

DEPARTMENT OF INTERNAL MEDICINE
HACKENSACK UNIVERSITY MEDICAL CENTER
SPECIAL DIAGNOSTIC IMMUNOLOGY LABORATORY
30 Prospect Avenue
Hackensack, NJ 07601
551-996-4965

Director: Thomas A. Selvaggi M.D.

MANUAL FOR COLLECTION AND HANDLING OF
SPECIMENS

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HACKENSACK UNIVERSITY MEDICAL CENTER
SPECIAL DIAGNOSTIC IMMUNOLOGY LABORATORY
551-996-4965

Thomas A. Selvaggi, M.D., Medical Director

PROCEDURE DIRECTORY

- 1. Allergy Testing Panels (Regional Allergy Panel, Phadia Panels) and Individual Allergens (Specific IgEs)**
- 2. Bronchoalveolar Lavage**
- 3. Granulocyte Respiratory Burst**
- 4. HLA –B27**
- 5. Immunoglobulin E (Total IgE)**
- 6. Leukemia Immunophenotyping Profile**
- 7. Lymphocyte Enumeration, T Cell: CD4, CD8**
- 8. Lymphocyte Enumeration, T, B and NK Subsets**
- 9. Lymphoma Immunophenotyping Profile**
- 10. Myeloperoxidase Staining**
- 11. PNH (Paroxysmal Nocturnal Hemoglobinuria)**
- 12. Sezary Panel**
- 13. Stem Cell Enumeration Assay**

*Hackensack University Medical Center
Special Diagnostic Immunology Laboratory
551-996-4965*

Specimen Requirements
ALLERGY TESTING PANELS and INDIVIDUAL ALLERGENS
(Specific IgE, formerly RAST)

CPT Codes:	82785, 86003, 86005
Component:	Method:
Allergen Specific IgE	UniCap Fluoroenzyme Immunoassay
Specimen Requirements – <i>Adult</i>:	4 ml serum; A minimum of 0.1 ml of serum is required per allergen. Transport: ambient (room), refrigerated, frozen.
Specimen Requirements – <i>Pediatric</i>:	2 ml serum; A minimum of 0.1 ml of serum is required per allergen. Transport: ambient (room), refrigerated, frozen.
	Specimens must be labeled with patient name, medical record number or accession number, date of birth and date and time of procurement.
Turnaround Time:	1-3 days
Set-up Schedule:	Monday thru Friday, 8:30 AM – 5:30 PM
Notes:	Refer to the list of individual allergens. Call the Special Diagnostic Immunology Laboratory for assistance at 551-996-4965.

Reference Ranges:	Concentration (kUA/l)	Class	Interpretation
	0.35	0	Negative
	0.35 – 0.69	1	Equivocal
	0.70 – 3.49	2	Positive
	3.50 – 17.49	3	Positive
	17.5 – 49	4	Strongly Positive
	50.0 – 99	5	Strongly Positive
	>100	6	Strongly Positive

ALLERGY PANELS

The physician is encouraged to order clinically relevant individual allergens if any of the components of the following panels are not relevant. *Please see the lists of individual allergens following the panels.*

1. REGIONAL ALLERGY PANEL (Cerner mnemonic: *REG ALLERG*)

This clinician-designed panel reflects the predominant allergens in the Northern New Jersey area. In general, it assists clinicians in the exploration of allergenic triggers in persons with atopic diseases such as rhinitis, conjunctivitis and asthma. There are 19 components to the Regional Allergy Panel, as well as a Total IgE assay performed.

Alternaria alternate	(m6)
Aspergillus fumigatus	(m3)
Birch	(t3)
Box-elder/Maple	(t1)
Cat	(e1)
Cladosporium herbarum	(m2)
Cockroach	(i6)
Dermatophagoides farinae	(d2)
Dog	(e2)
Elm	(t8)
Epicoccum	(m14)
Lamb's quarters/Goosefoot	(w10)
Meadow grass/Kentucky blue	(g8)
Mugwort	(w6)
Oak	(t7)
Plantain (English)	(w9)
Ragweed	(w1)
Sheep sorrel	(w18)
White Ash	(t15)

2. RESPIRATORY DISEASE PROFILE (Cerner mnemonic: *RESP PROF*)

A commercially-suggested panel used to evaluate for allergen sensitivity in persons with respiratory disease. There are 16 components to the Respiratory Disease Profile, as well as a Total IgE assay performed.

