Class Starters & Enders

Making the Most of Instructional Time
Five Minute Lessons

Class Starters and Enders help utilize the last minutes of class when a lesson ends but there is not enough time to start another, or for an interest approach at the beginning of class. Mini-lessons correlate to GPS in the program areas below.

Do They Really Put Rat Poison in Heart Medications?

Program Areas: Biotechnology, Healthcare, Agriculture

Instructions: Read the material and make notes of important points, answer questions, and be ready to discuss this topic.

Warfarin tablets used for thinning blood of patients who are at risk of a heart attack or stroke.

A common warning on rat poison reads, "This product may reduce the clotting ability of the blood and cause **hemorrhaging**. The **anticoagulant** action of this product may produce prolonged [clotting] times for 20-30 days after exposure." Warfarin, a **synthetic** compound that causes the thinning of blood in rat poison, can clearly be dangerous when consumed. What is generally unknown about warfarin is that the same **compound** is also used to prevent heart attacks and strokes.

In the early 1920s, there was an unknown **malady afflicting** cattle in northern parts of the United States and into Canada. Farmers had cattle dying for unexplained reasons. When investigated, it was found the cattle were dying from internal bleeding. Although clover pastures and hay are excellent cattle feed in most cases, it was discovered that molded clover hay was the culprit of this mysterious problem. While there are several plants that contain **coumarins**, once fungi attack these plants, causing mold, the coumarins turn into dicoumaral. **Dicoumarol** is a compound that limits vitamin K absorption. When the body does not have enough vitamin K, it loses the ability to clot blood.

After additional research the compound that was causing the problem was duplicated. The synthetic dicoumarol compound was given the name "warfarin" after the Wisconsin Alumni Research Foundation where the research was performed. Warfarin was extremely popular as a rat poison. Rats eat the warfarin, and due to the inability of the rat's blood to clot, they internally bleed to death.

Once warfarin made its debut as a rat poison, an unlikely event caused the research of warfarin use in humans. A US Army inductee tried to commit suicide by ingesting a large amount of warfarin. While at the hospital, he was treated with vitamin K supplements and made a full recovery. After this incident, doctors and researchers wondered if the deadly effects of warfarin in rat poison could be used to help humans by preventing hazardous blood clots.

While blood clotting is responsible for keeping a minor cut or scrape from bleeding continuously, clotting within blood vessels can be dangerous. If blood clots within vessels, it can result in a heart attack or stroke. By thinning the blood, strokes and heart attacks can be prevented. Due to warfarin's blood thinning ability, it began being marketed as a clinical blood-thinner. Warfarin made big news in 1955 when it was used to help save President Eisenhower's life after a heart attack. Since that time, medications containing warfarin have become some of the most widely prescribed medicines in the world.

Review

1. Warfarin was originally used as a _____ poison.
2. Moldy _____ hay caused hemorrhaging in cattle.
3. Dicoumarol is a molded compound produced by _____.
4. Vitamin _____ is responsible for helping blood clot.
5. Where did warfarin get its name?
6. What event led to warfarin being researched for healthcare purposes?
7. Blood clots can lead to _____ _____ and _____.
8. Which US president was saved using a medicine containing warfarin?

Language Connection:

Research/ Define the following:

- hemorrhaging
- anticoagulant
- compound
- afflict
- malady
- coumarins
- dicoumoral
- synthetic

History Connection:

President Eisenhower suffered from a heart attack in 1955. Research and write a one-half to one page report on President Eisenhower's life.

Georgia CTAE Resource Network - Written by Laura Glantzberg & Frank B. Flanders, Ed.D.