

Name _____ Lab (day) _____

1. (each 1 point) Circle TRUE or FALSE:

- | | | |
|------------------------------------------------------|------|-------|
| a. Agarose gels are vertical | TRUE | FALSE |
| b. DNA migrates towards + (positive electrode) | TRUE | FALSE |
| c. You can load your DNA samples without loading dye | TRUE | FALSE |
| d. DNA gels are submerged in water | TRUE | FALSE |
| e. Smaller DNA molecules will migrate faster | TRUE | FALSE |

2. (3 points) What are the dyes bromphenol blue and xylene cyanol used for?
To track the migration/progression of your DNA on the gel.

3. (3 points) Which two features of the molecules used in DNA sequencing (ddNTP) make them useful for this application?

- 1) Missing OH groups (de-deoxyNTP) result in chain termination when they are incorporated
- 2) they are coupled to a fluorescent dye/they have a fluorescent label

4. (3 points) How would you expect the sequencing reaction to be affected if you forgot to add any ddNTPs in your reaction mix?

DNA chain elongation will not terminate at random positions. You will not get any sequence information.

5. (6 points) You do a BLASTN search with your sequence (600 bp long) and get the following result. Do you think this is a significant hit? Explain your answer.

```
> gi|109698613|gb|CP000388.1 D Pseudoalteromonas atlantica T6c, complete genome
Length=5187005

Features in this part of subject sequence:
  phosphohistidine phosphatase, SixA

Score = 44.1 bits (22), Expect = 0.61
Identities = 22/22 (100%), Gaps = 0/22 (0%)
Strand=Plus/Plus

Query  444      CATAGCCAAACTGTATCAAATG  465
      |||
Sbjct  1993215  CATAGCCAAACTGTATCAAATG  1993236
```

No, it is not. Although the match is perfect, 100% identity, the probability of this match occurring at random is high, the E value/Expect/P(N) value is high. This is likely due to the fact that the alignment is very short; only a small part of your sequence aligns with the subject.