Bacterial Transformation Analysis and DNA Profiling

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Reagents:

* DNA electrophoresis gel
* Electrophoresis chamber and power supply
* Simulated DNA profile printout
* Sample of victim’s DNA
* Samples of suspects’ DNA
* Allele frequency table (from lab manual)
* Hardy-Weinberg equation
* Bacterial culture plates (LB-, LB+, LB/amp-, LB/amp+)
* UV transilluminator

Summary:

In this experiment, we will investigate two important techniques used in molecular biology: DNA profiling and bacterial transformation. First, we will examine a simulated DNA profile provided by our instructor. Using DNA samples from a victim and crime scene evidence, we will identify the alleles present and determine which alleles may have come from the perpetrator. We will then use allele frequencies provided in the lab manual and apply the Hardy-Weinberg equation to calculate population frequencies, helping us evaluate the likelihood that a suspect matches the evidence. This analysis will help us identify the potential perpetrator and reflect on the implications and potential errors in DNA profiling.

In the second part of the lab, we will analyze bacterial transformation by examining four plates that were prepared in a previous session: LB-, LB+, LB/amp-, and LB/amp+. We will count bacterial colonies and observe growth patterns such as lawns or isolated colonies. By placing the plates under a UV transilluminator, we will identify which colonies successfully took in the plasmid that contains a fluorescent gene. This part of the experiment will help us understand gene expression, antibiotic resistance, and how DNA can be introduced into organisms like bacteria.