

# Mutation Detection via CRISPRCas9 Micro-fluid Chip

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## ABSTRACT

In biology mutation is a change in the nucleotide sequences of the DNA of an organism mainly there are three types of mutation: point mutation, deletion and insertions. Once the mutation has been defined allele specific oligonucleotide hybridization, amplification, heteroduplex formation method referred to as a diagnostic method some advance technique like CRISPR cas9 system is using for selected mutagenesis. Using microfluid and CRISPR cas9 system we can detect a mutation. Let's say you have a DNA sample with fluorescently labeled from patient and you want to make sure that gene you are interested in is healthy gene. We can design a CRISPR to scan through DNA or find specific gene or mutation. The CRISPR scan the DNA if the CRISPR does not find targeted gene it does not bind to it its means that no fluorescence color appears under UV-light but its scan and find its target and this binding create a fluorescence signal its means that mutation can be occur in gene.

## MICROFLUID CRISPR CHIP PARTS

CRISPR micro fluid contains three main channels:

1. Sample loader
2. Mixture
3. Crispr block

### Sample Loader

Sample loader contain small hole in order to load your DNA sample

### Mixture

The mixture contains a zig zag design in order to move a sample from loader to Crispr Block

### Crispr Block

Crispr block contain a Cas9 protein and guide RNA.

## WORKING MECHANISM

1. Load a DNA sample
2. Moving a sample from loader to Crispr Block
3. Water bath or incubate 37°C for 20 min because of cas9 protein
4. Observe under UV light (Figures 1 & 2).

## RESULT AND OBSERVATION

As we know fluorescence are absorbed the UV-light and emitted color visible that we can see. When a DNA is completely bind with

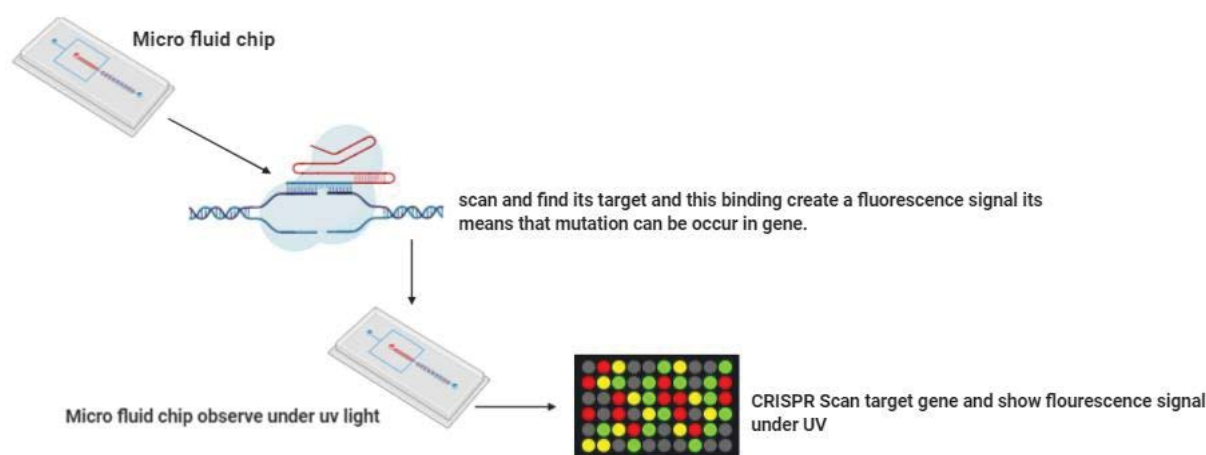


Figure 1: Working principal of CRISPRCas9 micro-fluid chip.

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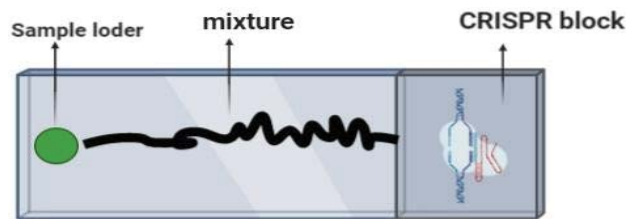


Figure 2: Microfluidic CRISPR chip parts.

cas9 protein which is going to be tested and emitting a high color fluorescence light its mean that there is mutation either single site or multiple site mutation [1-5].

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