

## SUGGESTED BIOPSY SITES FOR DIRECT IMMUNOFLUORESCENCE AND SERUM STUDIES

### BULLOUS DISEASES: INDICATED DIRECT IMMUNOFLUORESCENT (DIF) AND SERUM STUDIES\*

#### SKIN LESIONS

**If pemphigoid or epidermolysis bullosa acquisita is suspected,** take skin biopsy with ~2/3 normal skin and ~1/3 edge of lesion. For best DIF results, take second biopsy ~3mm from lesion.

**If pemphigus is suspected,** take skin biopsy with ~2/3 normal skin and ~1/3 lesion edge plus serum for best diagnostic results. Also do IgG4 DIF. For best results take 2nd biopsy as for pemphigoid.

**If dermatitis herpetiformis is suspected,** take normal skin ~3 mm from lesion for best results. Serum tests by IIF-IgA EmA and tTG ELISA increase sensitivity.

**If porphyria or pseudoporphyria is suspected,** take skin biopsy with ~2/3 normal skin and ~1/3 lesion edge for best DIF results.

**If in doubt, take two biopsies** – one perilesional, as for pemphigoid, and one normal, as for DH, for best results.

**If eruptions with other non-disease specific immune deposits are suspected,** including lichenoid, psoriasiform or factitious lesions, or related disorders, take biopsy as for porphyria for DIF and lesional biopsy for light microscopy.\*

#### MUCOSAL LESIONS

**If pemphigoid is suspected,** take normal mucosa ~3 mm from lesion or Nikolsky sign. For best DIF results, take second biopsy 3-10mm from lesion.

**If pemphigus or paraneoplastic pemphigus is suspected,** take normal mucosa ~3 mm from lesion or Nikolsky sign **plus serum.** For best diagnostic results, take two biopsies as for pemphigoid.

**If erosive lichen planus (LP) is suspected,** take mucosal biopsy with ~2/3 normal mucosa and ~1/3 edge of lesion or of Nikolsky sign for best DIF results.

#### HEREDITARY EPIDERMOLYSIS BULLOSA (EB)

If hereditary EB needs to be classified or confirmed, take biopsy of **induced** lesion in normal skin.

### CONNECTIVE TISSUE DISEASES: INDICATED DIRECT IMMUNOFLUORESCENT (DIF) AND SERUM STUDIES

**If SLE is suspected,** take biopsy of sun-exposed normal skin of forearm for DIF for LE band test and blood in red top tube for serum studies for ANA and tests for ARA criteria.

**If DLE is suspected,** take biopsy of lesion in sun-exposed area of 3 or more months duration for DIF and for light microscopy.\* Non-sun-exposed areas are of little value.

**If SCLE or Sjogren's syndrome is suspected,** take sun-exposed skin lesion biopsy for DIF for in vivo ANA and blood in red top tube for serum tests for ANA, Ro (SS-A) and La (SS-B).

**If scleroderma is suspected,** take biopsy of sun-exposed skin for DIF and C+DIF studies and blood for serum studies (Profile E).

### IMMUNE COMPLEX MEDIATED VASCULITIS: INDICATED DIRECT IMMUNOFLUORESCENT STUDIES\*

**If leukocytoclastic vasculitis is suspected,** (or most other immune complex vasculitides), take biopsy for DIF either of a fresh lesion, less than 48 hours old, or of the edge of a lesion plus adjacent normal skin.

**If Henoch Schoenlein purpura is suspected,** take biopsy of a fresh lesion (less than 48 hours old).

**If stasis dermatitis is suspected,** take biopsy for DIF of edge of skin lesion plus adjacent normal skin.

### MOLECULAR TESTING FOR T CELL NEOPLASMS

If T cell neoplasm is suspected, send (a) 3-5ml whole blood in EDTA, ACD or heparin tube, or (b) skin biopsy in RPMI media, or (c) 5 unstained skin section slides.

\* Additional/separate biopsy should be sent in formalin.

