Practical 4
26 Feb 2024

Questions

1. a. Write a program to construct a dot plot for the alignment of human and chicken hemoglobin β chain. Identify the segments, which are same in both sequences.

   b. Construct the dot plot manually for the residues 1-20 and verify with the plot obtained using program

2. Calculate the score for the following alignments **using code**:

   ```
   AATCTATA
   AAG--ATA
   ```

   Assume that the match score is 1, mismatch score is 0, origination penalty is -2, and length penalty is -1.

3. Verify the Q2 **manually**

4. Using the Needleman and Wunsch dynamic programming method, construct the partial alignment score table and align the following two sequences (**using code**):

   ACAGTCGAACG and ACCGTCCG

   use the scoring parameters: match score: +2; mismatch score: -1 and
   gap penalty: -2

5. Verify Q4 **manually**

6. Using the Smith-Waterman method, construct the partial alignment scoring table and align the following two sequences (**using code**):

   ACGTATCGCGTATA and GATGCGTATCG

   scoring parameters: match score: +2; mismatch score: -1 and gap penalty: -2

Deadline: 10 Mar 2024