

2. ALLERGY TESTING

Testing Methods for Allergen Identification

After a diagnosis of atopic dermatitis has been made, the next step in allergy management is to identify causative allergens through allergy testing. Identification of allergic triggers helps veterinarians and owners to devise avoidance strategies where possible, and more often, to select appropriate allergens for immunotherapy treatment. Two types of allergy tests are available.

In vitro Serum IgE Testing:

Serum IgE testing directly measures allergen-specific IgE circulating in the serum of an allergic animal. There are a number of practical advantages offered by serum IgE testing:

- There is no steroid or antihistamine interference.
- A single blood draw is convenient.
- Food allergy testing is available.
- It is less stressful for the patient; no clipping or sedation is necessary.
- Co-existing skin pathologies do not affect test results.
- Testing has a lower cost and widespread availability.
- Test results are reproducible, and not subjective.

Intradermal Skin Testing (IDST):

Skin testing involves injecting small amounts of test allergens intradermally into a patient's skin, in order to check for a hypersensitivity reaction. If the patient is allergic to the injected allergen, a local IgE-mediated immediate hypersensitivity reaction (involving histamine release from tissue-bound mast cells) will occur near the injection site, causing redness and swelling ("wheal and flare reaction"). Practical considerations associated with intradermal skin testing include:

- Steroid therapy must be withdrawn for a minimum of six weeks.
- Antihistamine therapy must be withdrawn for a minimum of two weeks.
- Interpretation is subjective; performance and evaluation of the test is highly operator-dependent.
- Patient stress; animal must be sedated and clipped.
- Co-existing skin pathologies or drug therapy may interfere with or preclude testing.
- Small but significant risk of adverse reaction exists, including anaphylaxis.
- Unreliable in cats, because wheals are not easily visible to the naked eye. Results must be read under a UV light after cat is injected with fluorescein.²⁵
- High level of training/expertise required to perform IDST limits availability of this test method.



Skin test injection sites

A valid metric by which to judge the accuracies of IDST and serum IgE testing is to evaluate the effectiveness of immunotherapy treatment. Several studies have documented that there is no significant difference in response rates to immunotherapy, regardless of whether intradermal skin testing or an IgE serum test was used to select allergens for immunotherapy treatment.^{26, 27, 28}

IDST AND SERUM IgE TESTING PERFORM EQUALLY WELL TO IDENTIFY ALLERGENS FOR IMMUNOTHERAPY TREATMENT

“There was no difference in response to hyposensitization whether based on IDST or ELISA results.”

Zur, G. *et. al.* 2002. *Veterinary Dermatology* 13: 103-111.²⁶

“No significant differences were found in response to immunotherapy during the follow-up period between allergen selection methods (IDST or ELISA). These results indicate the value of serologic tests as an aid to identifying an allergen solution for immunotherapy.”

