

Adjuvant Encyclopedia Article

Adjuvant

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Adjuvant

An adjuvant is any substance that enhances the response of the **immune system** to the foreign material termed an **antigen**. The particular antigen is also referred to as an immunogen. An adjuvant can also be any substance that enhances the effect of a drug on the body.

When antigen is injected into an organism being used to raise antibodies the effect is to stimulate a greater and more prolonged production of **antibody** than would otherwise occur if the antigen were injected alone. Indeed, adjuvants are very useful if a substance itself is not strongly recognized by the immune system. An example of such a weak immunogen is the capsule exopolysaccharide of a variety of **bacteria**.

Adjuvants exert their effect in several different ways. Firstly, some adjuvants retain the antigen and so "present" the antigen to the immune system over a prolonged period of time. The immune response does not occur all at once, but rather is continuous over a longer time. Secondly, an adjuvant itself can react with some of the cells of the immune system. This interaction may stimulate the immune cells to heightened activity. Thirdly, an adjuvant can also enhance the recognition and ingestion of the antigen by the immune cell known as the **phagocyte**. This enhanced **phagocytosis** presents more antigens to the other cells that form the antibody.

There are several different types of antigens. The adjuvant selected typically depends on the animal being used to generate the antibodies. Different adjuvants produce different responses in different animals. Some adjuvants are inappropriate for certain animals, due to the **inflammation**, tissue damage, and pain that are caused to the animal. Other factors that influence the choice of an adjuvant include the injection site, the manner of antigen preparation, and amount of antigen injected.

One type of adjuvant that has been of long-standing service in generating antibodies for the study of bacteria is known as Freund's Complete Adjuvant. This type of adjuvant enhances the response to the immunogen of choice via the inclusion of a type of bacteria called mycobacteria into a mixture of oil and water. Typically, there is more oil present than water. The oil and water acts to emulsify, or spread evenly throughout the suspension, the mycobacteria and the immunogen. Sometimes the mycobacteria are left out of the adjuvant. In this case, it is referred to as "incomplete" adjuvant.