Lynn English High School Science
Lesson Plan: The Immune System and Disease

Teacher: Lauren Mezzetti

Date: TBD

Subject area / course / grade level: Biology I/Grade 9

Part I
Materials for each lab group:
- Microscope
- 4 prepared microscope slides
  - diseased lung (cancer)
  - normal lung tissue
  - **n**ormal blood cells
  - diseased (leukemia)

Part II
- Computer lab
- Web quest Jigsaw worksheet

MA Standards: 2.6 Describe the cell cycle and the process of mitosis. Explain the role of mitosis in the formation of new cells, and its importance in maintaining chromosome number during asexual reproduction.
4.7 Recognize that communication among cells is required for coordination of body functions.
NGS Standard HS-LS1-4.: Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

Lesson objective(s):
Part I-Content preparation
- Students will observe, draw and identify the differences between normal and diseased tissue
- Students will explain briefly how the immune system works to defend against pathogens
- Students will investigate how scientists are working to develop cures and treatments for diseases such as leukemia and cancer

Part II-Cell Signaling Web quest and visit
- Students will investigate how Cell Signaling researches and manufactures products that help scientists discover ways to treat cancer and other diseases.
- Students will work in cooperative groups to research Cell Signal and report back to other groups on what they have learned about Cell Signaling.
- Students discuss with Cell Signal representative their findings and prepare questions for the visit.

Possible future lesson for Cell Signaling
- Students perform an ELISA (enzyme-linked immunosorbent assay) a test that is used to study reactions of the immune system and detect antibodies in the blood.

Differentiation strategies to meet diverse learner needs:
Discuss the meaning of the word ***anti-*** and how it will be used many times in the discussion of the immune system-antibody, antigen, antibiotics, antiviral, antiseptic

ENGAGEMENT:
1. Students observe cells on Smartboard and determine what type of cells they are are
2. Students then are shown diseased cells and discuss the differences they observe with the person beside them.
3. Class discussion on cancer, how they may have a family member affected by cancer or other diseases.

EXPLORATION
Lab Investigation: Observing Normal and Diseased Tissue

Lynn English High School Science
Lesson Plan: The Immune System and Disease

EXPLANATION

Read 31.1 & 31.2 on the immune system and antibodies.

Define these key words from your reading:

- pathogen
- antigen
- antibodies
- immune system
- cancer
- leukemia

Notes: PowerPoint on the Immune System and Immune Responses

ELABORATION;

Cell Signal Web Quest Jigsaw:

1. Students working in assigned teams are assigned topics to investigate about Cell Signaling. Each group will then discuss their findings on their assigned topic, each becoming an expert.
2. Students report out to other groups and share their findings about Cell Signaling Technology (CST).
3. Class discussion on Cell Signaling. What was most interesting? What questions would they have for visit from Cell Signaling representive?

Topics:

- **About:** What is the history of CST? When was CST founded; who founded it and why? Where is CST located and what other locations does it have?
- **Products**-what does CST manufacture? How are their products used and by whom? Investigate at least 3.
- **Applications**-List at least 3 of their applications and what they are used for-click on the blue links to find out.
- **Careers**-what types of jobs are available and what qualifications and education do you need to apply? http://www.cellsignal.com/about/employment.html
- **Publications/News**: What new advancements and press has CST had recently? Describe at least 3. Visit: http://www.cellsignal.com/about/press/index.html

EVALUATION

Students will be evaluated on their completed lab reports and Web quest questions using our school wide rubric for technology.

Other Resources:

https://www.cellsignal.com/technologies/xmt/index.html
http://blogs.fanbox.com/SinglePost.aspx?pbid=1559205&post=2014140&mode=&link=-1&page=-1&dt=010108&mlid=-1&vet=-1&src=-1&bts=2&fs=-1&apid=-1
http://www.mayoclinic.org/diseases-conditions/cancer/in-depth/monoclonal-antibody/art-20047808

SLIDES FOR ENGAGEMENT: