# Simple models of anaphylaxis and of histamine and 5-hydroxytryptamine induced inflammation using the mouse pinna

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The mouse pinna may be used as a site for the study of allergic and inflammatory reactions. We demonstrate its use in two roles: firstly, pinnal anaphylaxis as a model of an acute allergic response; second, the inflammatory action of histamine and 5-hydroxytryptamine on the mouse pinna. Both systems provide simple, rapid and cheap methods for either drug screening or university class demonstrations.

The sensitization procedure for pinnal anaphylaxis has been described previously (Church, James & Miller, 1974). Male CFLP mice were injected subcutaneously with 0.1 ml of a 1/20 dilution followed fourteen days later by a further 0.1 ml of a 1/50 dilution of horse serum. The animals were challenged six to eight days after the second dose of horse serum.

Challenge was performed in a warm room (30-32°C) to which the animals were taken one hour previously to acclimatise. This environment facilitates rapid intravenous injections but does not significantly change the development of the reaction. Mice were lightly anaesthetized with ether and injected intravenously with 0.2 ml of 1% Evans blue solution. Immediately after this and while still anaesthetized, the mice were laid on their back and each pinna stabbed with a 21 gauge hypodermic needle through a drop of antigen (neat horse serum) or agonist dissolved in 0.9% sodium chloride solution. Thirty minutes were allowed for the subsequent blueing reaction to develop before the mice were killed and their ears cut off and mounted on cards. The reaction was measured as the area of blueing around the site of challenge.

Challenge of sensitized mice with antigen produced a sub-maximal reaction which is subject to diurnal variation, peak sensitivity occurring at 16.00 h and minimum sensitivity at 10.00 h (Miller & Church, 1975).

In non-sensitized mice, 5-hydroxytryptamine was more potent than histamine in inducing inflammation. The concentrations of agonists used to induce approximately equal sub-maximal responses were 0.2 mg/ml of 5-hydroxytryptamine and 1 mg/ml of histamine.

Pinnal anaphylaxis was partially inhibited by anti-histamine and anti-5-hydroxytryptamine agents and was reduced by anti-inflammatory drugs, β-adrenoceptor stimulants, phosphodiesterase inhibitors and corticosteroids but not disodium cromoglycate. Histamine induced inflammation was inhibited by histamine $H_1$-receptor antagonists injected subcutaneously 20 min before test, e.g. mepyramine ($ID_{50}$: 1.34 mg/kg) and diphenhydramine ($ID_{50}$: 2.51 mg/kg). Histamine $H_2$-receptor antagonists and 5-hydroxytryptamine antagonists were not active. 5-Hydroxytryptamine-induced inflammation was inhibited by specific antagonists administered similarly, e.g. methysergide ($ED_{50}$: 0.008 mg/kg) but not by antihistamines. Cyproheptadine administered similarly inhibited both histamine and 5-hydroxytryptamine induced inflammation ($ID_{50}$: 0.024 mg/kg and 0.16 mg/kg respectively).

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## References

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