

DNA Strider

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Introduction

Back in the heyday of Molecular Biology, before the internet became prevalent and just after restriction endonucleases became commercially available, there was a popular computer program which could be found on just about every molecular biologist's computer. This program was called "DNA Strider." DNA strider was designed to analyze DNA sequences. It could perform many important functions, including: identify restriction endonuclease sites, locate open reading frames, and translate DNA sequence to protein sequence. In this event, teams will be performing these three basic tasks. Teams will be given a single strand DNA sequence that is 2000 base pairs in length. The nucleotide residues will be numbered. From this sequence students are expected to identify open reading frames, translate these open reading frames into a protein sequence, and identify restriction endonuclease sites. For this event, students will be doing the analysis, a computer with DNA strider cannot be used. To summarize, teams should be prepared to do the following tasks.

Task I:

Identify restriction endonuclease sites. The restriction endonuclease sites to be identified will be drawn from the following list: EcoRI, BamHI, HindIII, NotI, TaqI, SmaI, AluI, Eco RV, KpnI, PstI, SacI, SalI, ScaI, and XbaI.

Task II:

Identify open reading frames. From this open reading frame, students should be able to translate the open reading frame into a protein sequence and report this sequence using the single letter abbreviations for each amino acid.

Event Limitations

Teams cannot use any reference materials. Teams cannot use any electronic devices. Participants should bring only a pen or pencil into this event.

On The Day of the Meet

Each team will be given four copies of the DNA sequence and one answer sheet. The DNA sequence will be single stranded and organized into groups of 10 for easy counting. Each team will also receive three questions concerning this sequence. The first two questions will focus on Task I and are worth 10 points each. The third question will focus on Task II and will be worth 20 points.

Scoring the Event

Points will be given according to the answer for each question. The point scale will be based on the accuracy and correctness of each team's answer. It is expected that some teams will receive a perfect score. In this case, the team which completes the event in the shortest time will be awarded first place. Additionally, all ties will be broken using the shortest time to determine the higher rank.

Addendum

Should anyone be interested in learning more about DNA Strider, this program is available as freeware from the website: <http://cellbiol.com/soft.htm>. Although, be warned, this program is old, so old it only runs on Mac Classic background.....