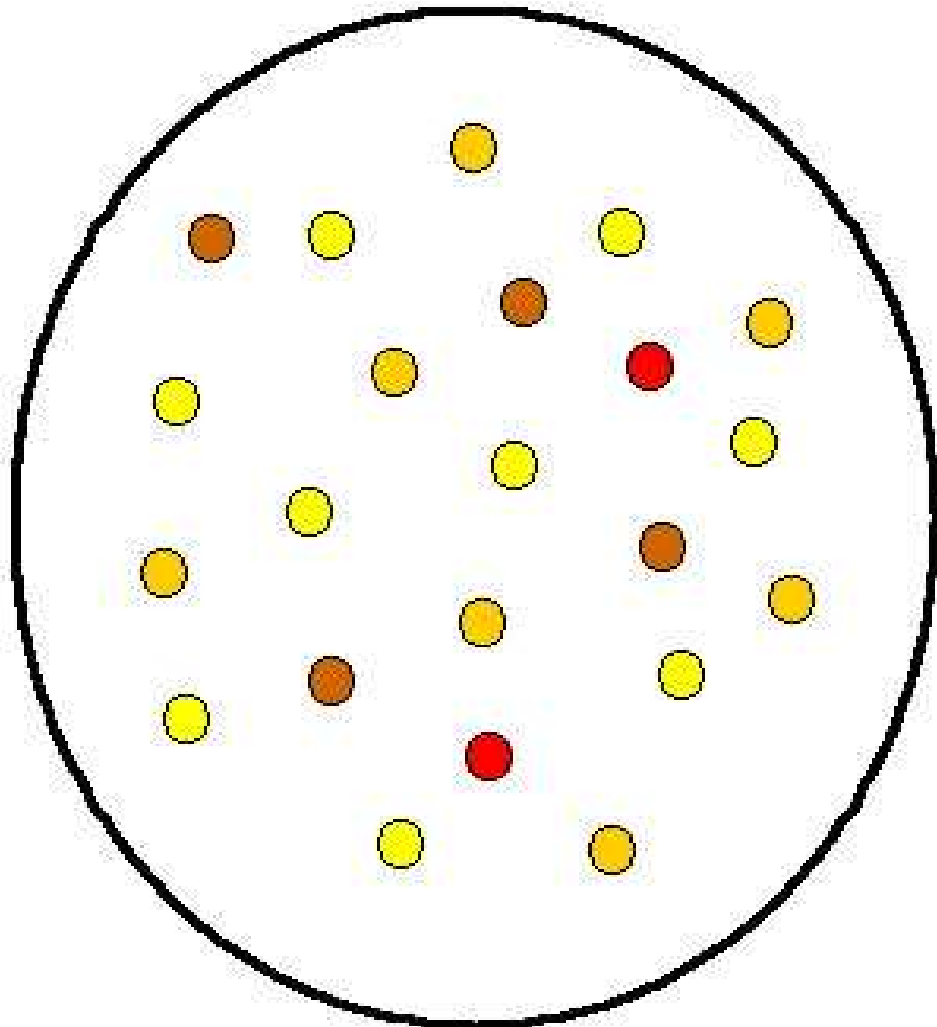
What Could Cause Gene Frequencies to Change?

- Natural Selection
- Migration
- Random mutations
- Accidents (within small populations)
- Artificial Selection
- Genetic Engineering

Case Study: Antibiotic Resistant Bacteria

- Antibiotics are drugs that kill bacteria by interfering with their metabolic processes
- The first antibiotic was penicillin, and became available for medical use during WWII.
- Certain genes may confer antibiotic resistance upon a bacteria.
- Antibiotic resistant bacteria are becoming a medical emergency

