

Some of the properties of the adaptive immune system include having a memory and being able to distinguish between self and non-self. One important element of the adaptive immune system are B-cells which produce the antibodies specifically interact with a foreign object, such a germ or toxin. Every B-cell specifically recognizes a different foreign object, and importantly, a healthy human body does not produce a B-cell that that recognizes the body's own cells. In the case it does, this is known as an autoimmune disease. The first time a germ enters the body, very few B-cells are there to react to it. The next time the germ enters the body, there are many more B-cells there to greet it, therefore the body reacts far more quickly and the person recovers from the illness more quickly than it had the first time. At this point, the person is immune to the germ. The object does not need to be living to be recognized by a B-cell, and in fact B-cells can react to a dead germ. Therefore dead germs, or fragments of dead germs, can be used as medicines known as vaccines. Vaccines provoke an immune reaction leaving the person immune to a later invasion by the live germ. When a foreign object is not normally dangerous, such as a food, but provokes an immune reaction anyway, due to having B-cells that recognize it, this is known as an allergy. An allergy can be dangerous, because each time an allergic person is exposed, the body produces more and more B-cells capable of reacting to the food product. As a consequence, body can be so sensitive that it can react to as little as 1/200000 of a peanut. In addition, the consequences of an immune reaction, such as the body heating up, or the tissues filling with fluid, become progressively more severe to the point where you can get symptoms, such as having the eyes swell shut, or undergo anaphylaxis. Therefore, it is important for those with peanut allergens, and for their peers to be aware of the dangers as well.