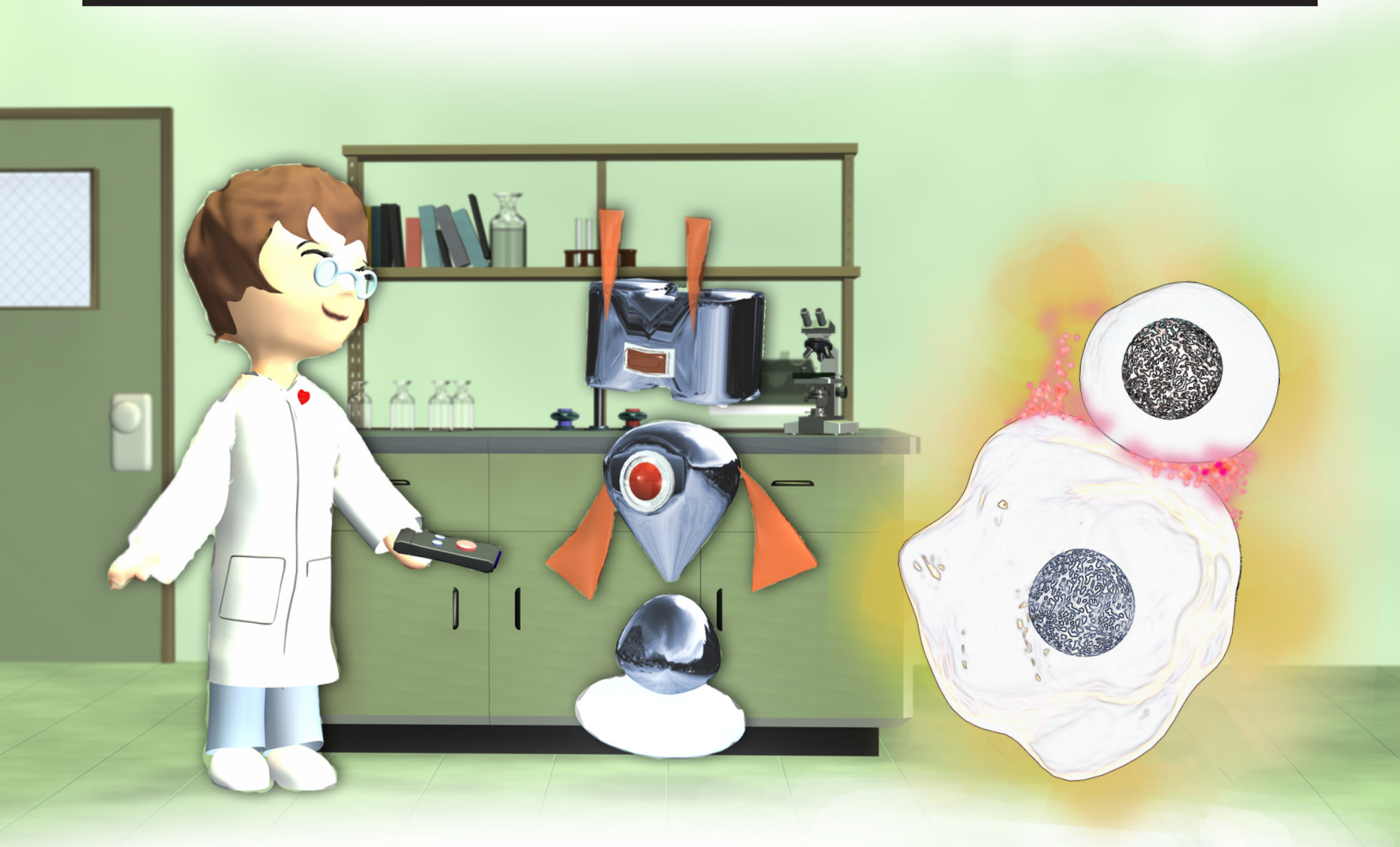


DR. ALLEVABLE AND  
REGENEROBOT'S  
**Exploration**  
ADVENTURE

WEBQUEST



# THE IMMUNE SYSTEM



## Student Pages



**REGENERATIVE MEDICINE**  
THE FUTURE OF HEALTH  
Planetarium shows, movies and  
educational web tools  
[www.sepa.duq.edu](http://www.sepa.duq.edu)

Produced by Regenerative Medicine Partnership in Education

Duquesne University

Director John A. Pollock ([pollock@duq.edu](mailto:pollock@duq.edu))

Art Director Joana Ricou

Content Developers Gerra Bosco and Brianne Miller

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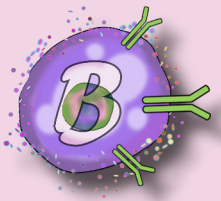
Name

# Sergeant System's Immune System Defense Team Webquest



Hello! I'm Sergeant Cell and I am in charge of the Special Operations Teams here at the ImmunoSystem Police Station.

