



**European
Dermatology
Forum**



**Universität
Zürich**^{UZH}

Dept. of Dermatology



UNIVERSITÄTSMEDIZIN
GÖTTINGEN **UMG**
Dept. of Dermatology

21st Edition of Euroderm Excellence
Training Program

November 12-15, 2024
Budapest, Hungary



**Excellence in dermatological
diagnostics, differential
diagnostics and therapy**

Workshop 3: Dermatopathology

Prof. Dr. Christina Mitteldorf, Göttingen

Prof. Dr. Werner Kempf, Zürich

Practical approach to the
20 most common and most
important diagnoses

Interactive course with digital slides

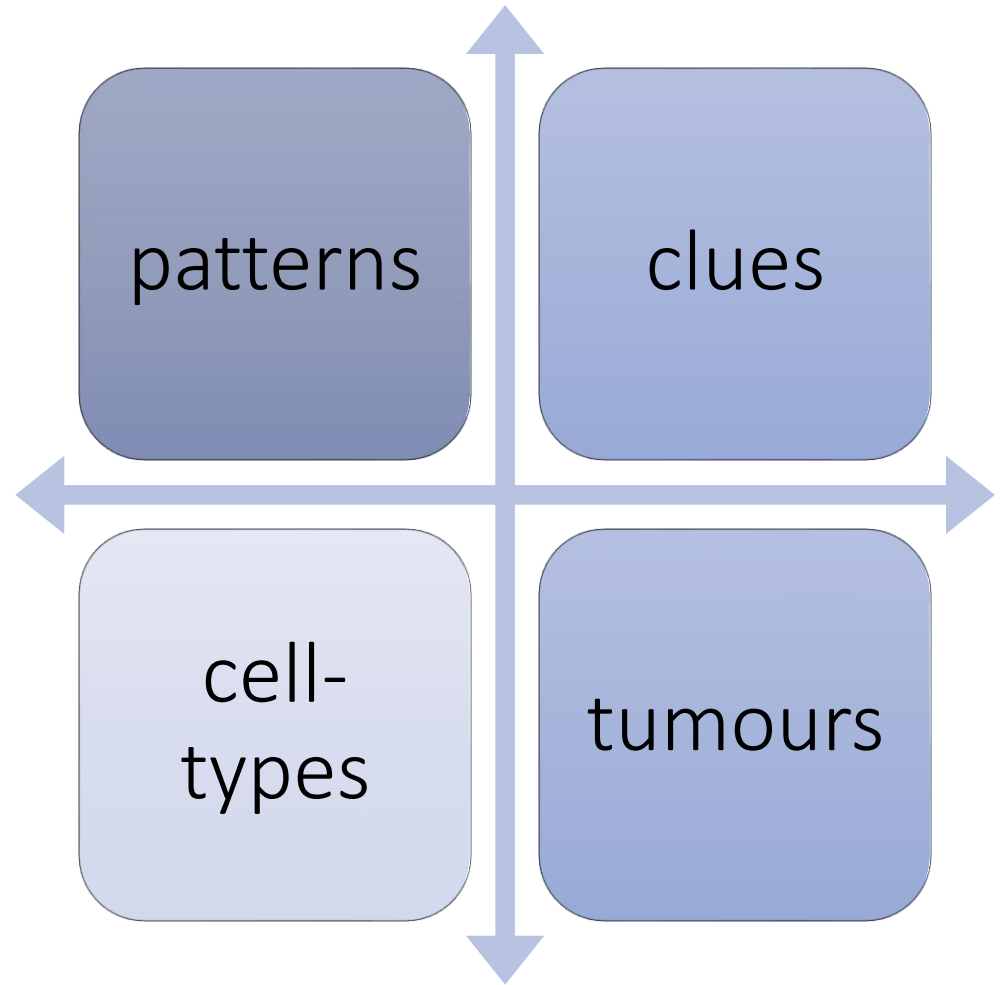
Digital slide platform of the German Society of Dermatopathology (ADH)
Christina Mitteldorf / Julia Liersch
<https://www.adh-online.de>



