DNA Fingerprinting

Asma Akam

Lab Report #5

New York City College of Technology

**Abstract**

DNA fingerprinting is a method used to identify organisms and their connections and relationships to others. An electrophoresis machine is used to separate DNA fragments on agar, moving from negative to positive. DNA from a crime scene were collected and analyzed using the gel electrophoresis, by comparing the DNA fragment bands we evaluated which suspects were at the crime scene.

**Introduction**

DNA fingerprinting is an approach to determine and identify relationships and organisms. In order to examine collected DNA fragments a gel electrophoresis is used. A gel electrophoresis uses an electric field to size DNA with molecular weight, larger DNA move slower compared to smaller DNA fragments (Fang, Spisz, Wiltshire, D'Costa, Bankman, Reeves & Hoh, 1998). The agarose gel indicates specific parts of DNA from different samples, along side a DNA ladder to determine the size of the DNA. In crime scenes, fingerprints are collected by forensics to identify criminals and likely suspects. In this lab, we had to identify suspects in a crime scene based on there matching fragments of DNA.

**Methods**

In lab, we worked in groups of four to use an agarose gel to indicate fragments of DNA. In order to make the agarose gel 100ml TBE buffer with 1g agarose was mixed and microwaved for 30 seconds until clear. Then we add 5ul of SYBR safe and swirled it in. After we poured the solution in a gel tray and placed two combs into gel. Once the gel solidified we pulled out the comb to reveal wells and transferred the gel to the electrophoresis chamber. We loaded 20ul of each sample in designated wells, each tube should have 10ul DNA with 10ul of a restriction enzyme and 5ul of loading dye. The first well will have the DNA ladder, which will help indicate the size of the fragments, followed by the crime scene DNA and then the DNA of the suspects. We plugged in the correct wires and turn on the electrophoresis to 100V for 30 minutes. We observed the DNA under the trans illuminator.

**Results**

DNA fingerprints of suspects were collected in regard to a crime scene. Figure 1, illustrates the practicing of pipetting with specific measurements. Figure 2, illustrates two pictures of the agarose gel observed under a trans illuminator and a ruler to accurately compare the banding fragments of the DNA. The crime scene DNA was compared with the suspects to try to figure out who committed the crime.

**Discussion**

We observed the results of the DNA fragments as they moved from negative to positive. The ladder in the first well helps determine the size of the DNA fragments. The second well is the DNA of the crime scene as illustrating three bands that had been cut by the restriction enzyme. The first band seems to appear slighting early compared to the suspects already you can tell that the DNA fragments don’t exactly match. Suspect 4 illustrates more bands of DNA compared to the crime scene DNA. The last fragment of DNA for the crime scene is slightly off compared to the suspects. The nonmatching DNA fragments indicate that the suspects might not have committed the crime. If we had continued to keep the gel in the electrophoresis we might have seen more bands appear due to the restriction enzymes, and these bands might have demonstrated some band matching with the suspects. Due to limited time, the fragments we observed did not concluded a specific criminal based on the suspects fingerprints.

*Figure 1:*Practicing Pipetting

*Figure 2:* DNA fingerprinting on agarose gel

**Reference**

Fang, Spisz, Wiltshire, D'Costa, Bankman, Reeves and Hoh. Solid-State DNA Sizing by Atomic Force Microscopy, *Analytical Chemistry*. 1998 pg. 2123-2129