Thanks so much for coming down to the Station to help us put our new team together. We really need your help! Today, you will be working to put together the new Special Operations Defense Team for the Immune System. The main purpose of this new team will be to detect and fight infections caused by germs and other harmful things in our bodies. The personnel you chose to fill the available positions will keep the human body healthy!



Before you hire the new team, the department will need you to do some background research for the hiring process. We have a list of applicants we need to place here at the department. To find out more about each of these applicants, I have provided the following directions and questions for you to follow. Answering the questions will help guide your background research on each applicant and will help you decide who should be placed in each position! To help your research process, let me give you a little background on the Immune System:

## The immune system

The immune system is not located in a specific organ. It's easiest to think of your body's immune system as a group of different types of cells and tissues that work together to protect nearly every area of our body. Each type of cell is designed to perform certain functions, such as killing damaged or infected cells, carrying messages, making antibodies, or carrying away debris.

Besides what I have mentioned above, the most important function of the immune system is to distinguish what cells and substances belong to your body and are healthy, and which don't belong or are unhealthy! Your immune system has to be very smart to be able to tell the difference between both, so you will need to really think hard about who should be hired!

Top to bottom:  
macrophage, T cell and B cell.

Your Notes

**Task**

As I told you at your arrival to the station, you will be helping us fill the open job positions in our new Special Operations Team for the Immune System. Your job today will be to answer the following questions about each applicant to guide your research. Then, you will use these descriptions of each applicant to assign each one to an open position.

**Web site Resources**

To gather your background information, you can use this awesome web site: When you reach the computer lab, just type in:

**[http://www.sepa.duq.edu/regmed/immune/immune\\_intro.html](http://www.sepa.duq.edu/regmed/immune/immune_intro.html)**

I read this information over before you came and think you will find a lot of the information very helpful! Make sure you read all of the information on the web site - we might need to discuss some of your potential hires! At the end of this activity, you will show your employment supervisor and fellow researchers (your teacher and classmates as we sometimes like to call them) exactly what you have learned about each of the applicants.


**Process**

You will use the internet to complete the background information search for each of the applicants. Please follow the directions on the following pages of your Reading Guide to finish your research. After you complete each step of your task list, you will start the given assignment in class.

Once you complete your background research, you will create an Employment Profile for each of the applicants you plan to hire. On the Employment Profile sheet, create a name for the new employee, create a job title for that employee based on the information you find, and write a description of the applicant's role in the immune system. Make sure to include the following information in the Job Description:

- ◇ Type of Applicant - for example "B cell," "vaccine," or "antibody."
- ◇ Job Title - make up a police job that is similar to what the applicant can do.
- ◇ List any special jobs that this applicant could perform. For example, "Alexander Antibody" can stick like glue to germs!

**Additionally,** you will need to create a drawing of the job

Employment Profile	
	
Location: ImmunoSystem Police Station Department: Special Operations Department Division: Immune System Defense	
Research Agent's Name: Sarah Smith	
Date Research was Completed: January 21, 2008	
Name of New Employee: Alexander Antibody	
Job Title: Arresting Officer	
Job Description: Mr. Antibody is also known as a receptor. He helps a B cell recognize an intruder in the body. Mr. Antibody will stick to this intruder and hold it "under arrest. This happens so the intruder cannot move or multiply to make more harmful intruders.	

*This is an example of the Employment Profile for Alexander Antibody.*

applicant in the blank box located in the upper left corner of the profile template. Feel free to be creative with your drawing! You can use the web site provided if you need an image as a reference or use a different web site approved by your teacher. Have fun and don't forget to share your finalized projects with your classmates to compare and contrast information you found out about each applicant.

Please follow the directions provided on the following pages. If you have any questions, remember to quietly raise your hand and your teacher will be around to help. Also, take a minute to think about proper computer lab behavior you have learned. If you are unsure, feel free to ask your teacher again!

### Evaluation

Your webquest will be graded using the rubric below. Be sure to read through the rubric, so you know what is expected of you.