Cat dander	(e1)
Cockroach	(i6)
Cocksfoot, Orchard grass	(g3)

RESPIRATORY DISEASE PROFILE (RESP PROF) cont'd:

Common Ragweed	(w1)
Common Silver Birch	(t3)
Dog dander	(e5)
Elm	(t8)
Goosefoot, Lamb's quarters	(w10)
House dust mite (<i>D. farinae</i>)	(d2)
House dust mite (<i>D. pteronyssinus</i>)	(d1)
Maple, Box-elder	(t1)
Mold (<i>Cladosporium herbarum</i>)	(m2)
Mold (<i>Alternaria alternata</i>)	(m6)
Mold (<i>Aspergillus fumigatus</i>)	(m3)
Oak	(t7)
White Ash	(t15)
Total IgE	

3. CHILDHOOD ALLERGY MARCH PROFILE (Cerner mnemonic: **CHLD MARCH)**

A commercially-suggested panel used to evaluate allergen sensitivity in atopic children. There are 11 components to the Childhood Allergy March Profile, as well as a Total IgE assay performed.

Cat dander	(e1)
Cockroach	(i6)
Dog dander	(e5)
Egg white	(f1)
Fish, cod	(f3)
House dust mite (<i>D. pteronyssinus</i>)	(d2)
Milk	(f2)
Mold (<i>A. alternata</i>)	(m6)
Peanut	(f13)
Soybean	(f14)
Wheat	(f4)
Total IgE	

4. FOOD ALLERGY PROFILE (Cerner mnemonic: *FOOD PROF*)

A commercially-suggested panel used to evaluate persons with food hypersensitivity, anaphylaxis or atopic dermatitis. There are 11 components to the Food Allergy Profile, as well as a Total IgE assay performed.

Clam	(f207)
Corn (Maize)	(f8)
Egg white	(f1)
Fish, cod	(f3)
Milk	(f2)
Peanut	(f13)
Scallop	(f338)
Shrimp	(f24)
Soybean	(f14)
Walnut	(f256)
Wheat	(f4)
Total IgE	

SPECIFIC IgE – INDIVIDUAL ALLERGENS

The assay for *Specific IgE* is offered for a wide variety of allergens, using the Phadia UniCap fluoroenzyme immunoassay.

Please consult the following lists for specific allergens.

If other allergens are desired and not listed below, please contact the Special Diagnostic Immunology Laboratory at 551-996-4965 for availability. Please indicate individual allergens on the requisition form.

Note* 0.1 ml serum is required per individual allergen.

In-House Allergens

Trees

American Beech	(t5)
Ash	(t15)
Birch, Common Silver	(t3)
Box Elder	(t1)
Cottonwood	(t14)
Elm	(t8)
Grey Alder	(t2)
Hazel	(t4)
Italian, funeral Cypress	(t23)
Japanese Cedar	(t17)
Linden	(t208)
Maple Leaf	(t11)
Mountain Juniper	(t6)
Mulberry	(t70)
Oak	(t7)
Pecan, Hickory	(t22)
Walnut	(t10)
White Pine	(t16)

Weeds

Cocklebur	(w13)
Common Pigweed	(w14)
Common Ragweed	(w1)
Dandelion	(w8)
English Plantain	(w9)
Giant Ragweed	(w3)
Goldenrod	(w12)
Lamb's quarters	(w10)
Mugwort	(w6)
Nettle	(w20)
Rough Marshelder	(w16)
Saltwort/Russian Thistle	(w11)
Sheep Sorrel	(w18)
Western Ragweed	(w2)

Grasses

Bermuda Grass	(g2)
Canary Grass	(g71)
Cocksfoot	(g3)
Common Reed	(g7)
Johnson Grass	(g10)
Kentucky Blue	(g8)
Meadow fescue	(g4)
Red top	(g9)
Rye	(g5)
Sweet Vernal Grass	(g1)
Timothy	(g6)
Velvet Grass	(g13)

Non-Seasonal Inhalants (In-House)

Animal Epidermal

Budgerigar Droppings	(e77)
Budgerigar Feathers	(e78)
Canary Feathers	(e201)
Cat Dander	(e1)
Chicken Feathers	(e85)
Dog Dander	(e5)
Dog Epithelium	(e2)
Duck Feathers	(e86)
Goose Feathers	(e70)
Guinea Pig Epithelium	(e6)
Hamster Epithelium	(e84)
Horse Dander	(e3)
Mouse Epithelium	(e71)
Mouse Serum Proteins	(e76)
Mouse Urine Proteins	(e72)
Parrot Feathers	(e213)
Pigeon Droppings	(e7)
Rabbit Epithelium	(e82)
Rat Epithelium	(e73)
Rat Serum Proteins	(e75)
Rat Urine Proteins	(e74)
Turkey Feathers	(e89)
*Goose,Chicken,Duck,Turkey feathers	(ex71)

Molds

Alternaria alternate (A. tenuis)	(m6)
Aspergillus fumigatus	(m3)
Aspergillus niger	(m207)
Aureobasidium pullulans	(m12)
Candida albicans	(m5)
Cladosporium herbarum	(m2)
Curvularia lunata	(m16)
Epicoccum Purpurascens	(m14)
Fusarium moniliforme	(m9)
Helminthosporium halodes	(m8)
Malassezia furfur	(m70)
Mucor racemosus	(m4)
Penicillium notatum	(m1)
Rhizopus nigricans	(m11)
Stemphylium botryosum	(m10)
Trichophyton rubrum	(m205)

