The Immunodermatology TESTING REPORT from the University of Utah follows “See Note” and is arranged as outlined below on the following pages:

CLINICAL INFORMATION
This content is provided by the ordering clinician and includes the reason for testing.

Specimen Details
This includes specimen identification with collected and received dates.

DIAGNOSTIC INTERPRETATION
This is a synopsis of key findings from the testing and their diagnostic relevance.

RESULTS
This section reports the discrete finding and value of each test component, along with the reference range.

COMMENTS
Specific
These comments provide an explanation of the test results as they relate to clinical considerations, and include reference to any concurrent and/or previous testing.

General
These comments summarize fundamental information about the test(s) and the component(s) assessed to aid in interpretation of their clinical applicability.

TESTING METHODS
The section lists the procedures performed, the test source(s), and the applicable laboratory developed test disclaimer(s).

TEST RESULTS SUMMARY CHART
A chart tabulating results of tests ordered for the patient by the same client is included if previous and/or concurrent testing has been performed.

ELISA RESULTS GRAPH
A graph of ELISA results also is included if previous and/or concurrent testing has been performed; the graph may be found on a subsequent page.

For testing algorithm and additional information, refer to:
arupconsult.com/content/immunobullous-skin-diseases-screening
## IMMUNODERMATOLOGY LABORATORY REPORT

**Patient:**
F, 72 yrs, [redacted]

**Submitter:**

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**ARUP Sendouts**

**Bullous Pemphigoid (BP180 and BP230) Antibodies, IgG by ELISA** (Final result)

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**TESTING REPORT follows "See Note"**

**See Note**

**CLINICAL INFORMATION**
Urticarial plaques, blisters, and pruritus. Presumptive diagnosis is persisting bullous pemphigoid versus urticarial vasculitis versus contact dermatitis.

**Specimen Details**
S22-IP0000926 - Serum; Collected: 7/8/2022; Received: 7/11/2022

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**DIAGNOSTIC INTERPRETATION**

**Bullous Pemphigoid (BP180 and BP230) IgG Antibodies monitoring,** consistent with pemphigoid

(See Results, Comments, Test Results Summary Chart with previous and current findings, and Graph of ELISA results in the Enhanced Electronic Report/EELR and/or available upon request)

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**RESULTS**

Enzyme-linked Immunosorbent Assay (ELISA)

Bullous Pemphigoid (BP)180 and BP230 IgG Antibodies

IgG BP180 antibody level: 64 U/mL (H)
Patient: ARUP Accession: 22-189-103656

F, 72 yrs. | POP: Unspecified

Reference Range:
Normal (negative) = Less than 9 U/mL
Increased (H) (positive) = 9 U/mL and greater

IgG BP230 antibody level: 3 U/mL

Reference Range:
Normal (negative) = Less than 9 U/mL
Increased (H) (positive) = 9 U/mL and greater

(H) = high/positive
U = antibody level in ELISA units

COMMENTS

Specific

The increased IgG BP180 antibody level in this ELISA testing provides support for the diagnosis of pemphigoid. Of note, up to 7 percent of individuals unaffected by pemphigoid, including some with other immunobullous diseases, have increased IgG BP180 and/or IgG BP230 antibody levels, although, generally, those patients who have a relatively high level of IgG BP180 antibodies, as observed in this specimen, are affected with pemphigoid. Previous ELISA testing demonstrated increased IgG BP180 antibody levels. See chart (below) for summary of previous and current test results; a graph of the ELISA results is available in the Enhanced Electronic Report/EELR and/or available upon request by contacting ARUP Client Services at 1-800-242-2787, option 2, and ask to speak with the Immunodermatology Laboratory at the University of Utah regarding patient results.

Additional considerations are that co-expression of IgG and IgA basement membrane zone antibodies may develop in patients with pemphigoid, which may have implications for disease severity and treatment approach, or that overlapping antibody expression develops to other basement membrane zone antigens that can be detected by ELISA for IgG type VII collagen antibodies. If indicated to further evaluate the immunopathological profile with respect to basement membrane zone antibodies currently, additional indirect immunofluorescence testing may be performed on this specimen by contacting ARUP Client Services, 1-800-242-2787, option 2, with add-on test request(s) for:
- Basement Membrane Zone (Epithelial) Antibodies, IgG by IIF (ARUP test number 0092096) and
- Basement Membrane Zone (Epithelial) Antibodies, IgA by IIF (ARUP test number 0092097) with or without
- Collagen Type VII Antibody, IgG by ELISA (ARUP test number 2010905).

Detection, levels, and patterns of diagnostic antibodies may fluctuate with disease manifestations, and IgG BP180 antibody levels may correlate with disease activity in some patients with pemphigoid. Clinical correlation is needed, including with treatment status. Monitoring
antibody profiles by indirect immunofluorescence as well as continued monitoring of antibody levels by ELISAs may aid in assessing disease expression and activity, including response to therapy.