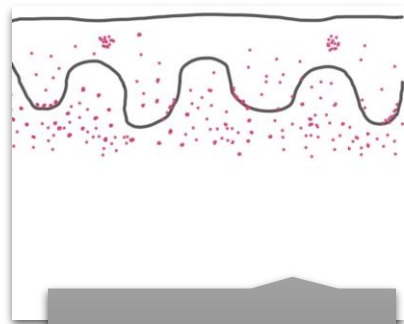
<https://adh.smartzoom.com/s8738/>

Password: budapest24

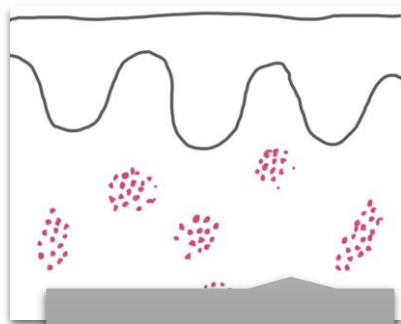
DIAGNOSTIC
BASICS
IN
DERMATO-
PATHOLOGY



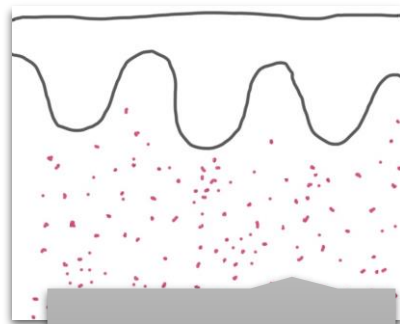
Patterns (examples)



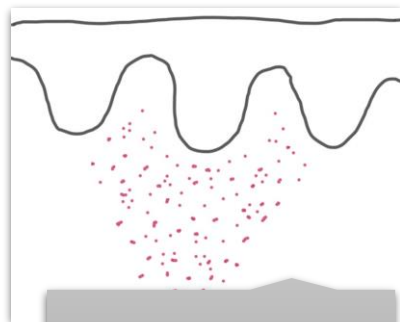
band-like, superficial



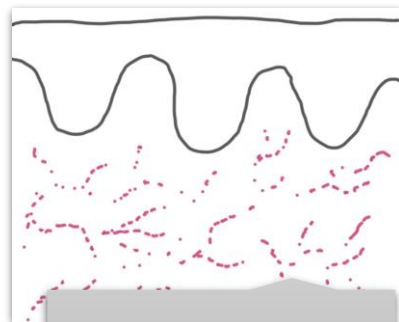
nodular



diffuse

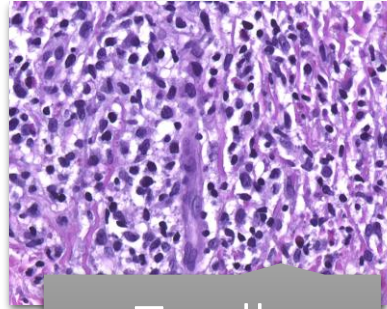


wedge-shaped

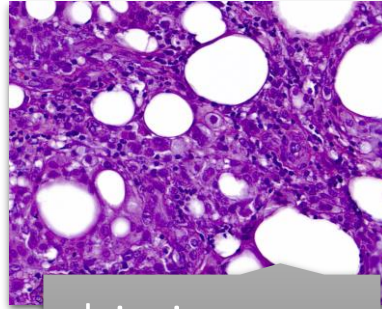


interstitial

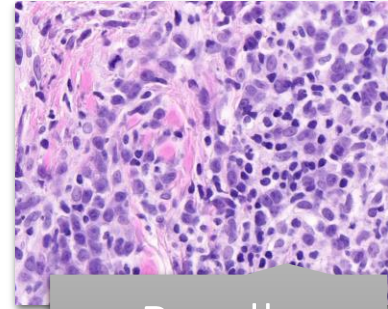
Cell types (composition of the infiltrate)



