Rituximab

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This series of graphics describes the different mechanisms of action that have been proposed for this monoclonal drug therapy. The aim of the therapy is to deplete B cells in order to interrupt several key aspects of an ongoing autoimmune response.

View associated Case Study – A 7 year old with severe muscle weakness and difficulty walking

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Rituximab Mode of Action

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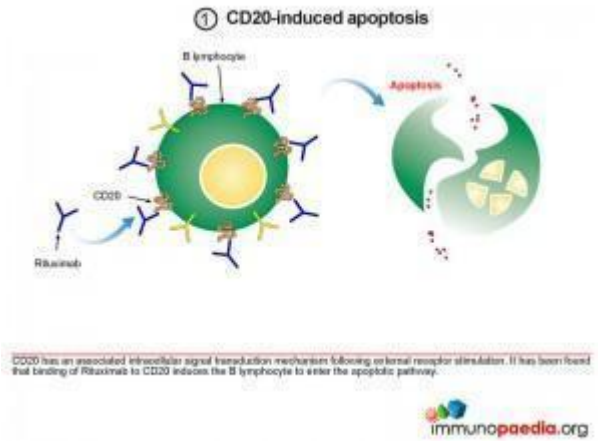
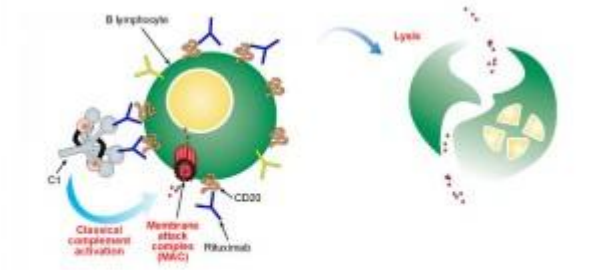


② Classical complement activation



Rituximab is an IgG class antibody that has an Fc portion. After binding to CD20 on B lymphocytes, the Fc portion is able to be bound by complement C1 protein. Binding of C1 activates the classical complement cascade which leads to the formation of the membrane attack complex and cell lysis.

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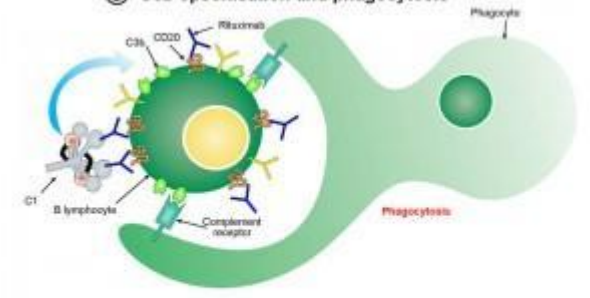
③ C3b opsonisation and phagocytosis



After binding of Rituximab to CD20 on B lymphocytes, complement C1 protein binds to the Fc portion and activates the classical complement cascade. The classical complement cascade generates complement C3b proteins from soluble complement C3 proteins. C3b covalently attaches to the surface of cells and opsonises them. C3b opsonised cells are detectable by complement receptors on phagocytes, such as neutrophils, dendritic cells and macrophages. Recognition of C3b opsonised cells by phagocytes induces phagocytosis and destruction of the cell.

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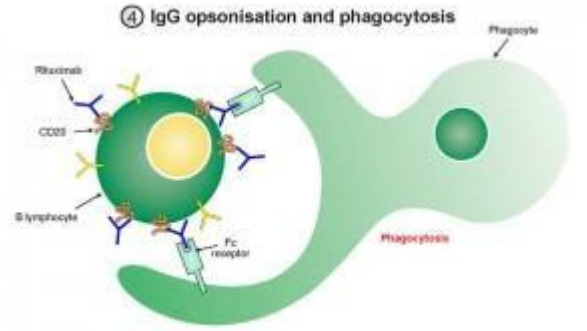
④ IgG opsonisation and phagocytosis



Rituximab is an IgG class antibody. Binding of Rituximab to CD20 on B lymphocyte opsonises them with IgG. The Fc portion of the IgG is detectable by Fc receptors on phagocytes such as neutrophils, dendritic cells and macrophages. Recognition of IgG opsonised cells by phagocytes induces phagocytosis and destruction of the cell.

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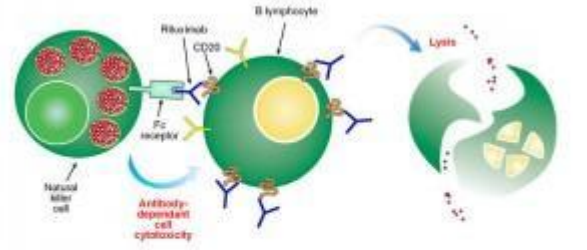
⑤ Antibody-dependent cell cytotoxicity by natural killer cells



Binding of Rituximab to CD20 on B lymphocytes opsonises the cells. Rituximab is an IgG class antibody which has a Fc portion detectable by Fc receptors on natural killer cells. Recognition of IgG opsonised cells by natural killer cells induces degranulation and lysis of the cell by antibody-dependent cell cytotoxicity (ADCC).

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