

## LeukoFunction Test

### *An Ex-Vivo Blood Challenge Test for Allergy*

**Test Name:** LeukoFunction Test  
**Test Code(s):** See Individual Allergens  
**CPT Code:** 86352 for each allergen

**Test Name:** Leukocyte Activation Test  
**Test Code:** 511350  
**CPT Code:** 86352

**Clinical Utility:** The LeukoFunction test may be useful with patients who have a suggestive history and for whom skin testing and/or in vitro specific IgE testing is not appropriate or available.

#### Specimen Requirement:

- **Ensure drawing laboratory has ordered and received shipping kit from IBT Laboratories.**
- Blood (6-8 mL) must be collected in EDTA venipuncture tubes and **shipped with cold packs priority overnight**. Heparin and citric acid are not acceptable anticoagulants. (See Test Code/ Packaging Instructions sheet for shipping requirements).
- Sample must arrive at IBT Laboratories within 24 hours of blood draw.
- It is recommended that the patient avoid systemically administered allergen drugs such as corticosteroids or chromoglycic acid and indomethacin for at least 24 hours prior to blood draw.
- Samples are accepted Monday through Friday.

**Background For Test Application:** Adverse drug reactions are a common problem faced by allergists today. These reactions may be IgE-mediated allergic responses or pseudo-allergic reactions that are not IgE-mediated. Blood basophils generate sulfidoleukotrienes (sLT) and histamine in response to allergens in an IgE-dependent manner<sup>1</sup>. However, the generation of de novo sLT by challenged basophils or mast cells is not always paralleled by the release of histamine<sup>2</sup>. Additionally sLT may be generated by other cells involved in pseudo-allergic reactions<sup>3,4</sup>.

**Interpretative Comments:** A positive result indicates that the antigen was reactive ex vivo and could be clinically reactive in the patient. No challenge studies have been performed to determine the predictive value of a positive result. Caution must be exercised with regard to patients that show non-responsiveness because an antigen may still cause a clinically significant adverse reaction in the patient.

#### Method:

(1) **Isolation of leukocytes:** Dextran is added to the patient blood to increase viscosity. Following a brief incubation the red blood cells sediment and the leukocytes and thrombocytes stay in the plasma. The plasma is removed and a centrifugation step separates the thrombocytes and the leukocytes.

(2) **Cell stimulation:** Isolated leukocytes are incubated with the allergen(s) of choice, Anti-FcεR (Leukocyte Activation Test) and negative control. Following a brief stimulation the supernatant containing any released sLT is removed.

(3) **sLT Determination:** The level of sLT released, in response to the allergen(s), Anti-FcεR and negative control, is quantitated in a validated sLT ELISA. The ELISA reacts with LTC<sub>4</sub>, LTD<sub>4</sub>, and LTE<sub>4</sub>. IBT Laboratories determined the performance characteristics of this test. It has not been approved or cleared by the FDA.

**Report Format:** sLT released into culture is reported in pg/mL. The sLT to both the allergen and the positive control are reported. The results are compared to reference values determined from blood from non-allergic individuals.

#### Antigen List:

<b>Analgesics:</b>	<b>Antibiotics:</b>	<b>Anesthetics:</b>
Acetaminophen	Cefamandole	Atracurium
Diclofenac	Cefazolin	Lidocaine
Dipyron/ Metamizole	Cephalosporin C	Mivacurium
Ibuprofen	Ciprofloxacin	Pancuronium
Indomethacin	Penicillin; Benzylpenicil- loyl-polylysine	Propofol
Lys-Aspirin	Penicillin; minor det. mix	Rocuronium
Mefenamic Acid	Sulfamethoxazole	Suxamethonium
Phenylbutazone	Tetracycline	Vecuronium
Propyphenazone	Trimethoprim	

#### References:

- (1) Mita, H et. al. 1986. Allergen-induced histamine release and immune-reactive leukotriene C<sub>4</sub> generation from leukocytes in mite sensitive asthmatic patients. *Prostaglandins* 31:869-886.
- (2) Maly, FE et. al. 1994. Dissociation of mononuclear cell sulfide-leukotriene generation and whole blood histamine release in insect venom allergics. Abstract presented at Annual meeting of Swiss Association of Allergologists.
- (3) Christie, PE et. al. 1995. Urinary leukotriene E<sub>4</sub> concentrations increase after aspirin challenge in aspirin-sensitive asthmatic subjects. *Am Rev Respir Dis* 143:1025-1029.
- (4) Czech, W et. al. 1995. Release of sulfidoleukotrienes in vitro: Its relevance in the diagnosis of pseudoallergy to acetylsalicylic acid. *Inflamm Res* 44:291-295.

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