

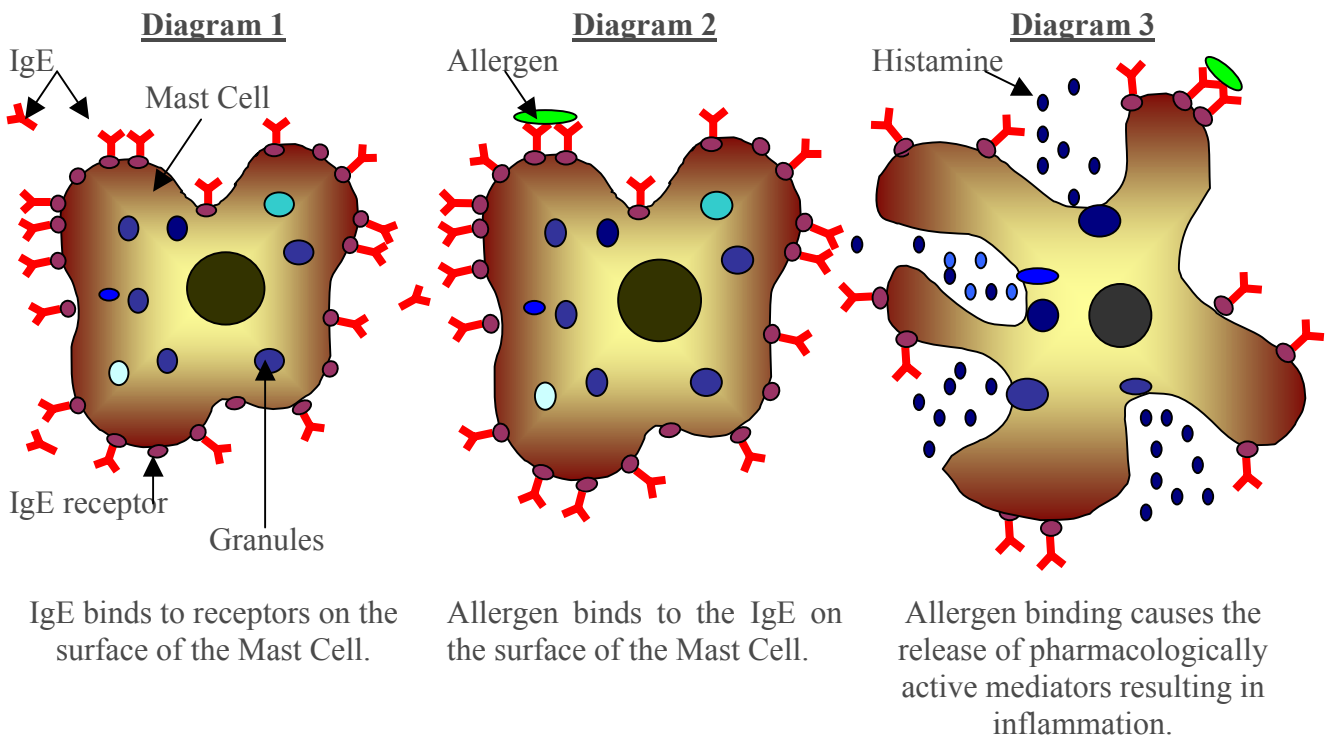
The Science Behind Skin Prick Testing.

Allergy diagnosis by skin prick testing has a firm scientific background. The technique focuses on the patients allergen specific IgE. IgE is a class of antibody that is produced by the body against allergens and it is responsible for precipitating allergic symptoms. People who do not have allergies do not produce the allergen specific IgE being tested for so the skin prick testing will show a negative result.

Allergen specific IgE produced by plasma cells travels throughout the body and attaches to receptors on a wide selection of cells associated with the bodies' immune system. When this IgE detects a particular allergen it triggers the familiar allergy symptoms such as those seen in allergic rhinitis and asthma.

The most important immune cells in the context of skin prick testing are mast cells; these cells express a large number of receptors (FcεRI) for IgE on their surface (diagram 1). Mast cells are found in large numbers throughout the body and are associated with connective tissue where they play an important role in allergic responses. In the skin there may be 10,000 mast cells per mm³ (Goldsby *et. al.* 2000). When a mast cell encounters an allergen that the IgE on its surface recognises (diagram 2), the interaction between antibody and allergen causes the mast cell to degranulate and release a large number of pharmacologically active mediators into the skin (diagram 3). Histamine is the most prominent mediator released; this decarboxylated form of the amino acid histidine is stored pre-formed in granules within the mast cell. Therefore, it can be released as soon as the IgE detects its target allergen. During skin prick testing histamine's main activity is to increase vascular permeability causing a reddening and swelling of the skin.