Category	4 Excellent	3 Good	2 Average	1 Needs Work
Teamwork	Partners are supportive and share responsibility effectively 90%-100% of the time with no conflicts. Solid listening and communication skills are apparent.	Partners are supportive and share responsibility effectively a minimum of 80%-89% of the time with few conflicts. Good listening and communication skills are apparent.	Partners are supportive and share responsibility effectively a minimum of 70%-79% of the time with some conflicts. Average listening and communication skills are apparent.	Partners are not supportive and do not share responsibility effectively. Poor listening and communication skills are apparent.
WebQuest Completeness	Sections #1-#5 have a total of 100% of the questions answered.	Sections #1-#5 have a total of 85%-99% of the questions answered.	Sections #1-#5 have a total of 70%-84% of the questions answered.	Sections #1-#5 have a total of less than 70% of the questions answered.
Answer Accuracy	Questions are answered with 90%-100% accuracy.	Questions are answered with 80%-89% accuracy.	Questions are answered with 70%-79% accuracy.	Questions are answered with less-than or equal-to 69% accuracy.
Employment Profile Evaluation	Includes all of the following: - New employee's name - A job title - Job description including: o Location in the immune system o Main role in the immune system - Special jobs - Drawing of employee	Missing 4-6 of the following: - New employee's name - A job title - Job description including: o Location in the immune system o Main role in the immune system - Special jobs - Drawing of employee	Missing 1-3 of the following: - New employee's name - A job title - Job description including: o Location in the immune system o Main role in the immune system - Special jobs - Drawing of employee	Missing all of the following: - New employee's name - A job title - Job description including: o Location in the immune system o Main role in the immune system - Special jobs - Drawing of employee

Your Notes

### Applicant #1 - The Skin

(Please check off when complete)

- Go to the following web site:  
[http://www.sepa.duq.edu/regmed/immune/immune\\_intro.html](http://www.sepa.duq.edu/regmed/immune/immune_intro.html)
- Read the text on this page.
- Next, click the "General Mechanisms" link at the top of the web page
- Read the text on this web page.
- Answer the following questions:

**1. Lots of weird things like hair and mucous help protect your body. In particular, the skin is our first defense against germs! Why is the skin a good defense mechanism for the immune system?**

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**2. What would germs do to the body if you didn't have skin?**

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### Applicant #2 - Histamine

(Please check off when complete)

- Reread the section titled "General Mechanisms," if necessary.
- Answer the following questions:

**1. Histamines are an important chemical in the body. What is their purpose in the immune system?**

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**2. True or False? Circle your response. If it is false, rewrite the statement so it is true!**

Histamines are released when the skin blocks germs from entering the immune system.

True                      False

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Your Notes

**3. Cause or Effect? Finish each sentence by filling in the cause or effect of the statements below. Decide if what you wrote is a cause or an effect of the written portion of the statement.**

a. Warmer temperatures \_\_\_\_\_  
\_\_\_\_\_.

Cause or Effect? \_\_\_\_\_

b. \_\_\_\_\_ will bring white blood cells to the site of infection more quickly.

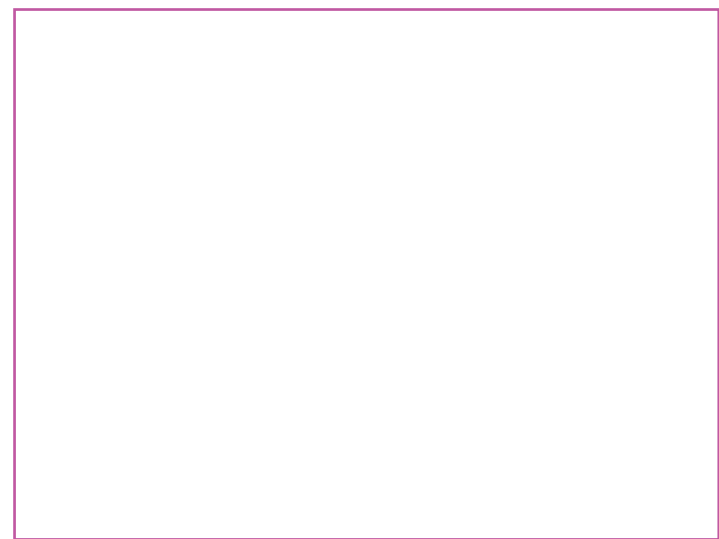
Cause or Effect? \_\_\_\_\_

**Applicant #3 - Macrophage:**

*(Please check off when complete)*

- Reread the section titled "General Mechanisms," if necessary.
- Answer the following question:

