

Understanding the Test Result: Background and Interpretation

Background:

Blood basophils contain histamine, which can be released upon encounter with an allergen if the basophils are sensitized with allergen-specific IgE. By subjecting blood samples from patients to the suspected allergen in a test tube, the basophil histamine release assay (BHRA) mimics the allergic response and is thus termed the “allergen-induced basophil histamine release assay” (or simply a-BHRA). The response to an allergen differs between patients and research has shown a correlation between the lowest concentration of allergen that triggers histamine release in the laboratory and the patient’s actual threshold for reacting to that allergen (as determined by clinical food challenge). In other words, the more sensitive the basophils are in the test tube, the more likely the patient is to react to small amounts of the allergen in real life. This makes the assay a valuable tool for assessing the relative risk and severity of an allergic response.

Test Principle:

In the a-BHRA, each allergen is tested in six different concentrations, ranging from very low to very high. The output of the assay is the amount of histamine release by the basophils at each allergen concentration. To standardize results across different allergens, the a-BHRA response is expressed in four classes.

Classification:

- *Class 0*: No histamine release at any of the tested allergen concentrations.
- *Class 1*: Histamine release observed only at the two highest allergen concentrations, indicating mild allergic response.
- *Class 2*: Histamine release demonstrated at two intermediate allergen concentrations, corresponding to a moderate allergic response.
- *Class 3*: Histamine release triggered by the two lowest allergen concentrations, suggesting a high degree of allergy and potentially severe reactions to the allergen.