Dust Mites/House Dust

Dermatophagoides farina	(d2)
Dermatophagoides pteronyssinus	(d1)
House dust (Greer Labs, Inc.)	(h1)
House dust (Hollister-Stier Labs)	(h2)

Insect Venom Allergens

Honey Bee	(i1)
Hornet, White Face	(i2)
Hornet, Yellow	(i5)
Wasp, Paper	(i4)
Yellow Jacket	(i3)

Insects

Cockroach	(i6)
Fire Ant	(i70)
Horse Fly	(i201)
Mosquito	(i71)

Occupational Allergens

Green Coffee Beans	(k70)
Ispaghula	(k72)
Latex	(k82)
Sunflower Seed	(k84)

Drugs

Amoxicilloyl	(c6)
Ampicilloyl	(c5)
Gelatin	(c74)
Insulin, Human	(c73)
Penicilloyl G	(c1)
Penicilloyl V	(c2)

Foods**Dairy/Eggs**

Casein	(f78)
Cheese (cheddar)	(f81)
Cheese (mold type)	(f82)
Egg (whole)	(f245)
Egg white	(f1)
Egg yolk	(f75)
Gluten	(f79)
Milk (cow's)	(f2)

Grains

Barley	(f6)
Oat	(f7)
Rice	(f9)
Rye	(f5)
Wheat	(f4)

Fish

Chub Mackerel	(f50)
Cod	(f3)
Herring	(f205)
Salmon	(f41)
Sardine	(f61)
Trout	(f204)
Tuna	(f40)

Crustaceans/Mollusks

Blue Mussel	(f37)
Clam	(f207)
Crab	(f23)
Lobster	(f80)
Oyster	(f290)
Scallop	(f338)
Shrimp	(f24)

Herbs/Spices

Garlic	(f47)
Mustard	(f89)
Paprika	(f218)
Parsley	(f86)
Pepper (black)	(f280)

Fruits/Vegetables

Apple	(f49)
Apricot	(f237)
Avocado	(f96)
Banana	(f92)
Broccoli	(f260)
Cabbage	(f216)
Carrot	(f31)
Celery	(f85)
Cherry	(f242)
Corn	(f8)
Cucumber	(f244)
Grape	(f259)
Grapefruit	(f209)
Kiwi	(f84)
Lemon	(f208)
Melon	(f87)
Onion	(f48)
Orange	(f33)
Peach	(f95)
Pear	(f94)
Pineapple	(f210)
Plum	(f255)
Potato (Sweet)	(f54)
Potato	(f35)
Pumpkin	(f225)
Soybean	(f14)
Spinach	(f214)
Strawberry	(f44)
Tomato	(f25)

Nuts/Seeds

Almond	(f20)
Brazil nut	(f18)
Cashew	(f202)
Chestnut	(f299)
Coconut	(f36)
Hazelnut	(f17)
Peanut	(f13)
Pecan	(f201)
Pistachio	(f203)
Sesame seed	(f10)
Walnut	(f256)

Mammal/Fowl

Beef	(f27)
Chicken	(f83)
Mutton	(f88)
Pork	(f26)
Turkey	(f284)

Other

Chocolate	(f93)
Ovalbumin	(f232)
White Bean	(f15)
Yeast	(f45)

Allergens for Send-Out to Mayo Labs

Acacia
Alpha-Amylase
American Cheese
Anchovy
Bahia Grass
Barley Grass
Basil
Black Bean
Blackberry
Blackeyed Pea
Blueberry
Blue Cheese
Brome Grass
Brussel Sprouts
Botrytis Cinerea
Buckwheat
Budgerigar Serum proteins
Bumble Bee
Cantaloupe
Castor Bean
Catfish
Cauliflower
Cayenne Pepper
Cephalosporin
Chestnut Tree
Chili Pepper
Chinchilla
Chymopapain
Cilantro
Cinnamon
Clove
Cockroach, American
Common Reed Grass
Coriander
Cotton Seed
Cow Epithelium
Cranberry
Cultivated Oat Grass
Cultivated Wheat Grass
Date
Deer Fly
Duck Meat

