Lesson 4

A Malignant Flame II

*In this lesson you will learn more about inflammation and some related serious diseases.

Before You Read

Do you know...

- An immune system is composed of the biological structures and processes that protect an organism from disease by finding and killing pathogens.
- Primitive immune systems evolved in ancient eukaryotes and are still present in modern animals.
- Immunodeficiency is when the immune system fails to work, as with AIDS. In contrast, autoimmune diseases are caused by a hyperactive immune system that attacks normal tissues.

I Look at the comic strips below. Use your own logic, figure out the following questions based on the pictures.

1. What do macrophages do on Day 1?
2. When will a microphage take a rest?

Day 0

▲ Cell protection war— the viruses are invading the body!

Day 1

▲ The viruses invade the body and macrophage cells begin to fight against them, but macrophages are soon overwhelmed.
The macrophage cells then trigger T-cells, which try to identify the virus to fight against it more effectively.

The T-cells then begin to aggressively attack the viruses.

When the viruses are under control, the macrophages continue to attack them until they have been defeated.

Answer the following question.

Look at a sentence from part 2 of the article *A Malignant Flame*, “Chronic diseases—and their underlying inflammatory conditions—are hallmarks of an aging population.” The reason for this is that the aged often have poor immunity against viruses. Look at the following medical conditions. Which diseases are considered chronic, rather than acute?

- H1N1
- cancer
- Avian influenza
- apoplexy
- pneumonia
- cardiopathy
- diabetes
- stomach ache
A Malignant Flame II

(...continued from Unit 4 Lesson 3)

By Gary Stix

A Chemical Trojan

One group is contemplating a radically ambitious treatment, a molecular Trojan horse of sorts. Claire Lewis and Munitta Muthana of the University of Sheffield in England and their colleagues have designed a drug delivery scheme that takes advantage of the natural attraction of macrophages to the oxygen-starved areas in tumors. They have engineered macrophages to deliver a therapeutic virus to hypoxic tumor regions, which respond poorly to conventional treatments such as chemotherapy and radiation because of an insufficient blood supply. Once the macrophages arrive in a tumor (grown in culture so far), each one releases thousands of copies of the virus, which then infect the cancer cells, after which a protein in those cells activates the therapeutic gene in each virus. This action then directs synthesis of a cell-killing toxin. “The macrophage is migrating into a site and doing what we want it to do rather than driving tumor development in a normal way,” Lewis says.

The exact outlines of an anti-inflammatory strategy against cancer have yet to be elucidated. Tweaking immune cells that form a defensive barrier against pathogens bears its own risks. “It’s a very complicated issue,” DuBois notes. “If you magically shut down the immune system, you will have problems with opportunistic infections, just like with AIDS.” Use of TNF blockers in other inflammatory disorders has been linked to tuberculosis and other infections, even potentially lymphoma. Moreover, inhibiting the NF-κB pathway can paradoxically promote cancer in some instances. Constraining NF-κB can at times lead to tissue damage and a process of abnormal regeneration of that tissue that can foster cancer.

Still, it seems likely that a new generation of anti-inflammatory agents will join the chemotherapeutic arsenal. Chronic diseases—and their underlying inflammatory conditions—are hallmarks of an aging population. “We’re all a little bit overinflamed,” Pollard observes. Treating the smoldering embers that surround the tumor rather than just mutant cells could make cancer a disease we can live with.

Posted on Scientific American, September 2007, issue #67
After You Read

Comprehension Check

Circle the correct answer, or write a short answer on the line.

1. What does a chemical trojan refer to in this article?
   a. A drug delivery scheme that takes advantage of the natural attraction of cancer cells to the oxygen-starved areas in tumors.
   b. A drug delivery scheme that takes advantage of the natural attraction of red blood cells to the hydrogen-starved areas in tumors.
   c. A drug delivery scheme that takes advantage of the natural attraction of macrophages to the hydrogen-starved areas in tumors.
   d. A drug delivery scheme that takes advantage of the natural attraction of macrophages to the oxygen-starved areas in tumors.

2. Look at this sentence in paragraph 1, “They have engineered macrophages to deliver a therapeutic virus to hypoxic tumor regions, which respond poorly to conventional treatments such as chemotherapy and radiation because of an insufficient blood supply.” Who does they refer to in this sentence?
   a. A molecular Trojan horse
   b. Claire Lewis and Munitta Muthana of the University of Sheffield and their colleagues
   c. The natural attraction of macrophages
   d. The oxygen-starved areas in tumors

3. Look at this excerpt from in paragraph 1, what can you infer from this excerpt? “…which respond poorly to conventional treatments such as chemotherapy and radiation because of an insufficient blood supply.”
   a. That doctors may not succeed with chemotherapy if there is not enough blood supply in human body.
   b. That doctors can still perform chemotherapy if there is no blood in human body.
   c. That chemotherapy is best performed if there is no blood in human body.
   d. That chemotherapy is best performed if there is no hydrogen in human body.