Antibiotic Resistance #1

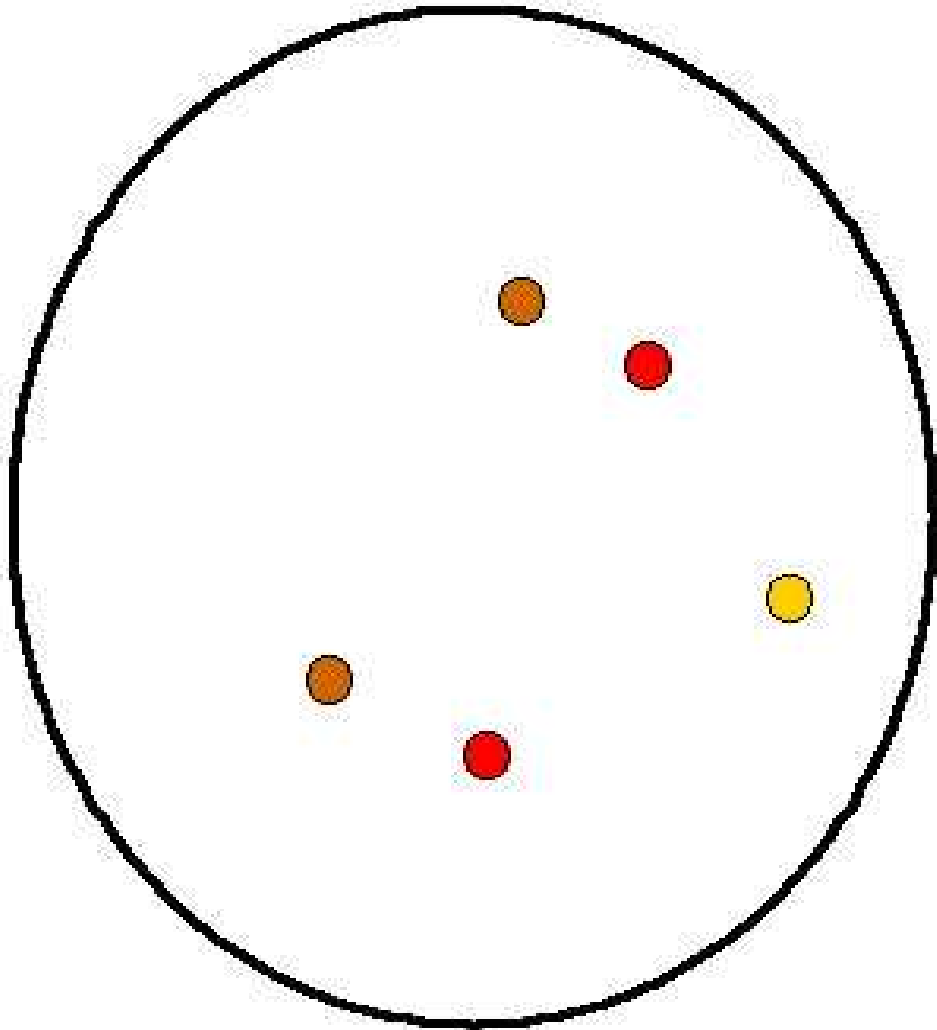


A population of bacteria.




Prescription: Treatment with an antibiotic

- No antibiotic resistance
- Low antibiotic resistance
- Moderate antibiotic resistance
- High antibiotic resistance

