

Transcription Factor Course Project

Transcription factors are proteins that regulate the transcription of DNA to RNA. They can do this in several different ways, but the most common mechanisms include stabilizing or blocking binding of RNA polymerase to DNA, recruiting coactivator or corepressor proteins to the transcription factor/DNA complex, or altering the accessibility of DNA to transcription by modifying the histones.

Assignment #1: On September 15, we will be discussing transcription in class, and you will each give a 3-4 minute presentation on a particular differentially regulated (i.e. one that isn't always on) transcription factor. Your presentation should include:

--whether the transcription factor is involved in basal or differentially regulated transcription of genes; if it is regulated, what it responds to

--how the transcription factor interacts with DNA

You should prepare a Powerpoint presentation to present your information. You should include at least three literature references: one review, one on its regulation, and one on its DNA-protein interactions. You may use

You may NOT use one of the examples we talk about in class (gal4 or GCN4), but here are some others to consider:

--Estrogen receptor, HOX proteins, NFkappaB, AP-1, STAT family members, Fos/Jun, and myc.

You are welcome to choose something not on this list, but please consult with me.

Final Project:

You will write a Proteopedia page about the transcription factor you chose for the first assignment. Your page should integrate the information from your class presentation, and clearly describe and show how the transcription factor interacts with DNA. Your page should contain a minimum of five scenes, and the images should match the words. The relevant details should be clearly labeled and easy to see.

Rough drafts are due on October 6. The class period will be reserved for getting help from your peers and from me on your project. You will present your final Proteopedia page to the class on October 13.

Page/Protein: _____

Write a few sentences (1-3) that summarize the function of the protein in the cell, its regulation and how it interacts with DNA.

| | | | | | |
|---|-----------|---|---|---|------|
| Rate the page overall.... | Excellent | | | | Poor |
| The readability of the text—does it make sense? | 5 | 4 | 3 | 2 | 1 |
| The connections between the text and the images | 5 | 4 | 3 | 2 | 1 |
| Suggestions for the page overall? | | | | | |

Scene 1: _____

| | | | | | |
|---|---|---|---|---|---|
| Clearly demonstrates what the words say | 5 | 4 | 3 | 2 | 1 |
| Uses color, representations, and labels effectively | 5 | 4 | 3 | 2 | 1 |
| How could this scene be improved? | | | | | |

Scene 2: _____

| | | | | | |
|---|---|---|---|---|---|
| Clearly demonstrates what the words say | 5 | 4 | 3 | 2 | 1 |
| Uses color, representations, and labels effectively | 5 | 4 | 3 | 2 | 1 |
| How could this scene be improved? | | | | | |

Scene 3: _____

| | | | | | |
|---|---|---|---|---|---|
| Clearly demonstrates what the words say | 5 | 4 | 3 | 2 | 1 |
| Uses color, representations, and labels effectively | 5 | 4 | 3 | 2 | 1 |
| How could this scene be improved? | | | | | |

Scene 4: _____

| | | | | | |
|---|---|---|---|---|---|
| Clearly demonstrates what the words say | 5 | 4 | 3 | 2 | 1 |
| Uses color, representations, and labels effectively | 5 | 4 | 3 | 2 | 1 |
| How could this scene be improved? | | | | | |

Writing _____/10

Function _____/10

Interactions _____/10

Scenes _____/25 (5 x 5)

Connectivity _____/10

References _____/5

Total _____/70

| Points (10/5) | Outstanding (10/5) | Very good (8/4) | Acceptable (6/3) | Some problems (4/2) | Poor (2/1) |
|-------------------------|--|--|--|---|--|
| Writing and page layout | The writing succinctly yet completely describes the structure and interaction between the DNA and protein. There are no grammatical or spelling errors, and the page is well organized | The writing describes the structure and interaction in good detail. There are no grammatical or spelling errors. | The writing generally describes the structure and interaction OR there are minor grammatical or spelling errors. | There are minor factual errors or omissions in the description of the interaction and/or there are distracting mechanical errors. | There are glaring errors in the description of the interaction, poor sentence and paragraph structure, and/or mechanical errors. |
| Function | The function of the DNA binding protein is brilliantly described and explained with great detail. | The function of the DNA binding protein is clearly described and explained well. | The function is described, but details are missing or is wordy. | The function is inadequately described or there are factual errors. | The function is absent or there are glaring errors. |
| Interaction | The interaction between DNA and protein is clearly illustrated and described in excellent detail. | | The interaction is shown and there are some details. | There are some problems in the description; either facts are missing or not shown. | How the DNA and protein interact is not shown in a way that teaches the reader anything. |
| Scenes (5 pts each) | The image is clear and to the point. All details are relevant and clearly labeled | . | The structures of interest are represented but there are distracting details, missing labels | | The image is obscured or there are distinct errors. |
| Connectivity | The image clearly shows what the words are saying. | | | | The image is unrelated to the linking text. |