Light microscopic studies of lesional biopsy sites are indicated, in most cases of vesiculobullous, connective tissue disease, vascular disorders and T cell disorders.

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## DATA ON SKIN AND MUCOSAL BIOPSIES

Interpretation of direct immunofluorescence (IF) of tissue specimens requires knowledge of the location of the biopsy relative to the clinical lesion. **FOR ALL DIRECT IF SPECIMENS, PLEASE FILL OUT THIS PANEL.**

Biopsy of:  skin  oral mucosa  conjunctiva  other

Specific location:

Lesional site: \_\_\_\_\_

Normal site: \_\_\_\_\_

Perilesional site: \_\_\_\_\_

For Lupus:  sun exposed  sun protected

If applicable please draw the biopsy site as it relates to the lesion.



See "Suggested biopsy sites" for major bullous and collagen-vascular diseases on panels to the left.

Fixative used:  Beutner Labs  Other: \_\_\_\_\_  
(Biopsies in formalin can NOT be used for DIF.)

Clinical diagnoses: \_\_\_\_\_

ICD-10 Code (Required): \_\_\_\_\_

Clinical findings: \_\_\_\_\_

Therapy: \_\_\_\_\_

ANA titer \_\_\_\_\_

Anti Ro(SS-A)/La(SS-B): \_\_\_\_\_ ANA pattern \_\_\_\_\_

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1-800-288-0549 OR INDICATE BELOW OR  
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**BIOPSY KITS**  
(4 KITS/BOX) # \_\_\_\_\_

**SERUM KITS**  
(4 KITS/BOX) # \_\_\_\_\_

**4-TUBE KITS**  
(BX, SR, H&E) # \_\_\_\_\_

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Buffalo, NY 14215  
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(716) 838-0798 Fax  
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### TEST REQUEST FORM

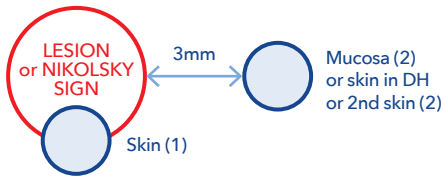
PLEASE COMPLETE ALL ITEMS TYPE OR PRINT PER HIPAA REGULATIONS		
Patient Last Name		
First Name	MI	
Parent Name (if patient is a minor)		
Address		
City	State	Zip
DOB (M/D/Y)	Age:	Sex: <input type="checkbox"/> M <input type="checkbox"/> F
<b>DATE OF SPECIMEN</b> (Required by State and Federal Law)		
Please Bill: <input type="checkbox"/> Insurance <input type="checkbox"/> Patient <input type="checkbox"/> Lab <input type="checkbox"/> Doctor		
I accept responsibility for bills related to the testing of my specimen: <b>PATIENT SIGNATURE</b>		
HEALTH INSURANCE INFORMATION REQUIRED COPIES OF INSURANCE CARDS, FRONT AND BACK		
<input type="checkbox"/> Inpatient <input type="checkbox"/> Outpatient <b>If Inpatient, please complete:</b>		
Facility		
Address		
City	State	Zip
Admin Date	MR/Lab #	
Insurance Company		
Policy #	Group #	
Authorization # (if insurance requires)		
<b>Requesting Doctor</b>		
Specialty	<b>NPI #</b>	
Group Name		
Address		
City	State	Zip
Doctor's Email		
Doctor's Phone	( )	
HIPAA Fax	( )	
<b>PHYSICIAN SIGNATURE</b>		
<b>*Required by CMS</b>		

## BULLOUS DISEASES

### SKIN AND MUCOSAL BIOPSY STUDIES

- 001  Direct immunofluorescence (DIF) for IgG, IgA, IgM, fibrin and C3. If needed, IgG4 and/or IgG1 are also added for greater sensitivity.
- 002  Differentiation of bullous pemphigoid from epidermolysis bullosa acquisita by DIF of 1 M NaCl split biopsy (with no vesicles)
- 003  Light microscopy (H&E)
- 004  Light microscopy (H&E) - consult only

#### BLISTERING AND OTHER ERUPTIONS



Please fill in data on back of form. See back of form for abbreviations.