Visualising Concepts: IgE Localised on the Surface of Mast Cells Binds to Allergens Resulting in the Release of Pharmacologically Active Mediators.



Skin prick testing uses this IgE/mast cell mediated response to characterise allergenicity. An allergic person carries tens of thousands of IgE coated mast cells in their skin. As soon the allergen is detected an immediate (type 1) hypersensitivity reaction occurs causing the characteristic wheal and erythma. Individuals highly allergic to an allergen will have more IgE present under the skin than those only mildly allergic. Those not allergic to the allergen being tested will not have any IgE specific for that particular allergen. Consequently, the size of the reaction is linked to the degree of sensitivity of the patient. Therefore, the inclusion of the control solutions allows a measure of allergy to be taken. The negative solution contains the diluent used to manufacture the diagnostic solution without any allergen present. This gives an indication of how the patient responds to the chemicals in the solution without a hypersensitive reaction occurring. The positive control consists of histamine; the use of this solution gives an upper limit on the effects of this pharmacologically active mediator in the patient being tested.

By comparing the effect of each allergen-containing diagnostic solution with the positive and negative control solutions the patient can be “scored” for their allergic response to individual allergens. Once the patient’s allergies are clearly diagnosed the appropriate treatment regime can be administered. This treatment regime may be a course of specialised allergy immunotherapy (injection or oral vaccines) or as simple as moving some pets out of an allergic child’s bedroom. Accurate diagnosis is absolutely essential for effective allergy management.

Reference.

Goldsby R. A., Kindt T. J. and Osbourne B.A. 2000

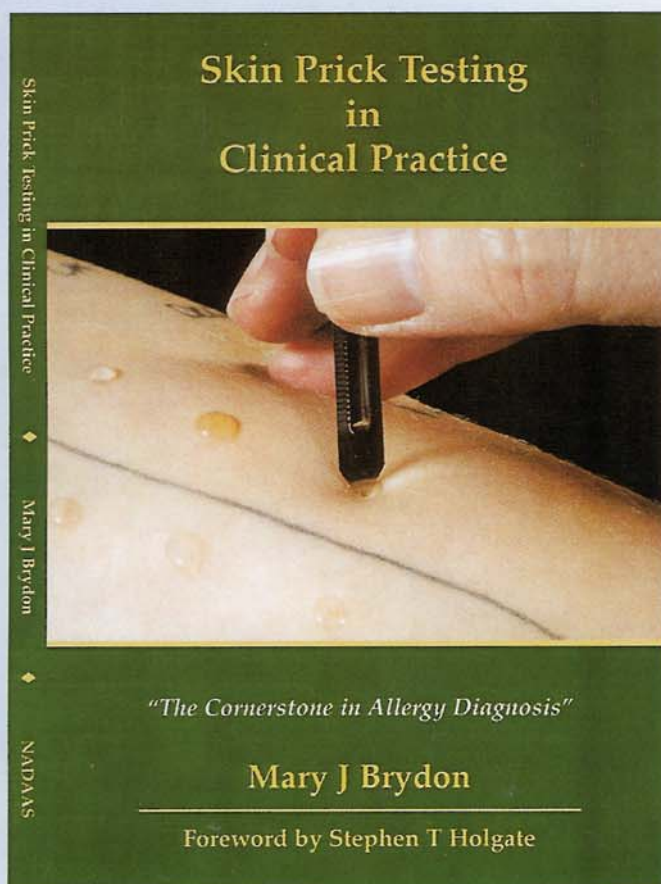
Kuby Immunology 4th Edition.

W. H. Freeman and Company.

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If you are interested in further information about Skin Prick testing request your copy of “**Skin Prick Testing in Clinical Practice**” from Allergy Therapeutics today. Mary J Brydon, a renowned expert in allergy care, wrote this educational 100 page hardback book with the support of an Allergy Therapeutics educational grant. Copies are available for **£16.59** in the UK (including postage and packing), see the attached flier for ordering details.

Skin Prick Testing in Clinical Practice



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