PCR Analysis

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BIO 1120 – Section 03

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Introduction

In this lab ,what we did is explore all the process of analysing human dna using different molecular biology techniques. Where we did in experiment is dna collection , extraction , amplification via pcr and visualization by gel electrophoresis

We start all by isolating dna from ours cheek cells as a sample , this experiment was to amplify a specific genetic maker called a vntr . these regions differ between indiviwal and can be used for genetic fingerprinting(Jeffreys,Wilson,&thein,1985).

Pcr is the main thing used in this lab report. It makes scientists to generate millions of copies of specific DNA segment frim a small sample (Mullis & Faloona, 1987).during amipfication , we ran the DNA through agarose gel electrophroresis to separatee freagments by size that to view genetic difference (lee et al.2012)

Overall , what we did is this experiment is used new tools for genetics , forensics and biotechnology .

Methods and material :

What we do is start by collecting cheek cell by a saline that mucus mouth have liquid . the liquid transferred into a microcentrifuge tube , and chelex liquid was add to lyse the cell and protect the dna .and what we did is put that mixture in high temperature and isolated purified DNA .

For this pcr we transfer 2 ul of our DNA into a pcr tube which has master mix . the thermal cycler was programmed to run :

* Denaturation : (94-96C)
* Aneeling (-68C)
* Elongation (72C)

After pcr, what we did is added loading dye to the sample and pipetted them into a pre made agarose gel. We run the gel into 120 volts for 45 minutes . A 1kb ladder was used to estimate the fragment sizes.

In this experimate accurate pipetting was important to every step to ensure realiable result and prevent error.

We wore gloves and sanitize our table where we work on .

Result: A black and white image of a dna strand

AI-generated content may be incorrect.

Fig: An image of DNA

After we complete gel eletrophoresis, we can see clear bands in above picture.

That is;

Sample 1&4 :single band , homozygous at the vntr locus

Sample 2&3: 2 band , heterozygosity

Positive : clear band

Negative: no band , error.

We used the ladder to estimate band size. Then to calculate the number by vntr :

VNTR repeats= (Total base pairs−145) /16

Let’s take example:

• Band at 285 bp: (285 - 145) / 16 = 8.75 near by 9 repeats

• Band at 205 bp: (205 - 145) / 16 = 3.75nearby 4 repeats

Discussion

This lab help to understand DNA analysis techniques. Using pcr we amplify the vntr region and view the result on gel which give us genetic variability. I saw my dna result looks kike homozygous at the locus whereas classmate with two bands is heterozygous.

The possititve and negative control was important this decide out reagent worked coreectly and that no error. I learned that even small error in pipetting or sample handling may take to fail in amplification or error.

This lab doesn’t have specific hypothesis, it successfully show core techniques in molecular biology. The application of VNTR analysis extends to field like forensics , paternity testing and genetic ancestry.

**Additional Background**

VNTRs are short DNA sequences that repeat multiple times and differ between individuals. Their high variability makes them ideal for identification purposes (Jeffreys et al., 1985). PCR allows for the exponential amplification of these regions, making analysis possible even from minimal DNA quantities (Mullis & Faloona, 1987). Gel electrophoresis then enables us to visualize and interpret these differences (Lee et al., 2012).

These methods, used together, form the foundation for DNA fingerprinting, a powerful tool in modern genetics.

References:

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