Terms & Guide Questions for Topic: Translational Regulation

Terms

Translational repressor
Ferritin, iron response element (IRE), & iron response protein (IRP)
microRNA (miRNA) & RISC
eIF2 & the eIF2 kinases
Growth factors
eIF4E & 4E-BP (eIF4E-binding protein)
eIF2B

Guide Questions

1. As discussed in the Video Lecture, IRP (Iron Response Protein) regulates translation of ferritin mRNA by binding to its 5' UTR, but does not regulate translation of other mRNAs. What is responsible for this specificity?

2. How does binding of IRP to the ferritin mRNA 5' UTR inhibit its translation?

3. Which of the following mutations would you predict to cause ferritin translation in cells independent of iron levels?

4. How do microRNAs (miRNAs) repress translation proteins?

5. miR-21 is a microRNA that represses translation of the protein MYCBP. What causes miR-21 to repress translation of MYCBP specifically, as opposed to other proteins?

6. The statement "global translation is inhibited in cells" means that _____.

7. Why does inhibition of eIF2 result in inhibition of global translation in cells?

8. The Video Lecture discusses the four proteins HRI, PKR, PERK, and GCN2. What do these proteins have in common? How do they differ?

9. When active, the protein 4E-BP inhibits global translation. How does 4E-BP inhibit global translation?

10. Growth factors promote global translation by inducing _____ of 4E-BP, which causes 4E-BP to _____ and enables _____.

11. How does phosphorylation of eIF2B affect global translation?