

# Manipulate Biological Data Using Biostrings Package Exercises (Part 2)



Bioinformatics is an amalgamation of Biology and Computer science. Biological Data is manipulated using Computers and Computer software's in Bioinformatics. Biological Data includes DNA; RNA & Proteins. DNA & RNA is made of Nucleotide which are our genetic material in which we are coded. Our Structure and Functions are done by protein, which are built of Amino acids

In this exercise we try to correlate the relation between DNA, RNA & Protein.

Conversion of DNA to RNA is known as Transcription. DNA/RNA to protein is known as Translation.

Here we also discuss Sequence Alignment Techniques. Sequence Alignment is comparing the similarity between the sequences to check how much the DNA, RNA or Protein are related to each other.

There are three types of Sequence Alignment

1. Global Alignment
2. Local Alignment
3. Overlap Alignment

In the exercises below we cover how we can Manipulate Biological Data using Biostrings package in Bioconductor.

Install Packages  
Biostrings

Answers to the exercises are available [here](#).

If you obtained a different (correct) answer than those listed on the solutions page, please feel free to post your answer as a comment on that page.

### **Exercise 1**

Create a DNA String and find out the complement of the DNA

### **Exercise 2**

Create a RNA String and find out the complement of the RNA

### **Exercise 3**

Create a DNA string and find the reverse complement of the same.

### **Exercise 4**

Create a RNA string and find the reverse complement of the same.

### **Exercise 5**

Create a DNA string and translate the same into Amino Acids using Standard Genetic codon and print the three letter codon of the amino acids

### **Exercise 6**

Create a DNA string and translate the same into Amino Acids using Standard Genetic codon and print the three letter codon of the amino acids

### **Exercise 7**

Create two DNA Strings and align the sequence using Global Alignment technique and print the score of the alignment

### **Exercise 8**

Create two DNA Strings and align the sequence using Global

Alignment technique and print the score of the alignment after specifying your own score for match and mismatch among the sequence

### **Exercise 9**

Create two DNA Strings and align the sequence using Local Alignment technique and print the score of the alignment

### **Exercise 10**

Create two DNA Strings and align the sequence using Overlap Alignment technique and print the score of the alignment