4. What is the writer’s purpose in paragraph 1?
   a. To explain a kind of treatment, using a concept similar to that of the molecular Trojan horse
   d. To explain the story of the Trojan horse
   c. To explain a kind of treatment dissimilar to the concept of the molecular Trojan horse
   d. To explain what cell-killing cells are
5. In the last paragraph, anti-inflammatory agents/medicine are/is mentioned. Have you ever taken anti-inflammatory medicine; for example, when you had the flu? Give some occasions when people probably have to take anti-inflammatory medicine. Also, based on your prior knowledge or on surfing the Internet, find some anti-inflammatory medicines available on the market.

Answer: 

Recognizing Main Points

Match each paragraph with the corresponding answer. Write the letters in the blanks.

<table>
<thead>
<tr>
<th>Answer</th>
<th>Paragraph No.</th>
<th>Main Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Paragraph 9</td>
<td>b. Inflammation is now being linked to a number of serious diseases.</td>
</tr>
<tr>
<td>3.</td>
<td>Paragraph 10</td>
<td>c. In the future, anti-inflammatory agents are likely to be used alongside other forms of treatment.</td>
</tr>
</tbody>
</table>

Vocabulary Comprehension

General Vocabulary

For each following group, circle the word that does not belong. The words in grey are general purpose vocabulary.

1 explicate elucidate habituate clarify
2 promote pinch squeeze tweak
3 inhibit impede approve prohibit
4 loosen force constrain compel
5 smolder burn evaporate smoke
6 mutant transformed unchanged altered
7 pearl ash ember cinder
8 renewal regeneration revival terminate
9 trail conundrum pathway lane
10 promoter blocker inhibitor
**ESP Vocabulary**

Look at the extracts below from the reading. These words in color are commonly used in the field of science and technology. Match each word with a definition on the right.

1. Most commonly, chemotherapy acts by killing cells that divide rapidly, one of the main properties of cancer cells.
   - a. a cancer that affects the lymph nodes
   - b. the treatment of diseases, especially cancer, by drugs that are usually put directly into a patient’s vein
   - c. of or relating to chemotherapy
   - d. a serious infectious disease affecting your lungs

2. Use of TNF blockers in other inflammatory disorders has been linked to tuberculosis and other infections, even potentially lymphoma.
   - a. a cancer that affects the lymph nodes
   - b. the treatment of diseases, especially cancer, by drugs that are usually put directly into a patient’s vein
   - c. of or relating to chemotherapy
   - d. a serious infectious disease affecting your lungs

3. Use of TNF blockers in other inflammatory disorders has been linked to tuberculosis and other infections, even potentially lymphoma.

4. Still, it seems likely that a new generation of anti-inflammatory agents will join the chemotherapeutic arsenal.

**Language Focus**

**Transitional Words that Introduce/Bring out Additional Information**

When writing in English, if you want to introduce additional information you can use transitional words such as in addition, additionally, furthermore, moreover, what’s more, besides, and so on.

Look at the example from the reading. The word moreover is used to bring out further information on diseases related to inflammation.

Use of TNF blockers in other inflammatory disorders has been linked to tuberculosis and other infections, even potentially lymphoma. Moreover, inhibiting the NF-κB pathway can paradoxically promote cancer in some instances. (paragraph 9)

Here is another example:

Mary and her sister practice their violins; in addition, they study theory and music history.
Exercise

Underline the transitional words in the passage below.

Biological data are being produced at a phenomenal rate. For example as of April 2001, the GenBank repository of nucleic acid sequences contained 11,546,000 entries and the SWISSPROT database of protein sequences contained 95,320. On average, these databases are doubling in size every 15 months. In addition, since the publication of the H. influenzae genome, complete sequences for nearly 300 organisms have been released, ranging from 450 genes to over 100,000. Add to this the data from the myriad of related projects that study gene expression, determine the protein structures encoded by the genes, and detail how these products interact with one another, and we can begin to imagine the enormous quantity and variety of information that is being produced.

Corpus Tutorial & Practice: COCA

The transitional words introduced in Language Focus have slightly different usages and functions in English. Some serve as conjunctions and help to build arguments. For example, transitional words like besides, additionally, and in addition, function as conjunctions. However, transitional words such as furthermore, what’s more, and moreover, help to build arguments. Many Chinese students misuse the phrases when they write in English.

Now, we are going to distinguish between the functions of in addition and moreover by using COCA. Below is the concordance lines for in addition.

