Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_

**DNA,** **Hot** **Pockets,** **&** **The** **Longest** **Word** **Ever** Crash Course Biology #11

1. What is the nickname and function of the longest known protein on earth?

2. During \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the DNA instructions are copied gene by gene and taken out of the nucleus.

3. During \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, amino acids are assembled into strings of polypeptides, or proteins.

4. Most of the polypeptides that get made are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which go on to make cell material.

**Transcription**

5. The length of DNA that is going to be transcribed onto an RNA molecule is called our \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

6. Each transcription unit has a sequence ‘upstream’ on the strand called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which marks the beginning of the transcription unit.

7. What are the four nitrogenous bases?

8. T-A-T-A-A-A-A is the sequence that makes the nearly universal promoter known as the \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_.

9. In this case, upstream means toward the \_\_\_\_ end and downstream means toward the \_\_\_\_ end.

10. The first enzyme in the process is \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which copies the DNA sequence downstream of the TATA Box.

11. RNA polymerase works toward the 5’ end and copies the DNA into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_.

12. Where does the initial RNA polymerase enzyme in a cell come from?

13. RNA has the base \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and not \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

14. The RNA polymerase is triggered to pull off when it reaches a downstream sequence called a

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

15. A special type of guanine is added to the 5’ end, called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

16. About 250 adenines are added to the 3’ end, called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

17. The caps on either end of the mRNA package make it easier for the mRNA to leave the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and protect it from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from nearby passing enzymes, while also making it easier to connect with other organelles later on.

**RNA Splicing**

18. RNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cuts out ‘extra information.’

19. The snRNPs (\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ribonucleoproteins) are a combination of RNA and proteins that recognize the sequences that signal the start and end of the areas to be spliced.

20. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ breaks down the bases that are being cut out and joins the ends

of the remaining segments.

21. The sections of mRNA that will eventually be expressed are called \_\_\_\_\_\_\_\_\_\_\_\_\_.

22. The sections of mRNA that are spliced out are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Translation**

23. The organelles where proteins are synthesized are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which are made up of protein and ribosomal RNA, or rRNA.

24. Ribosomes have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ that allow the incoming mRNA to interact with

transfer RNA, or \_\_\_\_\_\_\_\_\_\_\_\_.

25. On one end of the tRNA is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_. On the other end is a specific sequence

of \_\_\_\_\_\_\_\_\_\_ nitrogenous bases.

26. How many amino acids do humans have in their bodies?

27. The mRNA is read three letters at a time - each set called a triplet \_\_\_\_\_\_\_\_\_\_\_\_\_.

28. The complementary end of the tRNA is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

29. The tRNA also brings an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.

30. For almost every gene, the first codon on the mRNA is \_\_\_\_\_\_. The matching tRNA anticodon UAC

has the amino acid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on its other end.

31. If the mRNA codon is UUA, then the matching tRNA anticodon is \_\_\_\_\_\_\_\_\_. If the codon is AGA, then the anticodon is \_\_\_\_\_\_\_\_\_.

32. Connecting amino acids forms a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_, which is the beginning of a protein.

33. Multiple codons may code for the same amino acid. Why might that be considered positive?

**Folding and Protein Structure**

34. The actual sequence of amino acids in a polypeptide is called its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ structure.

35. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds give polypeptides their secondary structure, which may include spirals,

called a \_\_\_\_\_\_\_\_\_\_\_\_\_ or pleated \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

36. R groups define each amino acid and their interactions cause additional bending to the

polypeptide chain, giving a protein its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ structure.

a. Some R groups are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and they will draw together.

b. Other R groups are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and they will tend to form hydrogen bonds together.

37. Several different polypeptide chains coming together form a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ structure. 38. What are some functions of completed polypeptides?