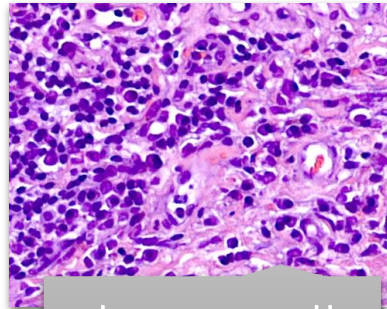
T-cells



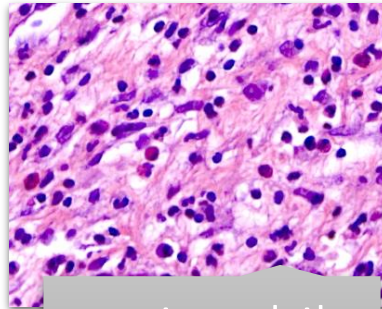
histiocytes



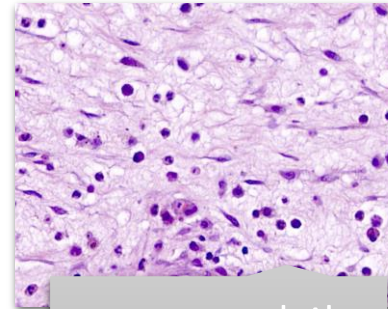
B-cells



plasma cells



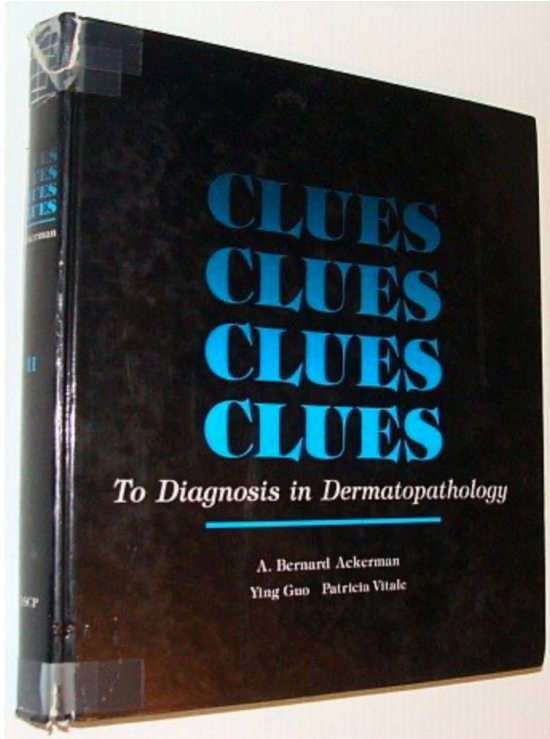
eosinophils