- (1) Skin biopsy in most pemphigus/pemphigoid cases.
- (2) Mucosal biopsy or skin biopsy for DH or 2nd skin biopsy for pemphigus or pemphigoid cases.

### SERUM STUDIES

- 013  Pemphigus/pemphigoid antibody titer on monkey esophagus by IgG & IgG4 indirect IF (Mk. esoph-IIF)
- 014  Split skin, pemphigoid/epidermolysis bullosa acquisita (EBA) differentiation by IgG & IgG4 indirect IF (Split-IIF)
- 015  Desmoglein (Dsg3 and Dsg1) ELISA for pemphigus antibodies
- 016  BP230 (BPAG1) and BP180 (BPAG2) ELISA for pemphigoid antibodies
- 017  Paraneoplastic pemphigus antibody titer (on rat bladder) (PPA-IIF)
- 009  Envoplakin antibodies (ELISA)
- 018  Pemphigus antibody titer prognostic test comparing old and new sera for IgG and IgG4 (Mk. esoph-IIF)
- 019  Pemphigoid gestationis (HG) factor (HG-IIF)
- 020  IgA anti endomysial antibodies (AEmA-IIF)
- 021  IgA tissue transglutaminase antibodies (tTG-ELISA)
- 022  IgA epidermal transglutaminase antibodies (eTG-ELISA)
- 023  Antibodies to collagen VII (ELISA) to rule out EBA
- 024  IgA split skin - IIF, linear IgA bullous dermatosis (LABD)

### SERUM PROFILES

#### BASIC PEMPHIGUS - PEMPHIGOID SCREEN

- 013  **Basic P-P Screen**  
Mk. esoph. for IgG and IgG4 antibodies by indirect immunofluorescence (IIF).  
Do other profiles if positive  Yes  No

#### PEMPHIGUS PROFILE

- 025  **Profile #1**  
Mk. esoph. for IgG and IgG4 antibodies by IIF and Dsg 3/1 ELISA.

#### PARANEOPLASTIC PEMPHIGUS

- 026  **Profile #2**  
Mk. esoph. for IgG, IgG1 & IgG4 antibodies by IIF plus IIF on rat bladder and Dsg3/1 ELISA and envoplakin ELISA.

#### PEMPHIGOID/EBA PROFILE

- 027  **Profile #3**  
Mk. esoph. and split skin for IgG & IgG4 antibodies by IIF and BP180 plus BP230 ELISA, or Collagen VII antibodies by ELISA.

#### DERMATITIS HERPETIFORMIS AND CELIAC DISEASE

- 020  IgA anti endomysial antibodies (AEmA-IIF)
- 021  IgA tissue transglutaminase antibodies (tTG-ELISA)
- 022  IgA epidermal transglutaminase antibodies (eTG-ELISA)
- 028  AEmA, tTG-ELISA and eTG-ELISA

### HEREDITARY EPIDERMOLYSIS BULLOSA

- 011  IF mapping of pencil eraser induced clefts in normal skin away from lesions for hereditary epidermolysis bullosa (EB):
- Primary screen for collagen type VII, collagen type IV, & keratin 14 to check for suitable biopsy
  - For suitable biopsies, test for collagen XVII, alpha6 integrin, beta4 integrin, laminin 332 and plectin to differentiate dystrophic EB and junctional EB from EB simplex
- 003  Light microscopy for hereditary EB of an intact, spontaneous vesicle or a freshly induced perilesional cleft for diagnosis of HEREDITARY EB.