Mayo Labs Allergen Send-Outs cont'd

Eel
Eggplant
Ethylene Oxide
Eucalyptus
False Ragweed
Fennel Seed
Ferret Epithelium
Ficus Spp
Firebush, Kochia
Flaxseed
Flounder
Formaldehyde
Fruit Fly
Ginger
Goat's Milk
Golden Rod
Green Pepper
Guava
Haddock
Halibut
Hickory White
Honey
Honeydew Melon
Hops
Horseradish
Isocyanate HDI
Isocyanate MDI
Isocyanate TDI
Jalapeño Pepper
Kidney Bean, Red
Lamb Meat
Lima Bean
Lime
Macadamia Nut
Maize, corn (Grass)
Marguerite, Ox-eye Daisy
Meadow Foxtail
Melaleuca
Mint
Mozzarella Cheese
Mushroom
Nectarine
Nutmeg
Oregano
Papaya
Parietaria Judaica
Parietaria Officinalis
Parmesan Cheese

Mayo Labs Allergen Send-Outs cont'd

Parsnip
Passion Fruit
Phoma Betae
Pine Nut
Pomegranate
Poppy Seed
Queen Palm
Quinolones
Rapeseed
Raspberry
Red Cedar
Red Maple
Red Pepper
Rhubarb
Romano Cheese
Sage
Scale, Lens
Sole
Spruce Tree
Squash
String Bean
Sulfamethoxazol
Swiss Cheese
Swordfish
Tangerine
Tapioca
Tarragon
Tea
Tetracycline
Thyme
Tilapia
Tricoderma Viride
Trimellitic Anhydride
Turnip
Vanilla Bean
Watermelon
Whey
Whitefish
Wild Rye Grass
Wormwood
Wool Sheep
Zucchini

Allergens for Send-Out to LabCorp:

Chickory Root	#060137
Chloramin	#615021
Coffee	#068270
Green Olive	#060350
Rabbit Meat	#060459
Silk Waste	#804037

HACKENSACK UNIVERSITY MEDICAL CENTER
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Specimen Requirements

BRONCHOALVEOLAR LAVAGE

CPT Code: 88184, 88185

Components:

WBC differential and Counts
% CD3+ (T cells)
% CD2+ (B cells)
% CD20+ (T cells)
% CD3+CD4+ (Helper/inducer)
% CD3+CD8+ (Cytotoxic/suppressor)
% CD3-CD19+ (earliest B cells)
CD4/CD8 Ratio

Methods:

Quick Prep
Flow cytometry
Flow cytometry
Flow cytometry
Flow cytometry
Flow cytometry
Flow cytometry
Calculation

Patient Preparation:

As per orders for bronchoscopy

Bronchoscopist, please note:

Five 20 ml aliquots are instilled in each segment to be assayed. The first installation and aspiration is separated from the subsequent four.
20% of the first installation should be recovered.
40% of the second installation should be recovered.
70% of the third, fourth and fifth installations should be recovered.
The second through fifth specimens are combined.

Specimen requirements – Adult:

1. Minimum of 4 ml in sterile container marked “Bronchial lavage – first aspiration”.
2. Minimum of 50 ml in sterile container marked “Alveolar lavage - aspiration 2 – 5”.
3. 5 ml whole blood collected in EDTA tube at room temperature for a peripheral blood B&T Lymphocyte Enumeration.
A peripheral WBC count and differential obtained at time of bronchoscopy.

Note*: Specimens must be received within 12 hours of collection.

Specimens must be labeled with specimen source, patient’s name, medical record number or accession number, date of birth and date and time of procurement.

Specimen Transport:

Do not refrigerate or freeze. Transport at room temperature.

Bronchoalveolar Lavage Specimen Requirements cont'd

Set-up Schedule: Monday – Friday, 8:30 AM – 5:30 PM
Not available on weekends.

Turnaround Time: 1 – 2 days

Lymphocyte Analysis (Reference): T-cells 70%
B-cells 1 – 5%
CD4:CD8 T-cell ratio 1.5

Reference Ranges:

	<i>Smoker without chronic bronchitis</i>		<i>Non-smoker</i>	
	<i>Bronchial</i>	<i>Alveolar</i>	<i>Bronchial</i>	<i>Alveolar</i>
Total Cells x 10⁶	3.6 +/- 0.6	104.3 +/- 9.4	4.1 +/- 0.6	28 +/- 3.5
Macrophage %	56 +/- 4	89 +/- 2	63 +/- 3	79 +/- 3
Neutrophil %	21 +/- 3	6 +/- 1	10 +/- 1	3 +/- 1
Eosinophil %	<1	<1	<1	<1
Lymphocyte %	<1	2 +/- 1	3 +/- 1	13 +/- 2
Ciliated cells %	17 +/- 3	2 +/- 1	19 +/- 2	4 +/- 1
Squamous cells %	5 +/- 3	1	5 +/- 3	<1

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Specimen Requirements

GRANULOCYTE RESPIRATORY BURST

CPT Code: 88184

Components: **Method:**

Flow Cytometry

Stimulation Index: Measurement of rhodamine fluorescence after the oxidation from 123 dihydrorhodamine upon stimulation of granulocytes with phorbol myristate acetate (PMA).

