Skin biology video 4 Notes

Mast cells are found throughout the body and develop from haematopoietic progenitors, maturing in situ.

Mast cells are often found in **close proximity to nerves**, and it is widely assumed there is cross-talk between these elements.

Degranulation used to be thought or as an all or nothing phenomenon, but degrees of release of mediators occur. Mediators in the mast cell may be preformed ready for release, or may be synthesised in response to stimuli.

As well as **high affinity IgE receptors** there are low affinity receptors found on a range of cells (we don't need to learn about them fore present purposes).

Probably the most common type of **chronic urticaria** (defined as urticaria persisting for over 6 weeks) is due to IgG autoantibodies reacting directly against the high affinity IgE receptor (with no IgE bound).

Antigens can crosslink IgE molecules bound to the high affinity IgE receptor, but circulating IgE-anti IgE may also crosslink IgE bound to the high affinity IgE receptor, too (in the absence of antigen). Example of such antigens, would be peanuts, latex or penicillins. There may be other permutations of these units (IgE, IgG, IgE receptors etc) relevant to disease.

The round lesions (~1cm) of **solar urticaria** shown are due to UVR or visible light being applied directly to the skin via the liquid light guide of a **monochromator** (see Figures pdf). Each 'lesion' is a particular dose or waveband tested — in the image used, all the test sites are strongly positive). How UVR / visible light induces urticaria is not fully understood.

IgE may play a role in solar urticaria and other urticarias including dermographism. Serum from patients with solar urticaria may transmit the disease (suggesting a key role for a circulating factor)

Triple response of Lewis: the erythema of the initial reaction is vasodilation due to pressure; the flare is due to the axon reflex; and the weal is dermal oedema due to leakage of fluid. In conditions such as solar urticaria, the initial erythema / vasodilation is a result of the UV rather than pressure, but the exact mediators and mechanism linking UV with initial vessel dilatation is not clear. Mast cells are probably central to all these stages, and blockade of mast cell mediators inhibits or reduces **all** aspects of the triple response.

The **flare** is very much larger than the area of the initial erythema, and reflects other branches of the nerve that have been stimulated. The axon reflex is **not mediated via the spinal cord** (as other reflexes are), but involves only one nerve and its branches peripherally.

The different types of urticaria are dealt with in edderm101. Dermographism and solar urticaria, are both classed as **physical** urticarias.

Urticaria is a feature of anaphylaxis, a type 1 hypersensitivity reaction.

H1 receptors: Blockade of H1 receptors reduces urticaria, and blocks the response induced by injection of histamine into skin. H2 receptors are important in acid production in the stomach (and hence in gastric ulcers. H3 and H4 receptors play other roles, some of which involve the skin. The main receptor that is clinically relevant to the dermatologist is the H1 receptor.