**“Cell Factory” assignment**

Background

The living cell is an amazing, complex factory on a molecular scale! A common analogy is to represent the cell as a factory or a city. This is an excellent way to visualize (and remember) what all the cell’s components do. Several examples are listed in the table, below, and you can find many other ideas on the Internet.

Assignment

Using your textbook and the Internet as resources, complete the following “Cell Factory/Cell City” assignment. I am looking for a 1-page professional-looking drawing, plus around 2 pages of writing for item #3. Please complete the assignment on separate paper and submit as an email attachment when you are done. (100 points possible)

1. Draw a typical human (animal) cell. Make your drawing fill an 8-1/2 x 11 page. Show the complete cell, from the cell membrane all the way down to the nucleus. Include all the components & organelles listed in the table below (in the 1st column). For very small items – such as mRNA, tRNA, ribosomes, etc. – you may draw them off to the side of the main cell structure, sort of like separate ‘detail’ sketches. Use some method of incorporating COLOR other than just black and white, and TAKE PRIDE IN YOUR DRAWING.
2. Label all the parts with their ‘correct’ names (cell membrane, cytoplasm, etc) AND ALSO label them with ‘factory’ or ‘city’ names which you think are appropriate. If you want, you can choose a different analogy, such as country, planet, school, cruise ship, etc.
3. On separate paper, write out the name of each cell component shown in the table below, along with
4. A short paragraph explaining what it actually does in the cell,
5. Its ‘factory’ or ‘city’ name, AND
6. Why it seems to fit that name

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|  | “Cell Factory” | “Cell City” |
| Cell membrane | Fence | International border |
| Transmembrane proteins | Guard shack or Security detail | Border crossing |
| Nucleus | Head office | City Hall |
| Nuclear membrane | Office security | City Hall fence/Police? |
| Nucleolus | CEO’s office | Mayor’s office |
| DNA | Parts list or blueprints | City planning dept. |
| mRNA (messenger RNA) | Post-It Notes or delivery orders | Blueprints |
| tRNA (transfer RNA) | Parts handling machines or ‘jigs’ | Construction workers? |
| Cytoplasm | Factory floor | Environment |
| Mitochondria | Power plant | Power plant |
| Chloroplasts (in plants) | Solar panels | Solar panels |
| Endoplasmic reticulum | Assembly area or Shop floor | Construction jobsite? |
| Ribosomes | Work stations | Work benches |
| Golgi Apparatus | Packaging & shipping dept. | Post Office or UPS/Fedex |
| Lysosomes | Janitorial dept. | Recycling plant |
| Vacuoles & vesicles | Shipping containers | Railroad car? |
| Centrosome | Road building dept. | Road building dept. |
| Microtubules | Highways | Highways |
| Motor proteins | Delivery truck | Locomotive? |
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