**1. The macrophage is a swallowing cell, it can engulf things through phagocytosis. Draw what a macrophage looks like when it is eating a bacteria:**



**Applicant #4 - T Cell:**

*(Please check off when complete)*

- Click the "T cells" link at the top of the web page
- Read the text on the web page.
- Answer the following questions:

**1. Match the descriptions in the left column with the letter of their answers on the right!**

Match	Descriptions	Answers
	1. T cells are a type of white blood cell called _____.	a. intruder organisms and infected cells
	2. This type of T cell can tell if another cell is healthy or infected.	b. Killer T Cell
	3. This type of T cell carries information and decides when to tell other immune cells to carry out an immune response.	c. lymphocytes
	4. When a Killer T cell decides that a cell is unhealthy, it can destroy with _____.	d. specific
	5. T cells can identify individual germs because they are _____.	e. Helper T Cell
	6. To be able to do their job properly, T cells must learn to only attack _____.	f. enzymes

**2. Why do some T cells remain in the body, even after successfully getting rid of an intruder?**

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**Applicant #5 - B Cell:**

*(Please check off when complete)*

- ◇ Click the "B cells" link at the top of the web page
- ◇ Read the text on the web page that appears
- ◇ Answer the following questions:

**1. The B cell is a special kind of swallowing cell. What do swallowing cells do?**

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Your Notes

**2. What is the B cell's main job as a part of the immune system?**

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**3. True or False? Circle your response. If false, rewrite the statement so it is true!**

The receptor site is a very important part of the B cell – it is called an antibody. This receptor site is a specific binding site on the membrane of the B cell, which means it can bind to many different kinds of harmful particles.

True                      False

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**Applicant #6 - Antibodies**

*(Please check off when complete)*

- ◇ Reread the web page titled "B cells," if necessary.
- ◇ Answer the following questions:

**1. Pick the True Statement from each pair below:**

Antibodies are produced by B cells.	<b>Or</b>	Antibodies are produced by T cells.
The antibodies of one B cell can bind to many kinds of harmful particles.	<b>Or</b>	The antibodies of one B cell can bind to only one kind of harmful particle.
B cells release antibodies all the time.	<b>Or</b>	B cells only release antibodies after becoming plasma B cells.

**2. How do antibodies work? Explain.**

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**Applicant #7 - Vaccine**

*(Please check off when complete)*

- ◇ Reread the web page titled "B cells," if necessary.
- ◇ Answer the following questions:



Your Notes

**1. We get vaccines all the time. What is a vaccine?**

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**2. True or False: Correct if it's wrong:**

A vaccine exposes your immune system to a live virus or bacteria so that your B cells will create the specific antibodies. So if you ever come in contact with them, your B cells will attack it quickly and you won't get sick!

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**Conclusion**

Wow! You're done already? I hope you learned about some of the different parts of the immune system and how they work together to protect your body from germs. Remember to Well look below for other fun sites to discover more about the immune system!

Some more questions:

Why do you think eating healthy food helps your immune system keep you healthy?

Why is having clean water important? What happens if we drink dirty water?

Why is having clean air important?

**More Web sites about the Immune System**

**Kid's Health Problems:** [http://www.kidshhealth.org/kid/health\\_problems/index.html](http://www.kidshhealth.org/kid/health_problems/index.html)  
 Find out more information about different kinds of health problems kids can have that affect their immune system!

**The Lymphatic System:** <http://www.acm.uiuc.edu/sigbio/project/updated-lymphatic/lymph7.html>  
 Associated with the University of Illinois.

**Microbiology and Immunology On-Line:** <http://pathmicro.med.sc.edu/ghaffar/innate.htm>  
 This web site is good reference for the non-specific immune system with animated tutorials for high school and above. Associated with the University of South Carolina.

**The Immune System in More Detail:** [http://nobelprize.org/educational\\_games/medicine/immunity/immune-detail.html](http://nobelprize.org/educational_games/medicine/immunity/immune-detail.html)  
 This web site is a great reference for middle school and above with cartoons and games. Associated with NobelPrize.Org.

**Specific Immunity Animation:** <http://science.nhmccd.edu/biol/inflam.html>  
 This web site contains a great step-by-step animation of some of the more complicated interactions in cell- and antibody-mediated immune response. Associated with North Harris College, Houston TX.