neutrophils

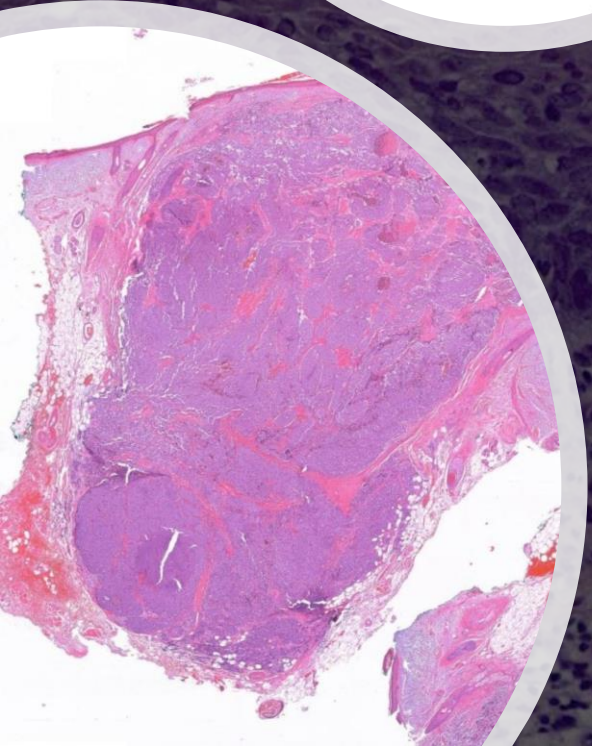
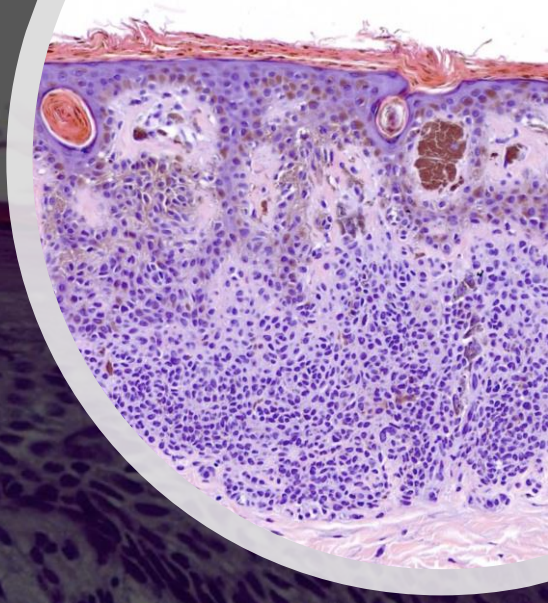
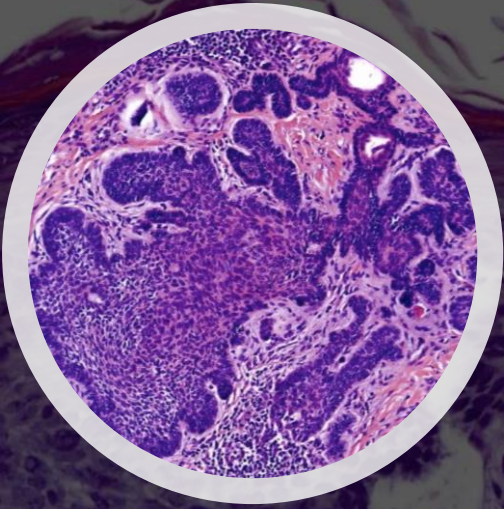
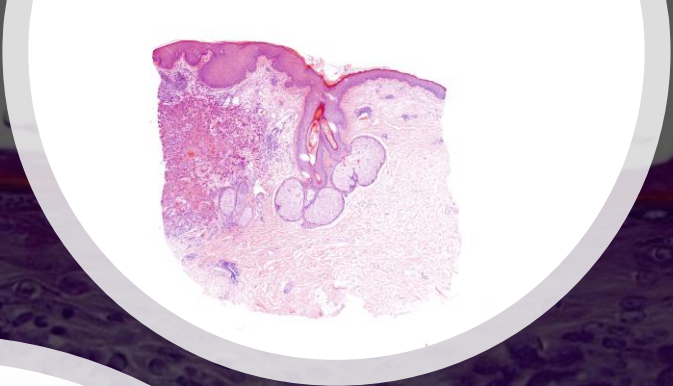
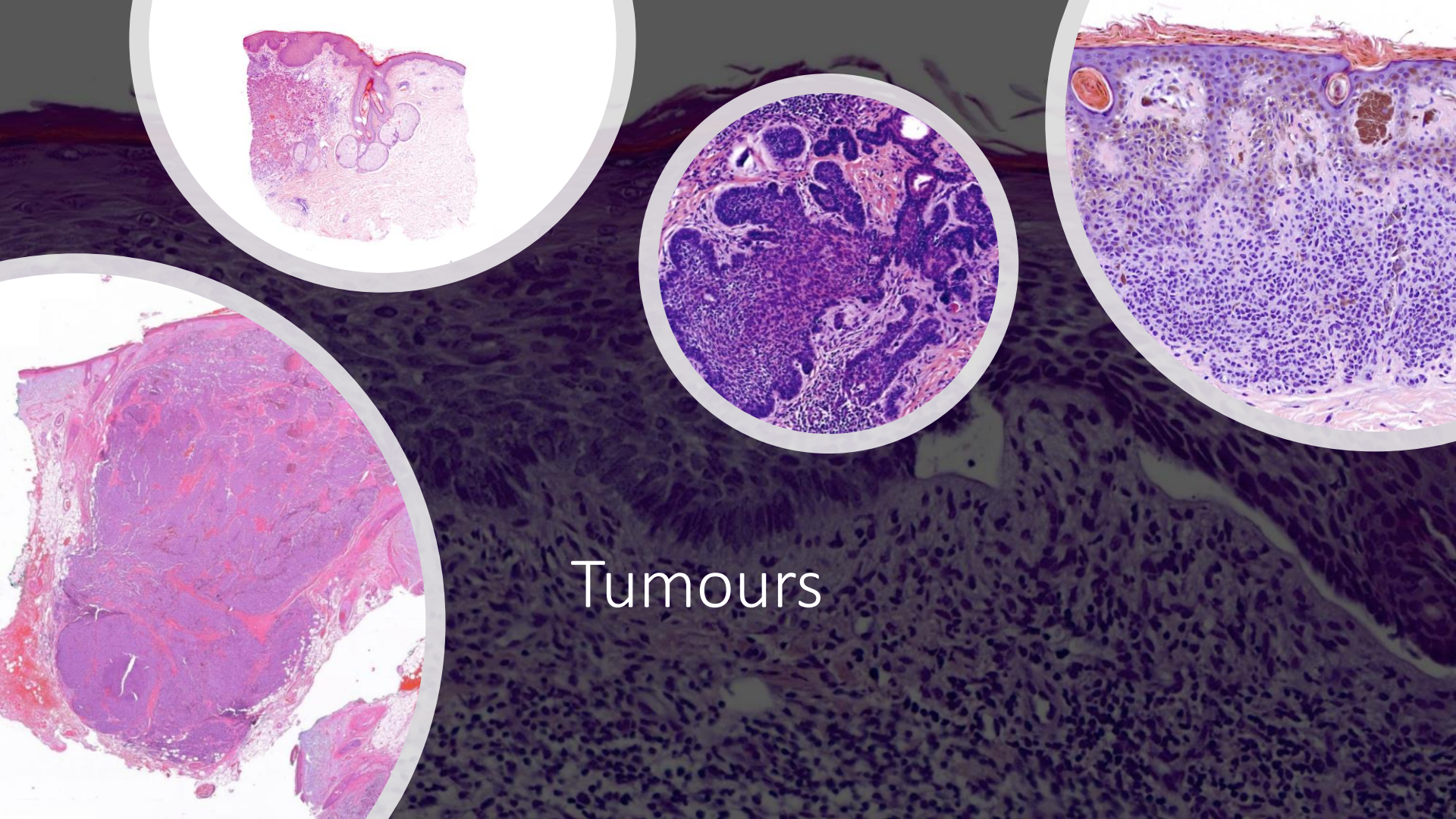
Clues

