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Direct Immunofluorescence Staining Patterns in Blistering Disorders

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Disease	Level of Split	DIF Staining Pattern	Antigen	Notes
BP	Subepidermal	C3 > IgG in linear distribution at DEJ	NC16a subunit of BP180/type XVII collagen/BPAG2, BPAG1	Immunoreactants located on roof of salt-split skin
Bullous lupus	Subepidermal	IgM, IgG, IgA, and C3 in linear distribution at DEJ	Type VII collagen	
CP	Subepidermal	IgG and C3 in linear distribution at DEJ	BPAG1, BPAG2, laminin 5/epiligrin, laminin 6, type VII collagen, integrin β 4	Antiepiligrin CP associated with solid-organ malignancy and NHL; on salt-split skin, antibodies to epiligrin/laminin 5 and type VII collagen highlight the floor, whereas the other antibodies highlight the roof
Dermatitis herpetiformis	Subepidermal	IgA in granular deposition in dermal papillae	Epidermal transglutaminase 3	Associated with celiac disease
Drug-induced pemphigus	Immediately above the basal layer in epidermis	IgG > C3 in netlike distribution in lower epidermis	Dsg1, Dsg3	Penicillamine and captopril commonly implicated
Epidermolysis bullosa acquisita	Subepidermal	IgG and C3 in linear distribution at DEJ	Type VII collagen	Immunoreactants located on floor of salt-split skin
Herpes gestationis	Subepidermal	C3 > IgG in linear distribution at DEJ	NC16a subunit of BP180/type XVII collagen/BPAG2	Immunoreactants located on roof of salt-split skin
IgA pemphigus	Intraepidermal	IgA in netlike distribution in epidermis	Dsg1, Dsg3, desmocollin 1	
IgA pemphigus	Subcorneal	IgA in netlike distribution in upper epidermis	Desmocollin 1	Controversy over whether it is a subtype of Sneddon-Wilkinson disease

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Disease	Level of Split	DIF Staining Pattern	Antigen	Notes
Linear IgA bullous dermatosis	Subepidermal	IgA in linear distribution along DEJ	97 kD domain of BPAG2; 120 kD domain of BPAG2, BPAG1	Childhood variant known as chronic bullous disease of childhood; drug-induced form linked to vancomycin, captopril, and many others
Paraneoplastic pemphigus	Subepidermal	IgG +/- C3 in both netlike distribution in epidermis and linear distribution along DEJ	Dsg1, Dsg3, desmoplakin 1, desmoplakin 2, plectin, BPAG1, envoplakin, periplakin	Associated with lymphoproliferative malignancies and bronchiolitis obliterans; indirect immunofluorescence on rat bladder
PF	Subcorneal	IgG +/- C3 in netlike distribution in upper epidermis	Dsg1	Pemphigus erythematosus (Senear-Usher disease) is rare variant of PF that has overlap features with lupus erythematosus; fogo selvagem is a variant of PF, mostly observed in Brazil and thought to be precipitated by <i>Simulium</i> blackfly bite
Porphyria cutanea tarda	Subepidermal	IgM and C3 around blood vessels in papillary dermis	N/A	Porphyrin-induced damage to endothelial walls leads to immunoglobulin and complement deposition
PV	Immediately above the basal layer in epidermis	IgG +/- C3 in netlike distribution in lower epidermis	Dsg3 +/- Dsg1	Mucocutaneous variant has antibodies to Dsg3 and Dsg1; pemphigus vegetans is rare PV variant

Abbreviations: DIF, direct immunofluorescence; BP, bullous pemphigoid; DEJ, dermoepidermal junction; BPAG, bullous pemphigoid antigen; CP, cicatricial pemphigoid; NHL, non-Hodgkin lymphoma; Dsg, desmoglein; PF, pemphigus foliaceus; N/A, not applicable; PV, pemphigus vulgaris.

Practice Questions

- 1. Which autoimmune blistering disease shows deposition of immunoglobulin on the floor of salt-split skin?**
 - a. BP
 - b. dermatitis herpetiformis
 - c. epidermolysis bullosa acquisita
 - d. paraneoplastic pemphigus
 - e. PV

- 2. What medicine is commonly implicated in drug-induced pemphigus?**
 - a. acetaminophen
 - b. amoxicillin
 - c. naproxen
 - d. penicillamine
 - e. penicillin

- 3. Which autoimmune blistering disease predominantly shows deposition of IgG on DIF?**
 - a. dermatitis herpetiformis
 - b. IgA pemphigus
 - c. linear IgA bullous dermatosis
 - d. paraneoplastic pemphigus
 - e. porphyria cutanea tarda

- 4. Which of the following diseases has a negative direct immunofluorescence?**
 - a. dermatitis herpetiformis
 - b. herpes gestationis
 - c. pemphigus vulgaris
 - d. porphyria cutanea tarda
 - e. transient acantholytic dermatosis

- 5. Which of the following diseases shows a linear deposition of IgG and C3 along the dermoepidermal junction?**
 - a. CP
 - b. IgA pemphigus
 - c. PF
 - d. porphyria cutanea tarda
 - e. PV

Fact sheets and practice questions will be posted monthly.