Park, S.J. *et.al.* 2000. *J. Vet. Med. Sci.* 62: 983-988²⁷

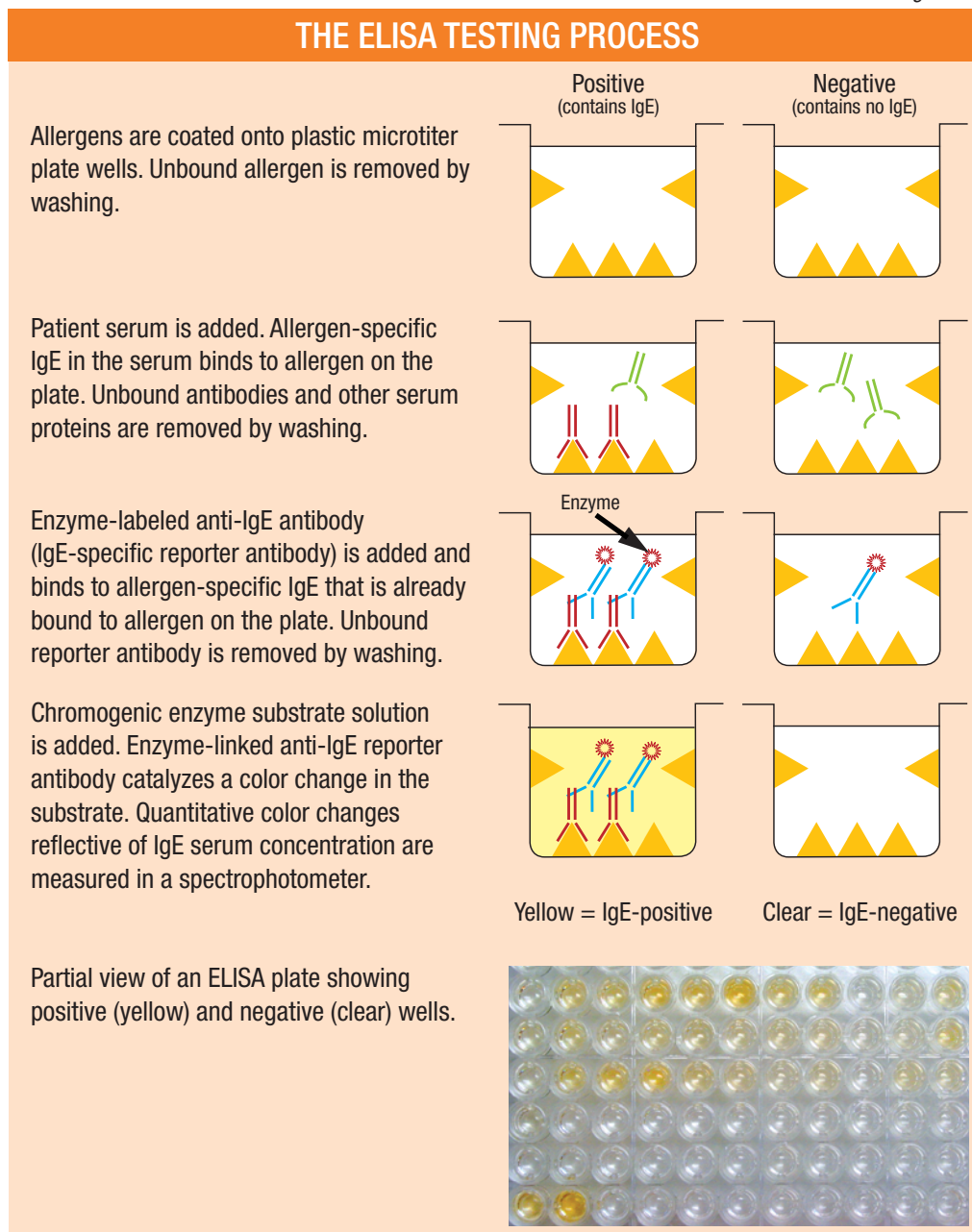
ELISA Testing

Bio-Medical Services performs *in vitro* serum IgE testing for allergen identification. The test format is known by the acronym ELISA, or Enzyme-Linked ImmunoSorbent Assay.

- In an ELISA, allergen proteins are bound to a solid support, which is a 96-well plastic microtiter assay plate. The combination of an allergen bound to a plastic assay well is the immunosorbent component of the assay.
- Each assay well contains a single allergen for testing. Patient serum is added to allergens bound to assay wells.
- After incubation, the serum is washed away. Left behind in the assay well is allergen-specific IgE, which is bound to the allergen that was already in the well before the serum was added.

An enzyme-labeled, IgE-specific reporter antibody is then added to the assay well, followed by a chromogenic (changes color) enzyme substrate solution. If IgE is present in the assay well, the substrate changes color, which can be measured in a spectrophotometer. Bio-Medical Services uses a highly purified, affinity-pure polyclonal anti-IgE antibody as the reporter antibody. Our test is highly reproducible, sensitive and accurate.

Figure 2.1



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