ChatGPT4.0: The word "clue" generally refers to a hint or piece of information that helps solve a problem or mystery.



300 Clues had been published:

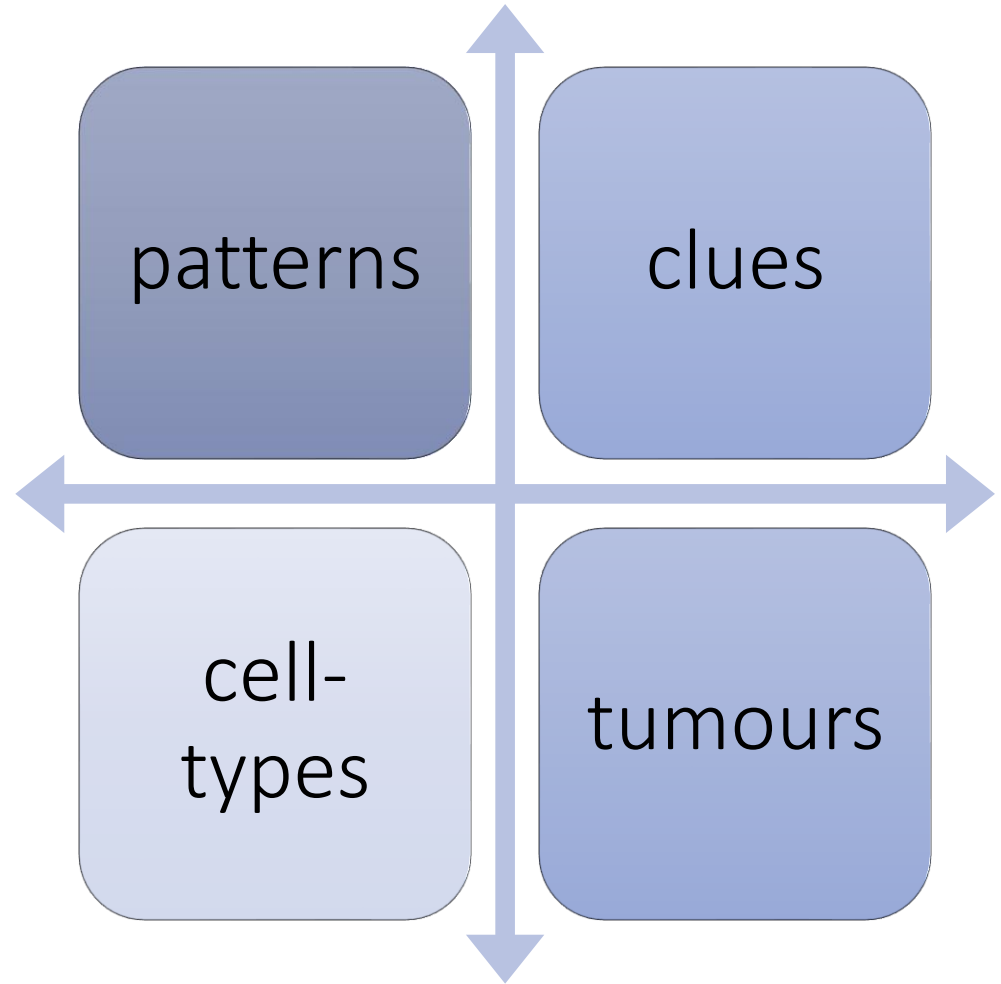
- Tumours (about 50%)
- Inflammatory diseases (about 30%)
- Cysts
- Depositions
- Artefacts
- Rarities



