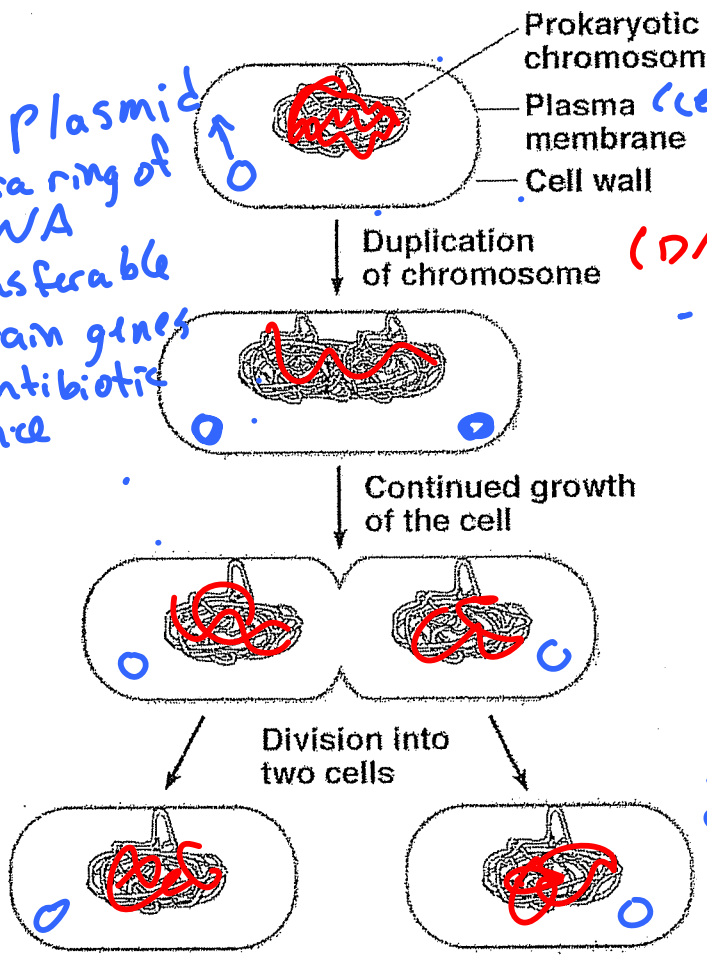
Reproduction in Bacteria

Asexual Method - Binary Fission

Bacteria reproduce asexually by a process termed _____. This process involves _____ parent and results in offspring _____ to the parent.



During binary fission.

(i) _____ is replicated. The bacterial cell's large circular _____ is copied. (The bacterial _____ is also copied if present)

(ii) Two identical chromosomes (& plasmids) align at the _____ of the cell, _____ and move to opposite ends of the cell.

(iii) The cell _____ and _____ identical daughter cells result.

This is the most common form of bacterial reproduction.

Advantages of Binary Fission:

(i) large number of offspring quickly

(ii) one individual can ensure survival of species

(iii) Because of their rapid reproduction, a population of bacteria can adapt quickly to their environment. A mutation that increases the fitness of the species will be passed relatively quickly through out the population.

Disadvantage:

Offspring are genetically identical to the parent cell and each other. A change in the environment could cause the demise of the entire population. ie. a virus is introduced

Sexual ~~Reproduction~~ – Conjugation: "come together" "Gene Transfer"

Bacteria reproduce sexually by a process termed conjugation. This process involves 2 parents and results in offspring different from the parents. ↳ modified bacteria

Conjugation involves the direct transfer of genetic material between two bacterial cells that are temporarily joined.

During conjugation,

(i) Two bacteria cells come into contact. A protein link (termed a sex pilus or conjugation tube) is formed between the two cells.

(ii) Part of the DNA (usually the plasmid) from one cell is copied and passed through the conjugation tube to the second cell.

(iii) The plasmid gets incorporated into the new cell's genome. The recipient cell now possess new combinations of genes, increasing diversity.

Note: The two cells involved in conjugation are generally of two different mating types. The donor cell carries the **F factor**. fertility

F factor: DNA segment (gene) that codes for the ability to form the conjugation tube

The F factor may be part of a plasmid or the bacterial chromosome.

Advantage of Conjugation: Genetic Diversity

The population is more likely to possess individuals who can survive a change in the environment.

