

A concept that our Pre-Health Sciences students often misunderstand during our discussions of Body Defenses and Immune Systems is the development of specific defense mechanisms. This is a very detail and terminology heavy topic. Consequently, students become bogged down in the specifics and overlook the concept that our systems develop two types of defensive white blood cells with different modes of action in response to infection by a pathogen.

To help make this concept more readily understood/recognized the lecture could be formatted as a story about a 'germ' invading my body with the inclusion of cartoon type visuals. The story could focus on the training of two groups of 'snipers' to recognize and destroy a specific pathogen ('unwanted invader') while not harming any of our body cells ('innocent bystanders'). One group of 'snipers' (cytotoxic T cells) uses large bazooka type guns to 'shoot' protein bullets (perforins) at any of the invading cells that they have been trained to recognize. The other group of 'snipers' (plasma cells), are 'gum spitters'. These cells release 'gum' (antibodies) that only stick to the invader making them easy targets for other defensive mechanisms.

Not only does a story provide the opportunity for students to establish a big picture view of the topic, but the story line of a sniper only working to find and eliminate one suspect (ie. one bank robber, not every bank robber) is relatable - this is a scenario students have likely encountered in television shows, novels and movies. As students work in groups during seminars, they can be encouraged to gradually replace terms like 'snipers' and 'gum spitters' with proper terminology.

To further encourage engagement and recall, visual representations of the analogy can be incorporated into slides with textual information. An example is below.

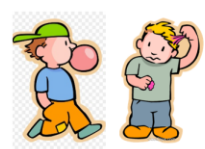
Two Types of Specific Immunity

SPECIFICITY for one antigen

2 armies of 'snipers' (WBC CELLS)

1. Antibody-mediated immune responses

- destruction of invader by **antibodies** produced by **plasma cells**



2. Cell-mediated immune responses

- destruction of invader by **cytotoxic T cells**

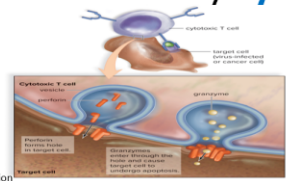


Image Credit: McGrawHill Education