**Note: This assay must be scheduled in advance with the Special Diagnostic Immunology Laboratory at 551-996-4965.*

Specimen requirements: **Adult:** Minimum of 6.0 ml of peripheral blood collected in one plastic lithium heparin anticoagulant vacutainer tube.

Pediatric: Minimum of 4.0 ml of peripheral blood collected in one plastic lithium heparin anticoagulant vacutainer tube.

Notes: 1. Plastic lithium heparin tubes are available through the Special Diagnostic Immunology Laboratory, 551-996-4965.

2. Normal control specimen must be obtained at the same time patient specimen is obtained. Please call the Special Diagnostic Immunology Laboratory for handling and mailing instructions.

3. Results from a CBC with differential, drawn at the same time as the lithium heparin tubes, should be provided with the sample. ***Alternatively,*** send an additional purple top tube for CBC with differential to be performed in Pathology.

Granulocyte Respiratory Burst Specimen Requirements cont'd

Specimen Transport:

Specimens **must not be subject to temperature extremes**; they must be transported at room temperature.

Specimens **must be received within 24 hours of procurement.**

Specimens must be labeled with patient's name, medical record number or accession number, date of birth, and date and time of procurement.

Set-up Schedule:

Monday – Friday, 8:30 AM – 5:30 PM
Not available on weekends.

Normal Range:

A **stimulation index** range of **40 - 177**, or fluorescence pattern that parallels normal control.

Note:

Abnormal results will automatically reflex to Myeloperoxidase staining, for an additional charge (CPT Code 88184).

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Specimen Requirements

HUMAN LEUKOCYTE ANTIGEN – HLA-B27 TYPING

CPT Code:	88184
Componets:	Method:
HLA-B27	Flow Cytometry
Specimen requirements – <i>Adult</i>:	10 ml Whole blood; (yellow top tube) ACD Solution B of trisodium citrate, 13.2 g/L; citric acid, 4.8 g/L; and dextrose 14.7 g/L, 0.4 mL.
Specimen requirements – <i>Pediatric</i>:	3 ml Whole blood; (yellow top tube) ACD Solution B of trisodium citrate, 13.2 g/L; citric acid, 4.8 g/L; and dextrose 14.7 g/L, 0.4mL.
Collection Notes:	<p>Do <u>not</u> refrigerate or freeze. Transport at room temperature. Include race and patient’s diagnosis.</p> <p>Specimens will be rejected if determined to be subject to temperature extremes, clotted, hemolysed or agglutinated.</p> <p>Specimens will be rejected if received greater than 24 hours past draw time.</p> <p>Specimens must be labeled with patient’s name, medical record number or accession number, date of birth and date and time of procurement.</p>
Set-up Schedule:	Monday – Friday, 8:30AM – 5:30PM Not available on weekends.
Turnaround Time:	1 day
Reference Values:	<i>HLA-B27 percent positive:</i> African-American, 3-4% Caucasian, 6-8% Asian, 1%

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Specimen Requirements

IMMUNOGLOBULIN E (TOTAL IgE)

CPT Code:	82785
Component:	Method:
Total IgE	UniCap Fluoroenzyme Immunoassay
Specimen Requirements – <i>Adult</i>:	1 ml serum; A minimum of 0.1 ml of serum is required. Transport: ambient (room), refrigerated or frozen.
Specimen Requirements – <i>Pediatric</i>:	1 ml serum; A minimum of 0.1 ml of serum is required. Transport: ambient (room), refrigerated or frozen. Specimens must be labeled with patient’s name, medical record number or accession number, date of birth and date and time of procurement.
Turnaround Time:	1- 3 days
Set-up Schedule:	Monday – Friday, 8:30 AM – 5:30 PM
Reference Range:	0 to 233 kU/L

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Specimen Requirements

LEUKEMIA IMMUNOPHENOTYPING PROFILE

CPT Code: **88184, 88185**

Components: **Method:**

Includes flow cytometric analysis with a panel of lymphocyte- and/or myeloid-associated surface markers. The appropriate panel chosen is based on clinical information, specimen type, cellular characteristics, and morphologic review.

Flow Cytometry

Pathology consultation (CPT 88325)

Specimen requirements:

Bone Marrow:

A **minimum of 1-2 ml.** collected aseptically in a syringe containing heparin. Bone marrow may also be collected in a sodium heparin vacutainer tube.

Peripheral Blood:

A minimum of one sodium heparin tube (10 ml). EDTA tube may suffice if specimen is less than 30 hours old.

Bone marrow and/or peripheral blood smear prepared on glass slide should accompany the specimen.

Collection Notes:

All specimens must be transported at room temperature.

Indicate name and telephone number of the ordering physician and brief history, including cytologic and morphologic characteristics to obtain fully relevant consultation.

Specimens must not be subject to temperature extremes, clotted, hemolyzed or agglutinated.

