

Simulating phase variation-

We will: understand how mutations generate diversity.

We will: understand the effect mutation rate

We will: understand the role of mutation in disease.

Introduction

When you start the simulator you will begin with a single bacterial cell. This cell has **three** genes that can be switched **ON** or **OFF** (phase variable) by mutation.

The cells will begin to divide, and some of them will mutate at a given rate.

The cells will continue to divide until there are too many on the screen to continue growing.

In the simulator, each gene is represented by a number (I.E gene 1 is represented by the first number, gene 2 the second number and so on).

If a gene is switched on, its corresponding number will be 1, if it is switched off the number will be 0 (eg. if all 3 genes are turned on, the number will be 111)

Gene 1_Is a molecule that helps bacteria to stick to the host cells.

Gene 2_Is a surface receptor that allows the bacteria to take up nutrients.

Gene 3_Is a protein responsible for evading the immune effectors such as complement.

To cause disease, there must be at least 30 cells with all three genes switched on (111)