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Cellular and humoral factors in anaphylaxis and immunity.

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Our analyses of the anaphylactic and immune reactions by means of perfusion experiments with isolated rabbit and guinea pig tissues have shown that the hypersensitive and immune, humoral and cellular factors may coexist in the bodies of anaphylactic and immune animals in the following combinations:

(*a*) *Cellular anaphylaxis* and *apparently normal blood condition.* This is illustrated by the lungs of four-week anaphylactic guinea pigs. Tested in the presence of normal blood, these tissues give a typical anaphylactic reaction. The blood perfused through normal lungs, produces no recognizable response. We refer, of course, only to the immediate anaphylactic response; the slow production of toxic phenomena being beyond the scope of the present analyses.

(*b*) *Cellular anaphylaxis* and *humoral anaphylaxis.* This is illustrated by the lungs of fourteen-day anaphylactic guinea pigs. Tested in the presence of normal blood, these tissues are markedly hypersensitive. The blood, perfused through normal lungs, produces a typical anaphylactic response.

(*c*) *Cellular anaphylaxis* and *humoral immunity.* This seemingly paradoxical phenomenon is illustrated by the lungs of immunized guinea pigs. Tested in the presence of normal blood, these tissues are markedly hypersensitive. The blood, perfused through anaphylatic lungs, prevents the anaphylactic reaction.

(*d*) *Cellular immunity* and *humoral anaphylaxis.* This second seeming paradox is illustrated by the hearts of anaphylactic rabbits. Tested in the presence of normal blood, these tissues are distinctly resistant. The blood, perfused through normal hearts, produces a typical anaphylactic response.

(*e*) *Cellular immunity* and *humoral immunity.* This is illustrated by the hearts of immune rabbits. These tissues are dis-

tinctly resistant. The blood prevents the reaction if mixed with anaphylactic blood.

(*f*) *Humoral anaphylaxis* and *humoral immunity.* This third seeming paradox is illustrated by the blood of partially immunized rabbits, which contains a thermo-labile anaphylactic substance, partially inhibited by a thermo-stable antitoxin.

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Absorption of foreign protein by the anaphylactic lungs.

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If the lungs of an anaphylactic guinea pig are repeatedly perfused with dilute foreign protein, either in Locke's solution or in 50 per cent. normal blood, the lungs are thrown into a typical anaphylactic response.

Quantitative titrations of the perfusion fluid, by means of a specific precipitating serum, show no recognizable changes in the amount of protein as a result of the repeated passages through the lungs.

The titrations therefore furnish no support, either for the sessile receptor hypothesis of Ehrlich, or for the protein-destruction theory of Vaughan.