About KISSR

It is a public institution (based in Sulaimani city-Iraq) affiliated to the Ministry of Higher Education of the Kurdistan Region of Iraq (KRI).

Vision

Becoming a reliable Centre of Excellence for strategic studies to address national and global challenges.

Mission

1- Delivering cutting-edge research and strategic studies to find knowledge-based solutions to local, national, and global challenges and needs.

2- Fostering interdisciplinary research to tackle complex problems and drive innovation.

3- Producing reliable data and knowledge that can inform decision-making and empower communities, especially marginalized and underserved communities.

4- Building extensive networks and research collaborations, locally and internationally.

5- Developing high-quality research capacity building and consultation.

Field and Application

Agarose gel electrophoresis is used in fields such as biochemistry, molecular biology, genetics, and clinical chemistry. This method analyses PCR-generated fragments to confirm they match the expected size.

It is also used for purifying DNA fragments by running them on the gel, cutting out the band of interest, and extracting the DNA from the agarose medium.

Researchers can assess the concentration and yield of nucleic acid samples by comparing the brightness of the DNA bands against a standard for DNA quantification.

Gel Documentation System

Description

Agarose gel electrophoresis is a widespread laboratory technique that separates molecules such as DNA, RNA, and proteins depending on their size and charge. An electric current is supplied to wells at one end of a gel after the samples have been loaded. The molecules move faster or slower through the gel, allowing them to be separated from one another. Negatively charged DNA/RNA migrates through the pores of the gel towards the positively charged end when an electrical current is applied; smaller molecules move through the gel more quickly than larger molecules. The resulting bands can be seen with ultraviolet (UV) light using a specific dye (Ethidium Bromide) that bind to DNA and RNA.

Explanation of Result

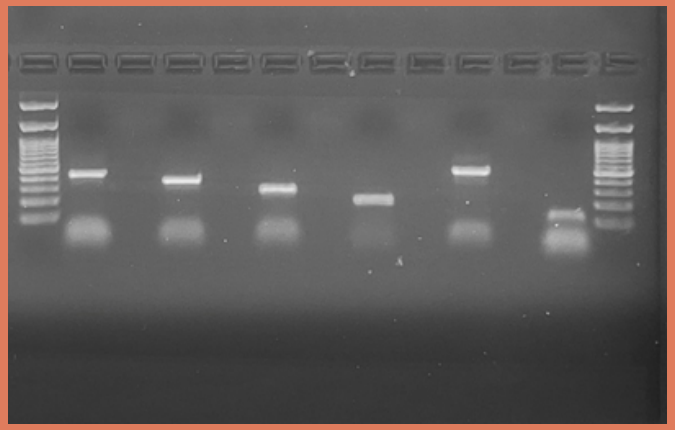
Strong bands: bright, intense bands suggest a high concentration of DNA/RNA fragments.

Faint bands: weak bands indicate a low concentration of DNA/RNA fragments.

Smearing: indicates degradation of the DNA/RNA.

Extra Bands: these could be due to contamination, non-specific binding, or incomplete digestion (if using restriction enzymes).

A



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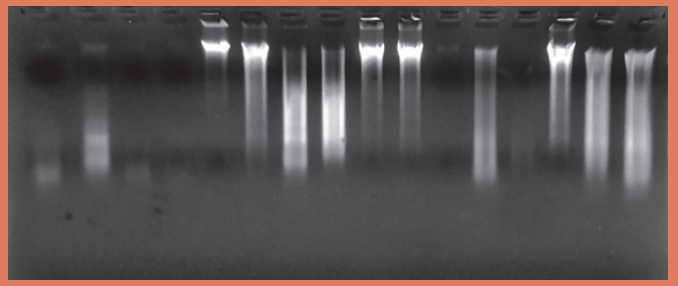

Result Explanation

(A) Agarose gel electrophoresis shows PCR products are generated from specific regions of human genomic DNA. DNA ladder, 100 base pairs (bp), is used to determine the size of the amplified PCR products.

(B) Agarose gel electrophoresis shows pig muscle tissue DNA. The DNA sample shows RNA as well as protein contamination. A faint and smeary RNA band below the genomic DNA is observed. The band stuck in every well could be because of protein contamination in the sample, which may cause the DNA to remain in the gel wells.

Sample Type

1- DNA samples: genomic DNA, plasmid DNA, PCR products, complementary DNA (cDNA), and DNA ladders.

2- RNA samples: total RNA and RNA ladders.

3- Oligonucleotides: short single-stranded DNA or RNA molecules, often used as primers or probes.

4- Control samples: positive controls and negative controls.

These samples are typically mixed with a loading dye before being loaded into the wells of the agarose gel. The loading dye contains a dense substance (like glycerol) to help the sample sink into the well and a tracking dye (like bromophenol blue or xylene cyanol) to monitor the progress of the electrophoresis.

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