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>1</td>
<td>In addition, the authors speculated that after-school prog on children, more rigorous evaluations are necessary to convincingly document this potential.</td>
</tr>
<tr>
<td>2</td>
<td>In addition, the data derived from the narratives used in the pre descriptive information that would normally be difficult to obtain with a questionnaire.</td>
</tr>
<tr>
<td>3</td>
<td>In addition, the data being collected are typically used to infer som a coding scheme. This process is typically very time-consuming and labor intensive.</td>
</tr>
<tr>
<td>4</td>
<td>In addition, 49 girls described themselves as White, 4 as African American, 2 as adolescence), and 23 girls were aged 17-19 (late adolescence).</td>
</tr>
<tr>
<td>5</td>
<td>In addition, there was a trend to engage in more relaxation activities than in social activities 3.69, p = .06, ?² = .062.</td>
</tr>
<tr>
<td>6</td>
<td>In addition, linear regression analyses examined whether participants use of achievement themselves predicted the use of 28, p = .004, ?² = .14</td>
</tr>
<tr>
<td>7</td>
<td>In addition, qualitative characteristics of social support need parent support to enhance analysis of their relative influences on adolescent substance use.</td>
</tr>
</tbody>
</table>
In addition, a number of studies conducted in other countries using different youth outcomes as criteria.

In addition, following Musitu and Garcia (2001), we split the sample by sex.

Moreover, poor urban areas and found that pre-adolescent girls from poor families had low self-esteem. Moreover, they suggested that girls had a dehot in self-esteem ev.

Moreover, an adequate etiological explanation for the range of risk behaviors adolescents may engage in.

Moreover, these findings must be considered within the limitation.

Moreover, he painted and trying to imitate his work when he was not at home. Moreover, she began reading the Bible and attending Sunday school to learn the stories of.

Moreover, fully account for the messy and irrational actions that humans take for emotional reasons.

Moreover, as we have seen, they construct their models or programs.

Moreover, true long before the digitization of criminal data and the loss of obscurity. Moreover, just because only two-thirds of the prisoners were re-arrested does not

Moreover, racist stereotypes they had internalized prior to their migration were confirmed upon their arrival.

Moreover, because the conduct of their non-Muslim neighbors.

Moreover, “Touba is coming to town” (Ebin 1996:100) is made regularly. Moreover, Touba is a frame of mind. It is always carried in the heart.

Moreover, affiliation is another way of disparaging the group and, thus, contesting identity. Moreover, his rejection of their self-identification reserves Muslim identity for a

Moreover, allows us to examine the dividing lines that structure our engagement with one another.

Moreover, it provides a prism through which to understand the complex.

Moreover, and, subsequently, marks their involvement in the power dynamics of the city. Moreover, other Sunnis are already organizing a national organization designed.

Questions

1. Look at the concordance lines above. What nouns, noun phrases, or clauses follow the transitional word/phrase in addition and moreover? Provide five examples of each.
2. Look at the Result A and Result B above. Which one adds more information to the previous clause? Which one includes the statements that illustrate the fact?

Answer: ________________________________________________________________

3. Now, based on your previous answers. Decide which transitional phrase serves as a conjunction and which one helps to build arguments? Write your answers in the blanks.

<table>
<thead>
<tr>
<th>conjunction</th>
<th>building arguments</th>
</tr>
</thead>
<tbody>
<tr>
<td>In addition</td>
<td>Furthermore</td>
</tr>
<tr>
<td>Additionally</td>
<td>What’s more</td>
</tr>
</tbody>
</table>

**Tasks**

**Speaking**

*Look at the following chart, listing the five leading cancers for females and males in Taiwan.*

<table>
<thead>
<tr>
<th>rank</th>
<th>male</th>
<th>female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>hepatic carcinoma (cancer of the liver)</td>
<td>lung cancer</td>
</tr>
<tr>
<td>2</td>
<td>lung cancer</td>
<td>hepatic carcinoma (cancer of the liver)</td>
</tr>
<tr>
<td>3</td>
<td>colorectal cancer</td>
<td>colorectal cancer</td>
</tr>
<tr>
<td>4</td>
<td>gastric cancer</td>
<td>breast cancer</td>
</tr>
<tr>
<td>5</td>
<td>oral cancer</td>
<td>cervical cancer</td>
</tr>
</tbody>
</table>

*Form a pair and discuss the causes of the cancers listed above. Also, discuss the reasons for the differences between the lists for men and women.*

**Writing**

*Choose one of the cancers from the previous activity. Write 150- to 200-word describing the symptoms, causes and medical interventions related to this cancer. In addition, give some advice on preventative measures.*