Bio121
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Review Questions
Lectures 8 and 9

1. What is the 5' cap and what are its functions?

2. What is the poly-A tail and what are its functions? How is the poly-A tail formed? Why is it stated that the "poly-A tail is not encoded in the genome?"

3. What are the potential consequences of an alternative poly-A site being selected in an nRNA? What is a real life example of alternative poly-A site selection?

4. Does mRNA have introns?

5. What process removes introns? What is the name of the cellular machinery responsible for splicing and what is it composed of?

6. What is meant by "alternative splicing"? What does this mechanism allow for?

7. Alternative splice sites can produce different gene products called _____.

8. What are splicing enhancers and recognition factors? (Especially important to understand how cell-type specific recognition factors leads to expression of cell-type specific splicing isoforms)

9. What could happen if two different cells expressed different splicing factors?

10. What is one way that alternative splicing can lead to the evolution of new proteins?

11. What type of RNA is selectively degraded in the nucleus? What type of RNA is selectively degraded in the cytosol?

12. Why is nonsense mediated decay an important cellular mechanism?

13. What are exonucleases and endonucleases? How are they different?

14. How does the 5' UTR influence translation initiation?

15. What is an IRES? (Define the acronym *and* explain what it is.) What factors contribute to an IRES being used?

16. What RNA modifications contribute to mRNA stability?

17. How does prolactin influence casein?

18. What are miRNAs? What mechanisms do they use to prevent translation?

19. How are miRNAs produced? What are the key players in producing miRNA?

20. If a protein is folding in an aqueous environment, would the polar side chains face out, or be hidden within the protein core? What about non-polar side chains? Why?

21. What is the function of molecular chaperones? What would happen to a cell in the absence of these proteins?

22. What is the mechanism of Hsp60? And Hsp70?

23. What is the function of calnexin and calreticulum? How are these chaperones different from Hsp60 and Hsp70?

24. Do correctly folded proteins need chaperones? What happens to misfolded proteins?

25. What is the proteasome?

26. Are transmembrane proteins inserted into the membrane while they are being translated or after they are translated?

27. What is the name of the ER protein that aids in membrane insertion?

28. What is a start-stop signal sequence? What protein recognizes these sequences? What would happen if a potential transmembrane protein had mutations in the start-stop signal sequence that prevented it from being recognized?

29. Describe the different types of covalent modification discussed in this lecture. Are these ever reversible? How can these modifications influence cell specificity?

30. What is a polymer? Give an example of a protein polymer.

31. What is a proteolytic modification? Is it reversible? What is an example of proteolytic modification?