### MOLECULAR STUDIES (SERUM/BIOPSY)

#### T CELL NEOPLASMS

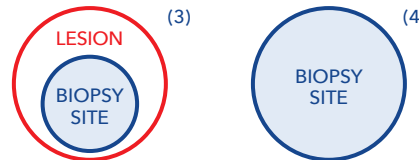
- 048  Gamma receptor rearrangement
- 049  **Profile** (gamma and beta receptor rearrangement)

## LUPUS ERYTHEMATOSUS, CONNECTIVE TISSUE & VASCULAR DISEASE

### SKIN AND MUCOSAL BIOPSIES

- 005  Direct immunofluorescence for SLE, DLE & SCLE with tests for IgG, IgA, IgM, fibrin and C3
- 007  Direct immunofluorescence for dermatomyositis with tests for IgG, IgA, IgM, fibrin, C3 and C5b-9
- 006  Direct immunofluorescence for vasculitis with tests for IgG, IgA, IgM, fibrin and C3
- 008  Complement plus Direct IF (C+DIF) for scleroderma & others with human complement + anti-C3
- 003  Light microscopy (H&E) to rule out LE\*
- 004  Light microscopy (H&E) - consult only

#### COLLAGEN VASCULAR DISEASES



Please fill in data on back of form. See back of form for abbreviations.

- (3) Sun exposed skin biopsy in most LE cases.  
Skin biopsy to rule out Henoch Schoenlein purpura and vasculitis (lesion less than 48 hours old)
- (4) Skin biopsy to rule out SLE

### SERUM STUDIES\*

- 029  Antinuclear antibody (ANA) titers and patterns on HEp2 cells by standard ANA
- 030  Antibodies to native (n) DNA
- 032  Anticentromere antibodies (ACA)
- 033  Stratified epithelium specific ANA (SES-ANA)/titer for Chronic Ulcerative Stomatitis

\* All positives are titrated.

### ELISA STUDIES: ANTIBODIES TO EXTRACTABLE NUCLEAR ANTIGENS, ETC.

- 034  Sm, RNP, Ro(SS-A) and La(SS-B) -SLE & Others
- 035  Ro(SS-A) -SLE, SCLE, SjSy & Others
- 036  La(SS-B) -SLE, SCLE, SjSy & Others
- 037  Sm -SLE
- 038  RNP -SLE, MCTD & Others
- 039  Scl-70 -systemic sclerosis
- 040  Jo-1 -polymyositis & dermatomyositis
- 041  Antibodies to histone
- 042  Anti-beta2 glycoprotein I IgG

NOTE: SERUM STUDIES AND PROFILES REQUIRE A MINIMUM OF 2-5ml OF SERUM

## SYSTEMIC CONNECTIVE TISSUE DISEASE SERUM STUDY PROFILES

### BASIC PROFILE A

- 043  **Basic Profile A**  
ANA titers and patterns on HEp2 cells, antibodies to Ro(SS-A) and La(SS-B).

### SYSTEMIC LE SCREEN

- 044  **Profile B**  
ANA titers and patterns on HEp2 cells, antibodies to nDNA, Ro(SS-A), La(SS-B), Sm and RNP.

### SYSTEMIC CONNECTIVE TISSUE DISEASES SCREEN

- 045  **Profile C**  
ANA titers and patterns on HEp2 cells, antibodies to nDNA, Ro(SS-A), La(SS-B), Sm, RNP, Jo-1, Scl-70 and beta2 glycoprotein I IgG.

### DRUG INDUCED LE/SLE SCREEN

- 046  **Profile D**  
ANA titers and patterns on HEp2 cells, antibodies to nDNA, Ro(SS-A), La(SS-B), Sm, RNP and histone.

### SYSTEMIC SCLEROSIS SCREEN

- 047  **Profile E**  
ANA titers and patterns on HEp2 cells, Scl-70, Sm, RNP and ACA.

### DIAGNOSTIC IMMUNOLOGY

### SARS-CoV-2 (COVID-19)

- 050  **SARS-CoV-2 Antibody (spike protein)**  
For assessment of antibodies induced by natural infection or vaccination
- 051  **SARS-CoV-2 Total Nucleocapsid Antibody (IgG, IgA, IgM)**  
For assessment of antibodies induced by natural infection
- 052  **SARS-CoV-2 Comprehensive Antibody Profile**  
Includes 050 and 051

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