Specimens must be received within 12 hours of procurement.

Specimens must be labeled with specimen source, patient's name, medical record number or accession number, date of birth, and date and time of procurement in the presence of the patient (for e.g. bedside).

Turnaround Time:

1-4 days

Results released by hematopathologist after morphologic review.

Leukemia Immunophenotyping Specimen Requirements cont'd

Set-up Schedule:

Monday – Friday, 8:30 AM – 5:30 PM
Please call **551-996-4965** for night and weekend STAT specimens.

Normal Values:

Cell phenotype and cell scatter characteristics consistent with multilineage maturation, without an elevated uniform blast population.

Leukemia Monoclonal Antibody List:

T Cells

CD1a
CD2
CD3
CD4
CD5
CD7
CD8
T-Cell receptor (alpha/beta)
T-Cell receptor (gamma/delta)

Myeloid / Monocytes

CD13 Myeloid cells
CD14 Monocytes
CD15 Granulocyte associated antigen
CD16 Fe Gamma receptor III
CD33 Myeloid cells

Plasma Cells

CD38
CD138 Plasma cells
CD28
CD27

Miscellaneous

CD10 CALLA
CD11b C3bi receptor
CD11c Protein 150, 95 (HCL)
CD25 Interleukin 2 receptor (HCL)
CD30 Ki-1 Antigen
CD34 Hematopoietic progenitor cells
HLA-DR
CD71 Transferrin receptor
CD103 Mucosal lymphocyte antigen (HCL)
Bcl-2
Glycophorin-A Red blood cells

B Cells

CD5 (B cell subset)
CD19
CD20
CD22
CD23
FMC7
Kappa Light Chains
Lambda Light Chains
IgA, IgD, IgG, IgM Heavy Chains

NK Cells

CD56

Leukocytes

CD45

Platelets

CD41 Platelet glycoprotein IIb / IIIa
CD42b Platelet glycoprotein Ib
CD61 Platelet glycoprotein IIIa

Miscellaneous

CD79a B Lymphocytes
CD117 Myeloid blasts
CD24 Myeloid cells
CD64 Myeloid cells
CD52 T cells
Myeloperoxidase
Terminal Deoxynucleotidyl Transferase (TdT)

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Specimen Requirements

LYMPHOCYTE ENUMERATION, T CELL

CPT Code: 86359, 86360

Components:	Method:
Absolute CD3	Calculation
Absolute CD4	Calculation
Absolute CD8	Calculation
% CD3+ (mature T cells)	Flow cytometry
% CD3+CD4+ (Helper/inducer)	Flow cytometry
% CD3+CD8+ (Cytotoxic/suppressor)	Flow cytometry
CD4:CD8 ratio	Calculation
WBC with Differential (required)	See Hematology

Specimen requirements – *Adult*: 5.0 ml (minimum 2.0 ml) Whole blood (EDTA)
Ambient (room) temperature

Specimen requirements – *Child*: 1 – 3 ml Whole blood (EDTA)
Ambient (room) temperature

Collection Notes: **Do not refrigerate or freeze.** Transport at room temperature.
*Specimens collected in 10ml EDTA tubes (large lavender) will be rejected.

Specimen Rejection: Specimens must not be subject to temperature extremes, clotted, hemolysed or agglutinated.

Specimens must be received within 30 hours of collection.

Specimens must be labeled with patient's name, medical record number or accession number, date of birth and date and time of procurement.

Set-up Schedule: Monday – Friday, 8:30AM – 5:30PM
Not available on weekends.

Turnaround Time: 1 day

Reference Range: **Age-appropriate reference ranges are supplied with results.**

HACKENSACK UNIVERSITY MEDICAL CENTER
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Specimen Requirements

LYMPHOCYTE ENUMERATION, T, B and NK SUBSETS

CPT Code:	86359, 86360, 86064, 86379
Components:	Method:
Absolute CD3	Calculation
Absolute CD4	Calculation
Absolute CD8	Calculation
Absolute CD19	Calculation
Absolute CD56	Calculation
% CD3 (mature T cells)	Flow cytometry
% CD3+CD4+ (Helper/inducer T cells)	Flow cytometry
% CD3+CD8+ (Cytotoxic/suppressor)	Flow cytometry
% CD3-CD19+ (earliest B cells)	Flow cytometry
% CD3-CD56+ (Natural killer cells)	Flow cytometry
CD4:CD8 ratio	Calculation
WBC + Differential (required)	See Hematology
Patient Preparation:	None
Specimen Requirements – <i>Adult</i>:	5.0 ml (minimum 2.0 ml) Whole blood (EDTA) Ambient (room) temperature
Specimen Requirements – <i>Child</i>:	1 ml – 3 ml Whole blood (EDTA) Ambient (room) temperature
Collection Notes:	Do <u>not</u> refrigerate or freeze. Transport at room temperature. *Specimens collected in 10ml EDTA tubes (large lavender) will be rejected. Specimens must not be subject to temperature extremes, clotted, hemolysed or agglutinated. Specimens must be received within 30 hours of collection. Specimens must be labeled with patient’s name, medical record number and/or accession number, date of birth and date and time of procurement.
Set-up Schedule:	Monday – Friday, 8:30 AM – 5:30 PM Not available on weekends.
Turnaround Time:	1 day
Reference Range:	Age-appropriate reference ranges are supplied with results.