Disadvantages:

(i) need a male (with F-factor)

(ii) doesn't increase the # of bacteria

Conjugation

Not susceptible

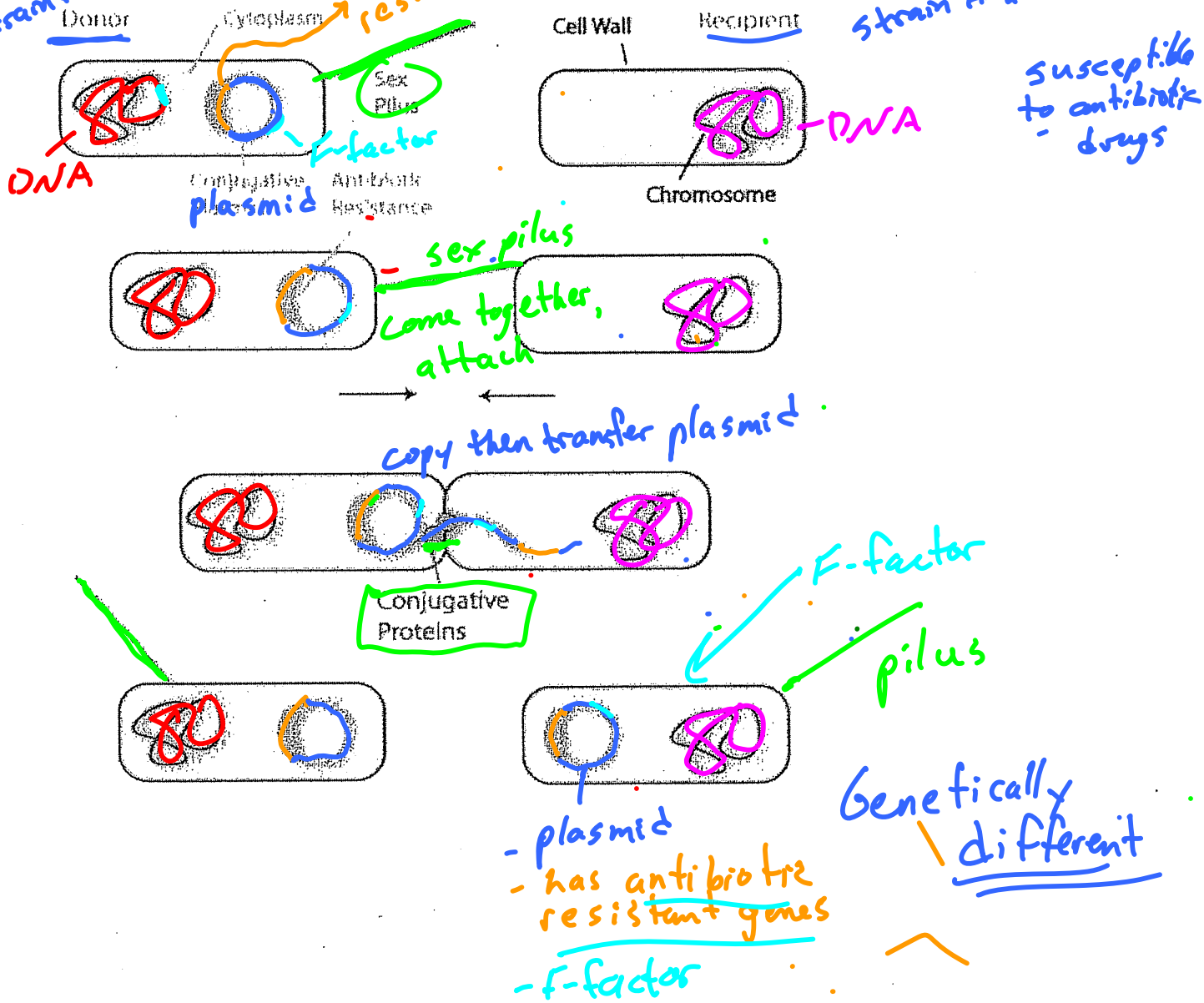
Strain #1 Has F-factor (F+)

antibiotic resistant gene

No F-factor (F-)

strain #2

susceptible to antibiotic drugs



- plasmid
- has antibiotic resistant genes
- F-factor

Genetically different