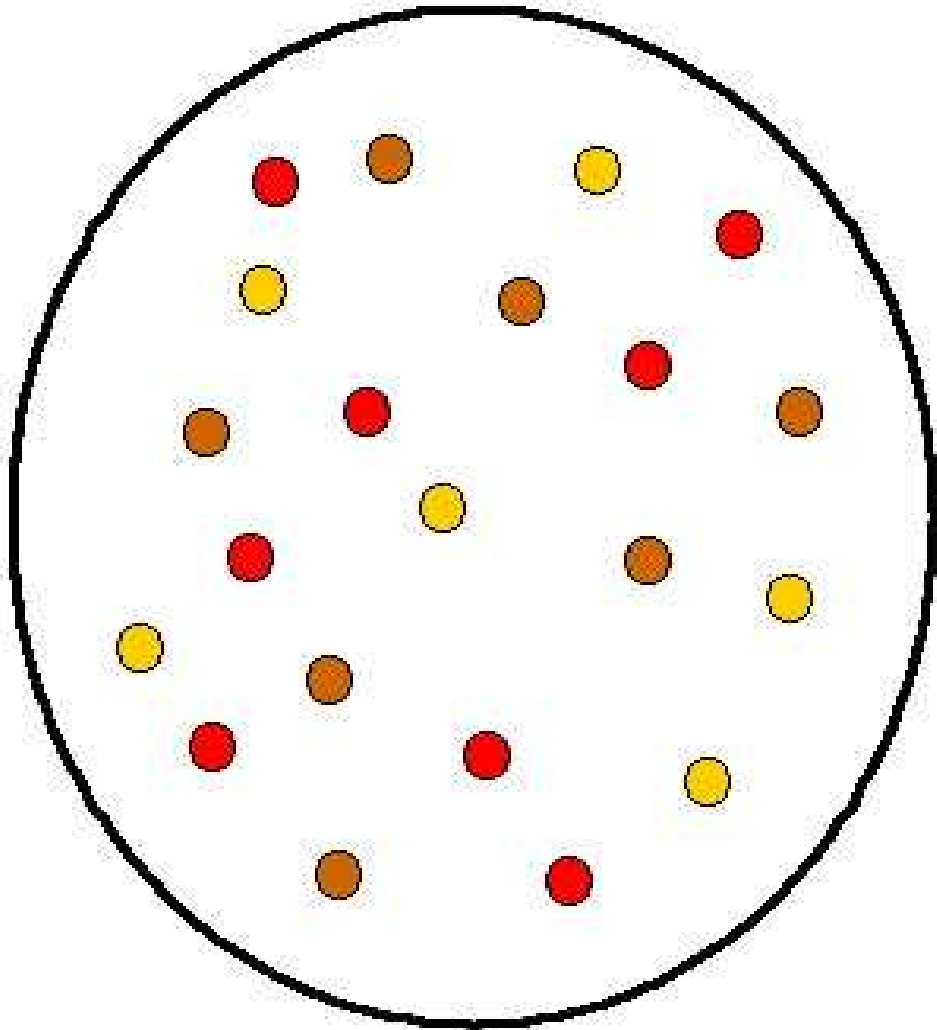
Antibiotic Resistance #2



A population of bacteria after first treatment with an antibiotic





-  No antibiotic resistance
-  Low antibiotic resistance
-  Moderate antibiotic resistance
-  High antibiotic resistance