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Specimen Requirements

LYMPHOMA IMMUNOPHENOTYPING PROFILE

CPT Code: 88184, 88185

Components: **Method:**

Includes flow cytometric analysis with a panel of lymphocyte-associated surfacemarkers. The appropriate panel chosen is based on clinical information, specimen type, cellular characteristics, and morphologic review.

Flow Cytometry

This test includes review of pathologic findings with correlation of the flow cytometric analysis.
Pathology consultation (CPT Code 88325)

Specimen requirements:

Biopsy Tissue:

1 cm³ of tissue in a screw-capped sterile container, with 15 ml of transport media (media supplied by Special Diagnostic Immunology Laboratory).

Fluids from Serous Effusions:

The volume of fluid necessary to phenotype the lymphocytes or blasts in serous effusions depends on the specimen cell count. Usually, 20 ml of pleural or peritoneal fluid is sufficient. Smaller volumes may be used if there is a high cell count. If possible, fluids other than spinal fluid should be anticoagulated with heparin.

CSF (Cerebrospinal Fluid):

CSF samples should contain 10 ml.

Fine Needle Aspirations:

FNAs obtained in syringe with RPMI transport media
Aspirate should be transferred from syringe into sterile plastic collection tubes.

Bone Marrow:

A minimum of 1 – 2 ml collected aseptically in syringe containing heparin.
Bone marrow may also be collected in sodium heparin vacutainer tube.

Peripheral Blood:

A minimum of 4 ml peripheral blood collected in sodium heparin tube.
*EDTA tube (5 ml) may suffice if specimen is less than 30 hours old.

Collection Notes:

Specimens requiring surgical pathology diagnosis and flow cytometric analysis should be sent fresh, directly to Surgical Pathology on saline-soaked gauze placed in a sterile container. The pathologist will separate an adequate sample for flow cytometric analysis.

Specimens requiring only flow cytometry should be sent as per surgeon orders for biopsy procedures. Sterile specimen tube containing RPMI 1640 media with 25 mM Hepes buffer with L-glutamine should be readily available.

Contact the Special Diagnostic Immunology Laboratory at **551-996-4965** with any questions.

All biopsy tissue specimens must be completely immersed in 10% FCS in 1640 RPMI transport media. The biopsy specimen must be delivered immediately to the Special Diagnostic Immunology Laboratory.

Do not refrigerate or freeze. Promptly forward at ambient temperature

Indicate name and telephone number of the ordering physician and brief patient history (new diagnosis, relapse, previously treated lymphoma etc).

Specimens must be labeled with specimen source, patient’s name, medical record number or accession number, date of birth, and date and time of procurement in the presence of the patient (“bedside”).

Specimens must be received within 12 hours of procurement.

Note*: Specimens immersed in formalin (even if briefly) will not be processed.

Turnaround Time:

1 – 2 days

Set-up schedule:

Monday – Friday, 8:30 AM – 5:30 PM
Please call 551-996-4965 for night and weekend specimens.

Normal Range:

No detectable monoclonal population, with lymphocyte subsets in expected proportions. **No aberrant loss or aberrant expression of surface markers.**

Lymphoma Monoclonal Antibody List:

T Cells:

CD1a
CD2
CD3
CD4
CD5
CD7
CD8
T-cell receptor (alpha / beta)
T-cell receptor (gamma / delta)

B Cells:

CD5 (B cell subset)
CD19
CD20
CD22
CD23
FMC7
Kappa light chains
Lambda light chains
IgA, IgD, IgG, IgM, Heavy chains

NK Cells

CD56

Leukocytes

CD45

Plasma Cells

CD38

CD138 plasma cells

CD28

CD27

Miscellaneous:

CD10 CALLA

CD11c Protein 150, 95 (HCL)

CD25 Interleukin 2 receptor (HCL)

CD30 Ki-1 Antigen

CD33 Myeloid marker

CD52

CD34 Precursor cells

CD71 Transferrin receptor

CD103 Mucosal lymphocyte antigen (HCL)

BCL-2

HLA-DR

CD79

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Specimen Requirements

MYELOPEROXIDASE STAINING

CPT Code: 88184, or 88185 (reflex)

Components: **Method:**

Intracellular myeloperoxidase staining
by monoclonal antibody **Flow Cytometry**

Specimen requirements:

Bone Marrow:

A **minimum of 1-2 ml bone marrow** collected in aseptic syringe containing heparin. Bone marrow may also be collected in sodium heparin vacutainer tube.

