**Interactive Exploration of Molecules Involved in Gene Expression Regulation**

Your task is to produce an online guided tour of a molecule involved in gene expression regulation. To capture your intended flow we will use the program Sketchfab, which enables viewers to interact with your molecule in three-dimensional space. By annotating specific sites of interest, Sketchfab allows you to mimic the delivery of these descriptions and the transitions between them.

Construction of your planned tour requires four steps:

1) *Read the article* you have been allocated which describes a molecule involved in gene expression regulation.

2) *Decide on 5 parts of the molecule you want to illustrate* and what you want to say about these features. It is also important to think of the perspective from which you want your audience to see the feature.

3) *Import the molecule into PyMOL*. In here, you can choose to represent the molecule, and parts of the molecule, in many different ways. This creates the basic shape for your tour and allows you to draw attention to the features you want to talk about.

4) *Import the PyMOL graphic into Sketchfab* for the tour. This involves annotation of the features you want to illustrate as well as writing a brief overview of the tour.

Your target audience will have a scientific background, but not necessarily one in gene expression regulation.

**PyMOL Activities**

If you need a refresher in using the basic features of PyMOL, there is a short tutorial available on Canvas. Make sure you have the *latest version* of PyMOL installed.

To download and install PyMOL onto your computer, make sure you save the license from this page:

<https://protect-au.mimecast.com/s/0bDZCWLVXkUn8kmyc6YySw?domain=pymol.org>

Install PyMOL 2.0 and provide the license file if required (you can also add by opening PyMOL and navigating to “Help” in the top menu bar and then choose “Install new license file” if necessary).

**Transferring a PyMOL Model to SketchFab**

This involves exporting the data from Pymol as a COLLADA (.dae) file. If you cannot export as a COLLADA, check the version of PyMOL you installed.

To upload the .dae file to SketchFab, you will first need to make an account.

Once uploaded, save the annotations at the camera positions that best illustrates the feature you are highlighting:

* To edit, click the “3D settings” button on the right. In here you can add annotations (5th button from the left) and even define the view that gets zoomed into when the annotation is clicked.
* Save the settings to leave the edit screen to see how the model tells your story.

The more creative and braver of you might fiddle around with some of the other editing tools, but for our guided tour simulation, we only need annotations.

**Assessment Schedule and Criteria**

This assignment is comprised of two parts. The main Sketchfab annotation is worth **6 marks**. A pass-level Sketchfab submission will have a title, a brief description to orient the viewer (some idea of the context of the model) and the molecule will be clearly annotated at five points with a correct statement. A high-distinction submission will exhibit creative model preparation and rendering, superior insight in the choice, flow and articulation of the annotations, and a thoughtful, yet concise, description. The full grade descriptors are below. The second part of the assessment requires each student to review two of their peers’ Sketchfab submissions. This review will formally be due in Week 8 and will be worth **1 mark**.

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| High Distinction  85% - 100% | As for the criteria for ‘Distinction’, however the work also shows a high degree of **originality** and **creativity**. There is evidence that the view of teaching and learning in professional, vocational and/or higher education and their application in practice, have contributed to personal learning. There is good evidence of **critical reflection** on academic practice and identification of strategies for development. There is evidence of the ability to generalise the subject content to areas not covered in formal class session. |
| Distinction  75% - 84% | The work shows a good appreciation of the general purpose of the topic. There is good coverage of the topic with relevant and accurate support and a **well-developed scholarly argument**. The work demonstrates a clear view of how the various aspects of the topic **integrate** to meet the purpose. There is good evidence of **application** of assignment content to a relevant context. |
| Credit  65% - 74% | The work is relevant, accurate and addresses several aspects of the topic. There is **demonstration of understanding** in relation to a reasonable amount of the content and a scholarly argument has been advanced. There is emerging evidence of an **overall integrative view** of the topic, and growing awareness of application or integration. |
| Pass  50% - 64% | The information in the various aspects of the work is relevant and accurate but is not integrated and only covers core aspects of the topic. There is an attempt at a scholarly argument and the work indicates a limited understanding of the topic. |
| Fail  0% - 49% | The information in the work is irrelevant, inaccurate or has missed the point. The work is insufficient; there is a lack of engagement with learning tasks or a failure to submit in the agreed timeframe. |

**Exemplars**

These examples all have some great attributes and would have received a D/HD.

* <https://skfb.ly/6JTLB> Great overview and biological insight. Creative use of PyMOL
* <https://skfb.ly/6J8QB> The same molecule as above, but with a creative twist
* <https://skfb.ly/6R7VK> Powerful depictions and orientations. Encourages viewer participation- very creative. Introduction correlates well with tour. Well-structured.
* <https://skfb.ly/6R8YY> Creative and engaging. Introduction invites reader to start tour.
* <https://skfb.ly/6JTNt> Creative use of PyMOL. Great overview
* <https://skfb.ly/6JBTI> Went above and beyond in using Sketchfab to illustrate key interactions