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General

Major molecular structures in the basement membrane zone to which IgG pemphigoid antibodies bind have been identified and termed "BP180" for a 180 kDa bullous pemphigoid antigen (also known as bullous pemphigoid antigen 2, BPAG2, or type XVII collagen, COL7) and "BP230" for a 230 kDa bullous pemphigoid antigen (also known as bullous pemphigoid antigen 1, BPAG1). BP180 is a transmembrane component of the basement membrane zone with collagen-like domains; the non-collagenous 16A (NC16A) antigenic domain of BP180 has been identified as a main antigenic target. BP230 is located in the hemidesmosomal plaque of basal cells in the epidermis. Serum levels of IgG BP180 and IgG BP230 antibodies are determined by enzyme-linked immunosorbent assays (ELISA), and serum levels of IgG BP180 antibodies may correlate with disease activity in pemphigoid, diminishing with treatment response. Up to 7 percent of individuals who do not have pemphigoid, including patients with other immunobullous diseases, have increased levels of IgG BP180 and/or BP230 antibodies by ELISAs. In patients with pemphigoid, IgG BP180 and/or IgG BP230 antibody levels, determined by ELISAs, may be more sensitive diagnostic markers than indirect immunofluorescence, and, in patients with epidermolysis bullosa acquisita, the IgG type VII collagen antibody level, determined by ELISA, may be a more sensitive diagnostic marker than indirect immunofluorescence. Patients with pemphigoid or epidermolysis bullosa acquisita may show reactivity to multiple basement membrane zone components in addition to or other than the BP180 and BP230 epitopes and type VII collagen epitopes displayed in the respective ELISAs.

TESTING METHODS

Enzyme-Linked Immunosorbent Assay (ELISA)

IgG BP180 and IgG BP230 serum antibody levels determined by U.S. Food and Drug Administration (FDA)-approved ELISAs (Mesacup, MBL BION). [Two ELISAs]

TEST RESULTS SUMMARY CHART

Basement Membrane Zone Antibodies

<table>
<thead>
<tr>
<th>Serum Number</th>
<th>Date of Specimen</th>
<th>IgG BMZ Titer</th>
<th>IgA BMZ Titer</th>
<th>IgG BP180</th>
<th>IgG BP230</th>
<th>IgG Type VII</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-3011</td>
<td>09/01/21</td>
<td>96</td>
<td>ME: NA</td>
<td>ME: NA</td>
<td>SS: NA</td>
<td>SS: NA</td>
</tr>
<tr>
<td>21-4882</td>
<td>11/30/21</td>
<td>70</td>
<td>ME: NA</td>
<td>ME: NA</td>
<td>SS: NA</td>
<td>SS: NA</td>
</tr>
</tbody>
</table>
**Patient, Test**

**F, 72 yrs, [redacted]**

**POC: Unspecified**

<table>
<thead>
<tr>
<th>Date</th>
<th>Age</th>
<th>ME:</th>
<th>SS:</th>
<th>ME:</th>
<th>SS:</th>
<th>BP180</th>
<th>BP230</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-5578</td>
<td>12/15/21</td>
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<td>79</td>
<td>4</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>22-0496</td>
<td>06/21/22</td>
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<td>NA</td>
<td>64</td>
<td>3</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**ELISA Reference Ranges:**
- IgG BP180 and IgG BP230 Antibody Levels
  - Normal (negative) = Less than 9 U/mL
  - Increased (H) (positive) = 9 U/mL and greater
- IgG Type VII Collagen Antibody Level
  - Normal (negative) = Less than 7 U/mL
  - Slightly increased (H) (positive) = 7-8 U/mL
  - Increased (H) (positive) = 9 U/mL and greater

**Chart Key:**
- IgG BMZ = IgG basement membrane zone (BMZ) antibodies by indirect immunofluorescence
- IgA BMZ = IgA basement membrane zone (BMZ) antibodies by indirect immunofluorescence
- ME = Antibody absence (negative) or antibody presence (positive endpoint titer) on monkey esophagus (ME) substrate
- SS = Antibody absence (negative) or antibody presence (positive pattern and endpoint titer) on split skin (SS) substrate
- Epi = epidermal localization (roof) on split skin substrate (IgG - pemphigoid including bullous pemphigoid, some mucous membrane pemphigoid, and other pemphigoid variants; IgA - linear IgA disease including linear IgA bullous dermatosis and chronic bullous disease of childhood)
- Derm = dermal localization (floor) on split skin substrate (IgG - epidermolysis bullosa acquisita, bullous lupus erythematosus, anti-laminin-332 pemphigoid, anti-p200 (laminin gamma-1) pemphigoid, other rare pemphigoid subtypes; IgA - linear IgA disease including linear IgA epidermolysis bullosa acquisita)
- Comb = combined epidermal-dermal localization (roof and floor) on split skin substrate (IgG - pemphigoid and pemphigoid variants; IgA - linear IgA disease)

**BP180** = IgG BP180 antibody level (U/mL) by ELISA

**BP230** = IgG BP230 antibody level (U/mL) by ELISA

**Col VII** = IgG type VII collagen antibody level (U/mL)
Patient, Test
F, 72 yrs,  
POP: Unspecified

by ELISA

NA = Not Assayed

Electronically signed by

PM.

ELISA RESULTS GRAPH (may be found on next page)

Resulting Laboratory
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