Tumours

DIAGNOSTIC
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PATHOLOGY

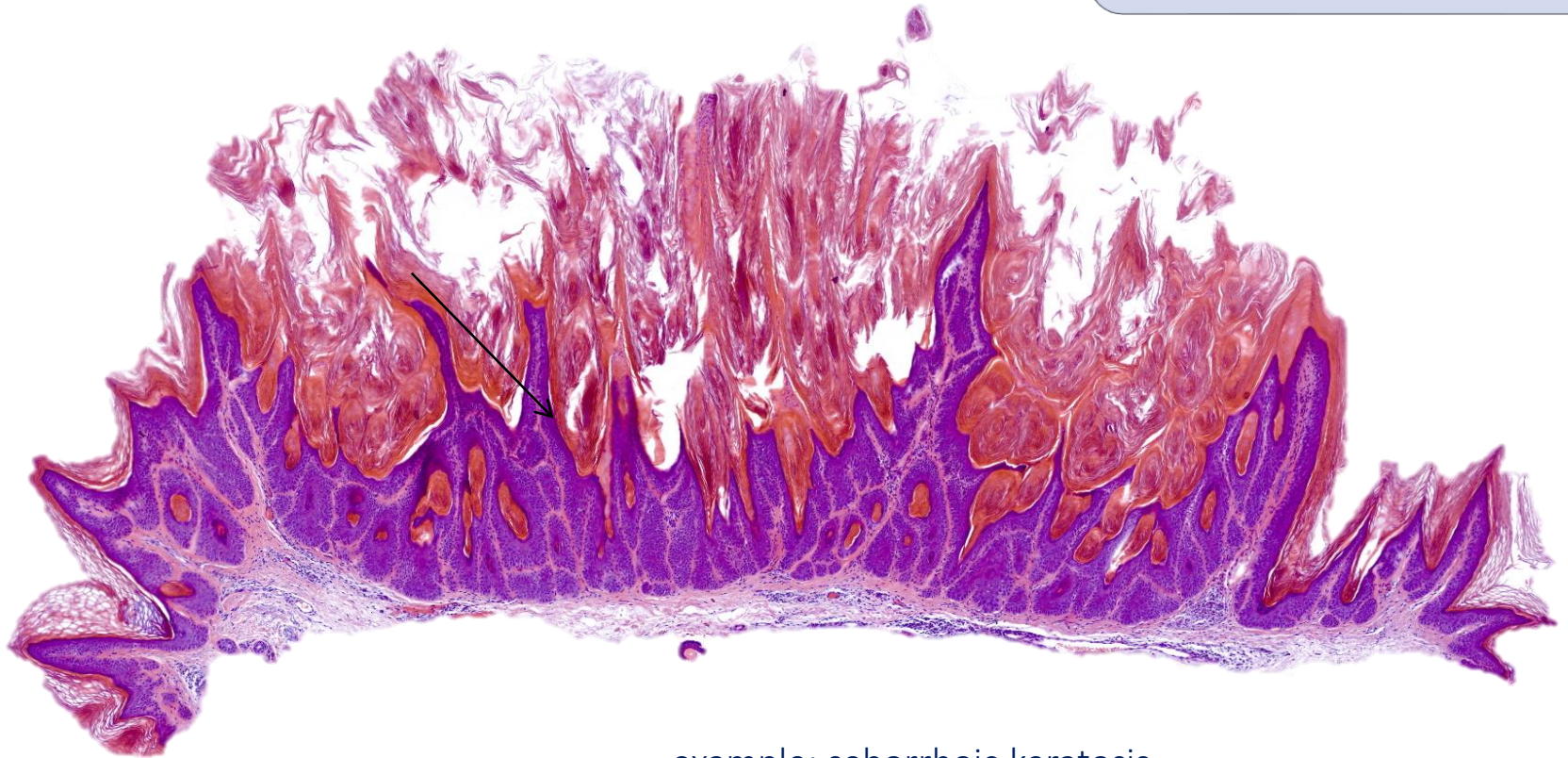
