



FORENSIK SCIENCE

Group....

Group Members:

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FORENSIC SCIENCE

A. Introduction

Question	Expected Answer
What do you know about Bioinformatics?	
What do you know about Forensic Science?	
What are the roles of Forensic Science in everyday life?	
How important is Bioinformatics in helping Forensic Science?	
What are the stages of Bioinformatics in solving Forensic Science problems?	
What are the tools used in Forensic Science	
Is there a connection between Forensic Science and Genetics?	

Now, let's watch a video on Forensic Science and DNA Fingerprinting.

a). Forensic

<https://youtu.be/i7Lg0dUDzxk>



b). DNA Fingerprinting

<https://www.youtube.com/watch?v=7onjVBsQwQ8>



After watching the two videos above, give us your comments and thoughts!

B. Investigations

On March 4, 2023, there was a major fire at **Pertamina Pelumpang Depo** in North Jakarta, Indonesia. The fire was caused by a leak in the Pertamina gasoline pipeline object. A total of 33 victims were identified. Conventional identification methods left 6 victims unidentified. From the accident site, there are 6 victims who have not been identified and only fragments of the victim's bones remain. To identify them, they were sent to the Laboratory of Molecular Biology, then samples were taken from the victim's family or DNA left on the victim's toothbrush or hair. In this case, mtDNA and STR profiles were used to assist the genetic investigation

Modified from Article: Korban Jiwa Kebakaran Depo Pertamina Pelumpang Bertambah. (2023). <https://bit.ly/KebakaranPertaminaPelumpang>

The following is the victim's DNA (**Sample A**) which will be aligned with the DNA of the next of kin or the DNA left on the victim's toothbrush or hair (**Sample B**).

Sample A

>A1

CGCAGAAGCTGCTCGTGTCAAATTAAGAGAAACGCACTGATGTTAAGCAT

>A2

CACACCCGCGGTGACTTGACATGCGATTGCTCCCTAAGGTCTATCTCC

>A3

GAGCAAGTACAGCAAGTGTGGTCGCAAGGACCTACCCCGCGTATCGGCA

>A4

CACACCCGCGGTGACTTGACATGCGATTGCTCCCTAAGGTCTATCTCC

>A5

ATGGGGGAAGGAACCGCCAGGCCAACGGTTTTTCGGTGAGTTCACATTG

>A6

TCGGTGACAAACCCAGACTTCATCGTACGACCATTTTGAGTTGCAGAAGC

>A7

TTACCTAGCCGATCAGCATGAGAACGGGAAAATAGCCCACGGAGGCTACT

Question, from the DNA samples presented, is there the same DNA?

Sample B

>B1

CACACCCGCGGTGACTTGACATGCGATTGCTCCCTAAGGTCTATCTCC

>B2

CGCAGAAGCTGCTCGTGTCAAATTAAGAGAAACGCACTGATGTTAAGCAT

>B3

AGCCAAGTACAGCAAGTGTGGTCGCAAGGACCTACCCCCGCGTATCGGAG

>B4

TCGGTGACAAACCCAGACTTCATCGTACGACCATTTTGAGTTGCAGAAAT

>B5

TTACCTAGCCGATCAGCATGAGAACGGGAAAATAGCCCACGGAGGCTACT

>B6

ACACAGGAAGGAACCGCCAGGCCAACGGTTTTTCGGTGAGTTCAACCTG

1.Using Sequences Manipulation Suite (SMS)

a. Access the following link

https://www.bioinformatics.org/sms2/color_align_prop.html

SMS

Formal Conversion
 Genbank to FASTA
 EMBL to FASTA
 EMBL Feature Extractor
 Fasta to Genbank
 Genbank to FASTA
 Genbank Feature Extractor
 Genbank Trans Extractor
 One to Three
 Range Extractor (DNA)
 Range Extractor Protein
 Reverse Complement
 Split Coding
 Split FASTA
 Three to One
 Window Extractor DNA
 Window Extractor Protein

Sequence Analysis
 Clustal W
 Custom Usage
 GUID Aligner
 Quick Molecular Weight
 Quick Pattern Find
 Quick Stats
 Lazy Search Disk
 Lazy Search Web
 Ident and Dist
 Multi Seq. Props
 Motifs for Digest
 ORF Finder
 Patterns Align Colors
 Patterns Align DNA
 Patterns Align Protein
 PCR Primer Sites
 PCR Products
 Protein Shaker
 Protein Sweeping Page
 Protein Molecular Weight
 Protein Pattern Find
 Protein Stats
 Restriction Digest
 Restriction Summary
 Reverse Translate
 Translate

Sequence Figures
 Color Logo Construction

Sequence Manipulation Suite:

Color Align Properties

Color Align Properties accepts a group of aligned sequences (in FASTA or GDE format) and colors the alignment. The program examines each residue and compares it to the other residues in the same column. Residues that are identical or similar among the sequences are given a colored background. The color is chosen according to the biochemical properties of the residue. You can specify the percentage of residues that must be identical and similar for the coloring to be applied. Use Color Align Properties to highlight protein regions with conserved biochemical properties.

Pass the **aligned sequences** in FASTA or GDE format into the text area below. Input limit is 200,000,000 characters.

- Show residues per line.
- Percentage of sequences that must agree for identity or similarity coloring to be added:
- Used colored ☐ backgrounds ☒.

Enter the starting positions of the sequences separated by commas (to alter residue numbering). An example entry is: **0,200,0,-1**. If no numbers are given, the default starting position of 0 is used for each sequence.

*This page requires JavaScript. See browser compatibility.
 *You can mirror this page or use it off-line.

[new window](#) | [home](#) | [citation](#)

Please analyze the aligned DNA!

After you have solved the Forensic Science problem above, look for another case to find a solution using the bioinformatics methods you have learned.



Please answer the questions below again

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What do you know about Bioinformatics?	
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What are the tools used in Forensic Science	
Is there a connection between Forensic Science and Genetics?	

Let's look at your answers after doing the activities in this lesson. If your answers change, become more detailed and better than before, congratulations! Your understanding is improving. However, if your answers after these activities remain the same, don't worry, please study again and consult your teacher.