Antibiotic Resistance #3

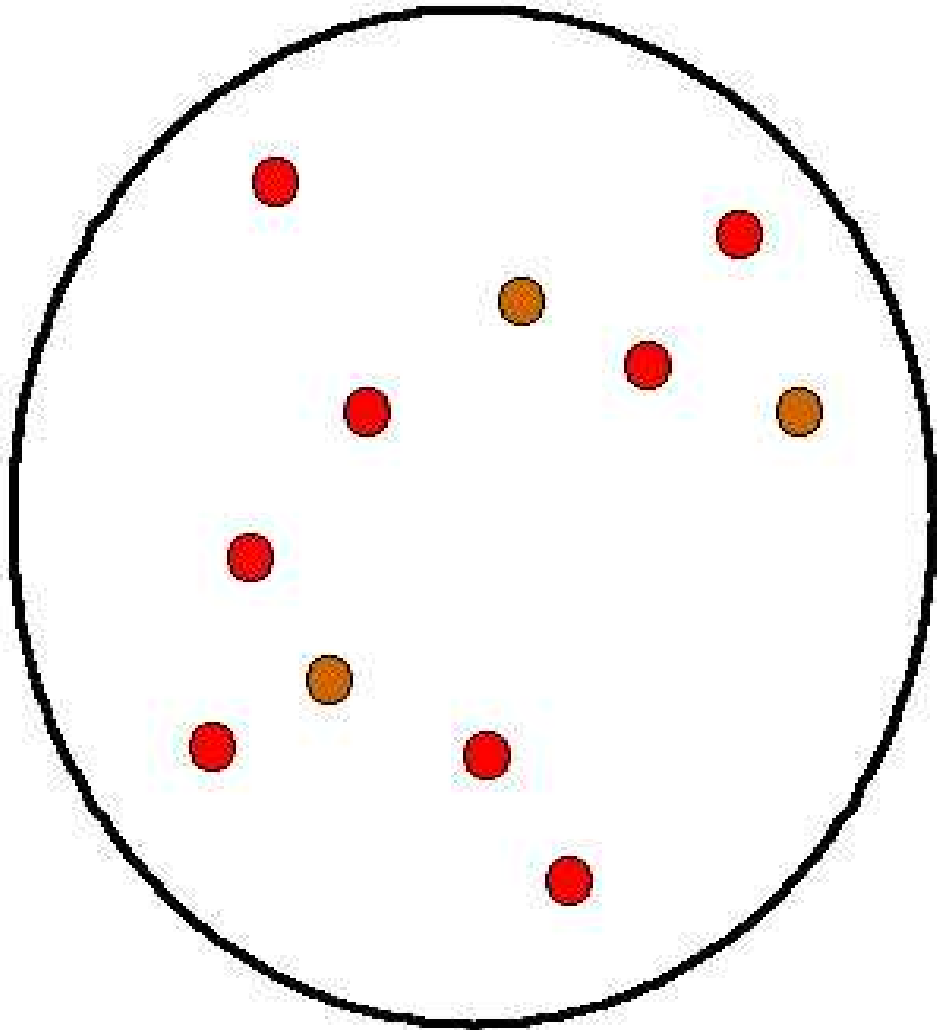


The population of bacteria recovers

Prescription: Antibiotic at a higher dose

-  No antibiotic resistance
-  Low antibiotic resistance
-  Moderate antibiotic resistance
-  High antibiotic resistance

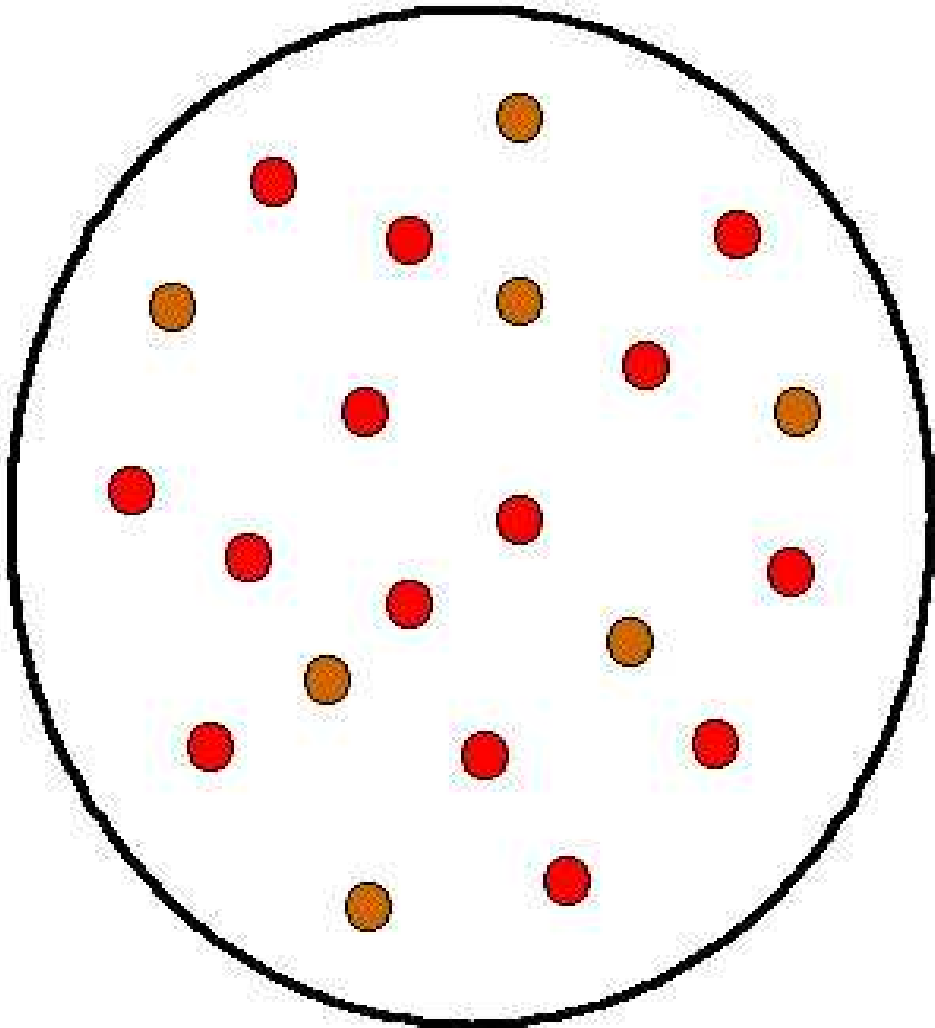
Antibiotic Resistance #4



The population of bacteria after a second course of the antibiotic

- No antibiotic resistance
- Low antibiotic resistance
- Moderate antibiotic resistance
- High antibiotic resistance

