eJBio

Electronic Journal of Biology, 2021, Vol. 17(4):194

PCR as a Diagnostic Tool for Muscle Disease

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Citation: Walker J. PCR as a Diagnostic Tool for Muscle Disease. Electronic J Biol, 17(4):194

Received: April 06**,** 2021; **Accepted:** April 20, 2021; **Published**: April 28, 2021

Editorial

Polymerase Chain Reaction (PCR) is a tool for making millions to billions of copies of a single DNA sample quickly, enabling scientists to take a small sample of DNA and amplify it to a large enough amount to analyze in depth [1]. The aim of PCR is usually to make enough of the target DNA region to be analyzed or used in another way. For example, PCR-amplified DNA can be sequenced, visualized with gel electrophoresis, or cloned into a plasmid for further research.PCR is used in molecular biology and many other fields in biology and medicine.

By amplifying either genomic DNA or cDNA derived from mRNA, the polymerase chain reaction (PCR) allows for the rapid delineation of mutations (deletions, point mutations, and others) due to its inherent high sensitivity and speed. PCR and direct DNA sequencing are an especially potent combination. We discovered a deletion in the dystrophin gene (which causes Duchenne or Becker muscular dystrophy) that spans four exons and causes a reading frame change in the dystrophin post [2]. For the combined amplification and cDNA sequence analysis, mRNA from embryonic myotubes was used.

The success of the polymerase chain reaction (PCR) as a sensitive method for identifying DNA or RNA sequences and detecting changes within genes is inextricably linked to the success of reverse genetics as a whole. This hypothesis is based on the idea that researching genes and genotypes rather than gene products or phenotypes is a better way to analyze biological properties of humans and other beings. Genetic studies that start at the level of DNA and work their way up to the phenotype are quickly gaining traction. That isn't to say that thorough study of gene products aren't necessary of them. However, it turns out that, in many cases, identifying a gene product using a gene or genome analysis method is simpler and easier — at least up to the level of its primary sequence.

Cloned DNA or RNA (the latter in the form of cDNA), genomic libraries with sorted overlapping clones, tissue specific cDNA collections, DNA sequencing, gene mapping, and linkage analyses are the main experimental tools that enable molecular studies of genes [3]. Linkage studies are particularly significant in medical and human genetic research because they point to disease genes that aren't well-known but are recognized indirectly by their clinical consequences.

PCR can be used for rapid study of mutations, gene activities, cloning, and mutagenesis, to name a few applications, as genes and genomic sequences become more well-known. One "member" of a new generation of molecular DNA methods may be the PCR. This method is likely to hasten the accumulation of new knowledge in basic and applied molecular biology.

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