

## **Basic Terminology and Concepts**

There are some terms which will be commonly used to describe the protocols. Familiarity and understanding of these terms is key to comprehend the protocols.

- **Transformation:** The process in which the genetic makeup of a cell is changed by introduction of DNA from the surrounding environment.
- **Competent *E. coli*:** *E. coli* which can allow the uptake of DNA.
- **Heat Shock:** A sudden increase in temperature used to propel a plasmid into a bacterium.
- **Milli-Q:** Water that has been purified through successive steps of filtration and deionization. The standard used in our lab is typically 18.2M $\Omega$ -cm at 25°C, measured in resistance due to the lack of ions. The filters used are 0.22 $\mu$ m in size to ensure a high level of purity. This water is used for preparing our antibacterial stock to ensure purity.
- **LB (Lysogeny Broth):** a very standard and simple media to create due to its recipe consisting of 3 components - tryptone, yeast extract, and sodium chloride. This mix of anhydrous ingredients is added to water and then autoclaved, producing liquid media. The production of solid LB for plates is done by adding agar, a protein isolated from certain species of seaweed which coagulates the liquid into a gel-like form when cooled. This is done prior to autoclaving and is poured into the plates while still hot, where it will cool into the plate shape.
- **Aliquot:** An aliquot is a term to denote a certain quantity of something. In this case an aliquot of antibiotic stock would denote either 1mL or 0.5mL, depending on the antibiotic.
- **Antibiotic:** Compounds which inhibit bacterial growth. They act either bacteriostatically by preventing reproduction of the bacteria, or bacteriocidally where they directly kill the bacteria. Generally bacteriocides work by interfering with the synthesis of peptidoglycan in the bacteria's cell walls. Tetracycline is an example of a bacteriostatic, where it acts by binding to the ribosomes of prokaryotic bacteria and inhibits translation.
- **Autoclave:** A piece of equipment used for sterilization. The autoclave performs much like a pressure cooker: it subjects the contents inside it to a high temperature and high pressure steam bath. Usually the temperature is 121°C and at 15 lbs/in<sup>2</sup>, 20 minutes is enough to kill most microorganisms and render equipment sterile. When adding antibiotics to media, it is done after autoclaving so that the heat does not destroy the antibiotic activity.