Peripheral Blood:

A minimum of 4 ml of peripheral blood collected in EDTA or sodium heparin tube.

A bone marrow and/or blood smear prepared on a glass slide should accompany bone marrow specimen.

Collection Notes:

All specimens **must be transported at room temperature** and arrive immediately after procurement.

Specimens must not be subject to temperature extremes, clotted, hemolyzed or agglutinated.

Specimens must be labeled with specimen source, patient's name, medical record number and/or accession number, date of birth and date and time of procurement.

Turnaround Time: 1-2 days

Set-up Schedule: Monday – Friday, 8:30 AM – 5:30 PM

Normal Values: **Positive in granulocytes, monocytes (dim) and myeloblasts.**

Note: This test is also reflexed from leukemia immunophenotyping profile (CPT Code 88184, 88185), or from a defective granulocyte respiratory burst test.

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Specimen Requirements

PNH (PAROXYSMAL NOCTURNAL HEMOGLOBINURIA)

CPT Code: 88184, 88185 (x3)

Components: **Method:**

PNH Flow cytometry

Specimen requirements: *Peripheral Blood:*
A **minimum of 4 ml.** of peripheral blood in sodium heparin tube.

Collection Notes: All specimens must be transported at room temperature and arrive within one hour of procurement.

Specimens must not be subject to temperature extremes, clotted, hemolyzed or agglutinated.

Specimens must be labeled with specimen source, patient's name, medical record number or accession number, date of birth, and date and time of procurement.

Turnaround Time: 1 – 2 days

Set-up Schedule: Monday – Friday, 8:30 AM – 5:30 PM
Please call **551-996-4965** for night and weekend STAT specimens.

Normal Value: **Expression of CD55 and CD59 on all granulocytes and all red blood cells.**

PNH Antibody List:

CD55 Granulocytes / RBCs

CD59 Granulocytes / RBCs

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Specimen Requirements

SEZARY PANEL

CPT Code:

88184, 88185 (x5)

Components:

%CD3 (Mature T cells)
%CD3+4+ (Helper/Inducer)
%CD3+8+ (Cytotoxic/Suppressor)
%CD4+7- (Sezary cell subset)
%CD7+ (Pan T cells)
CD4/CD8 ratio

Method:

Flow cytometry
Flow cytometry
Flow cytometry
Flow cytometry
Flow cytometry
Calculation

Patient preparation:

None

Specimen requirements – *Adult*:

5.0 ml (**minimum 2.0 ml**) whole blood (**EDTA**)

10.0 ml (**minimum 5.0 ml**) whole blood (**Sodium heparin**), if specimen greater than 30 hours old.

Ambient (room) temperature.

Specimen requirements – *Child*:

1-3 ml whole blood (EDTA)

Collection Notes:

Do not refrigerate or freeze. Transport at room temperature.

Specimens must not be subject to temperature extremes, clotted, hemolyzed or agglutinated.

Specimens should be received in the lab within 30 hours of collection.

Specimens must be labeled with patient's name, medical record number and/or accession number, date of birth, and date and time of procurement.

Set-up Schedule:

Monday – Friday, 8:30 AM- 5:30 PM
Not available on weekends

Turnaround Time:

1 – 2 days

Reference Range:

A CD4+CD7- lymphocyte subset in normal individuals comprises less than 10.8% of the total lymphocytes.

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Specimen Requirements

STEM CELL ENUMERATION ASSAY

CPT Code: 86587

Components:

Absolute CD34
% CD34
% Viability

Methods:

Flow cytometry
Flow cytometry
Flow cytometry

CBC with differential

See Hematology

Specimen Requirements:

Depending on the patient's protocol, any of the following specimen types are acceptable.

Peripheral Blood: one 10 ml EDTA tube

Pheresis product: one EDTA tube (minimum 2 ml)

Cord Blood: one EDTA tube (minimum 2 ml)

Bone Marrow: A **minimum of 1 – 2 ml** collected aseptically in syringe containing heparin.

Bone marrow may also be collected in sodium heparin vacutainer tube.

One EDTA tube (3 ml) for the WBC and differential.

Collection Notes:

All blood samples **must be transported at room temperature.**

All specimens must not be subject to temperature extremes, clotted, hemolyzed or agglutinated.

Specimens must be received within 16 hours of procurement.

Specimens must be labeled with specimen source, patient's name, medical record number and/or accession number, date of birth, and date and time of procurement.

Turnaround Time:

1 day

Set-up Schedule:

Monday – Friday, 8:30 AM – 5:30 PM

Please call **551-996-4965** for night and weekend STAT specimens.

Reference Range:

Not applicable