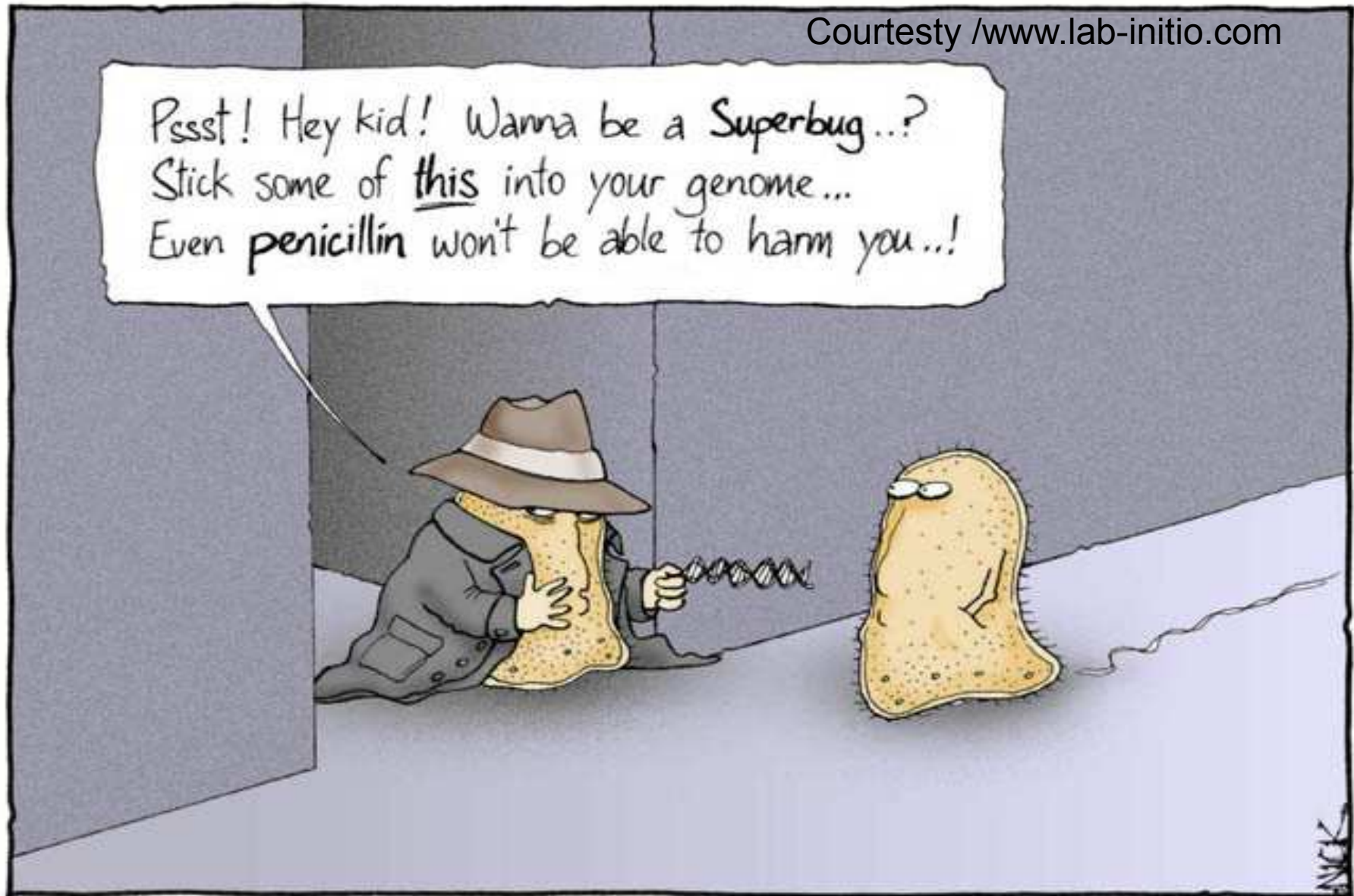
Antibiotic Resistance #5



The population of bacteria recovers

Prescription: A different antibiotic

- No antibiotic resistance
- Low antibiotic resistance
- Moderate antibiotic resistance
- High antibiotic resistance



It was on a short-cut through the hospital kitchens that Albert was first approached by a member of the Antibiotic Resistance.