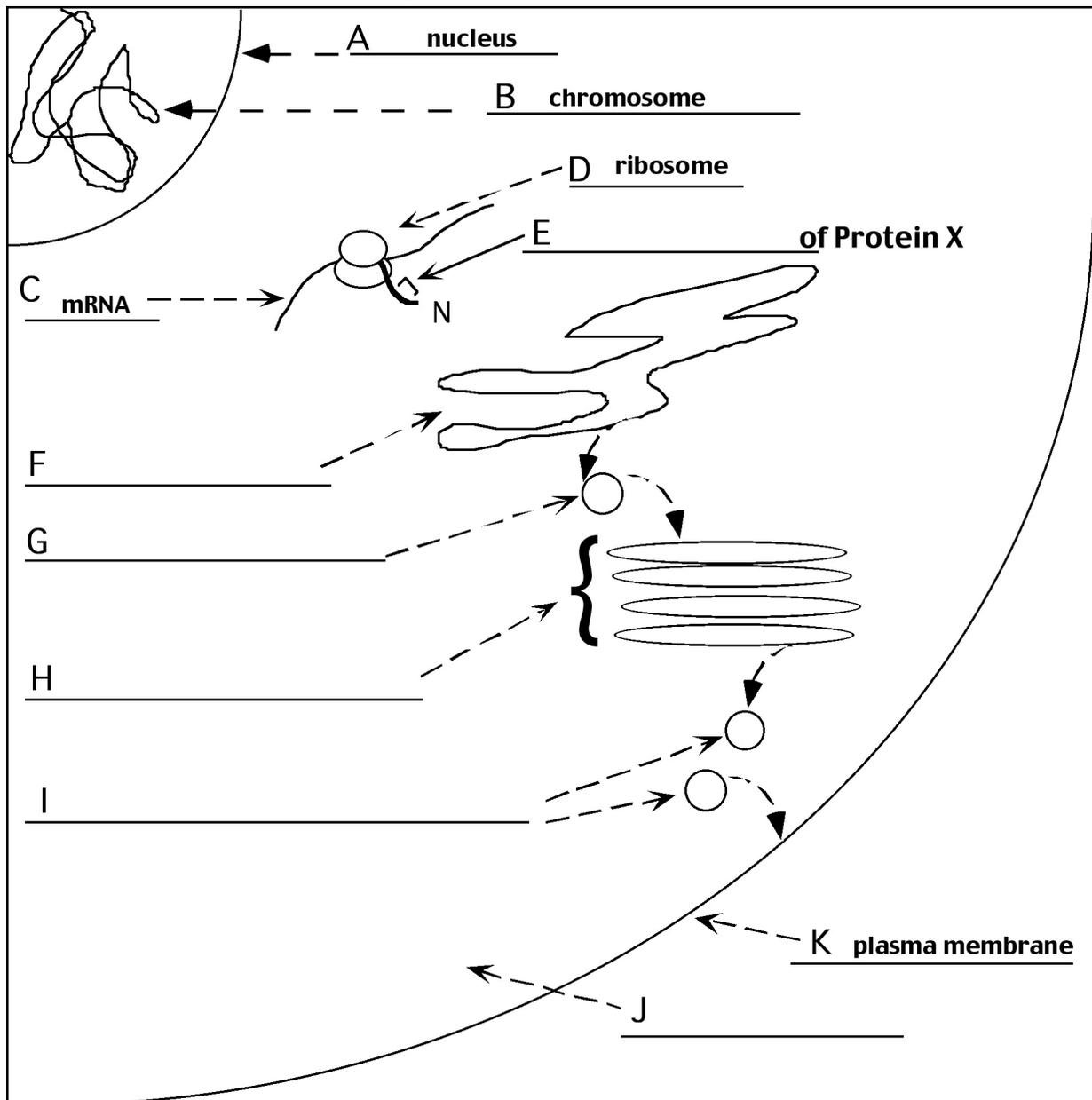


7.013 SECTION PROBLEM**PROTEIN SECRETION AND LOCALIZATION**

The following 4 proteins are found in a yeast cell.

- | | |
|-----------|------------------------------|
| Protein 1 | is a cytoplasmic protein |
| Protein 2 | is a secreted protein |
| Protein 3 | is a secreted protein |
| Protein 4 | is a plasma membrane protein |

Describe how each of the following mutations (a-f) affect the localization of these above proteins.

- | | |
|-----------------------|------------------------|
| outside the cell | in the golgi |
| in the cytoplasm | in the ER |
| in transport vesicles | in the plasma membrane |
| in secretory vesicles | in the nucleus |

Fill in the blanks below with the term(s) from the previous list to indicate the resulting locations of the proteins.

- a) Mutation A is a deletion of the signal sequence protein 2. Where would the majority of the following proteins be found in a strain with this mutation?

Protein 1?

Protein 2?

Protein 3?

Protein 4?

- b) Mutation B inactivates the SRP (signal recognition particle), preventing it from binding to signal sequences. Where would the majority of the proteins be in a strain with this mutation?

Protein 1?

Protein 2?

Protein 3?

Protein 4?

- c) Mutation C results in a deletion of the transmembrane domain of protein 4. Where would the majority of the following proteins be found in a strain with this mutation?

Protein 1?

Protein 2?

Protein 3?

Protein 4?

- d) Mutation D blocks the fusion of the transport protein vesicles with the Golgi membrane. Where would the majority of the following proteins be found in a strain with this mutation?

Protein 1?

Protein 2?

Protein 3?

Protein 4?

- e) Mutation E eliminates the SRP docking protein on the ER membrane. Where would the majority of the following proteins be found in a strain with this mutation?

Protein 1?

Protein 2?

Protein 3?

Protein 4?

- f) Mutation F inserts a signal sequence in frame at the beginning of Protein 1. Where would the majority of the following proteins be found in a strain with this mutation?

Protein 1?

Protein 2?

Protein 3?

Protein 4?