terminology



Papillomatosis

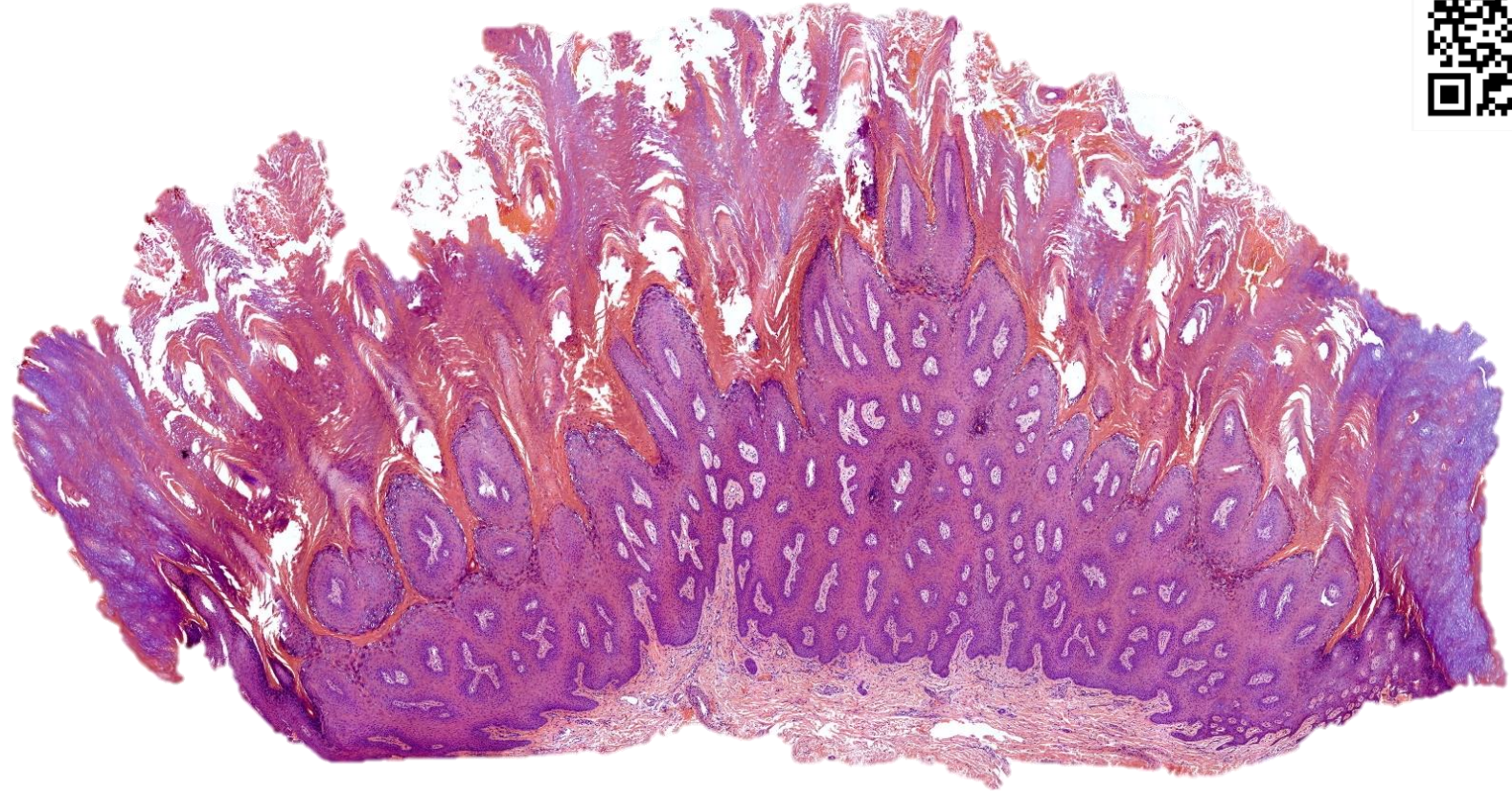
= wart-like proliferation of the epidermis

terminology

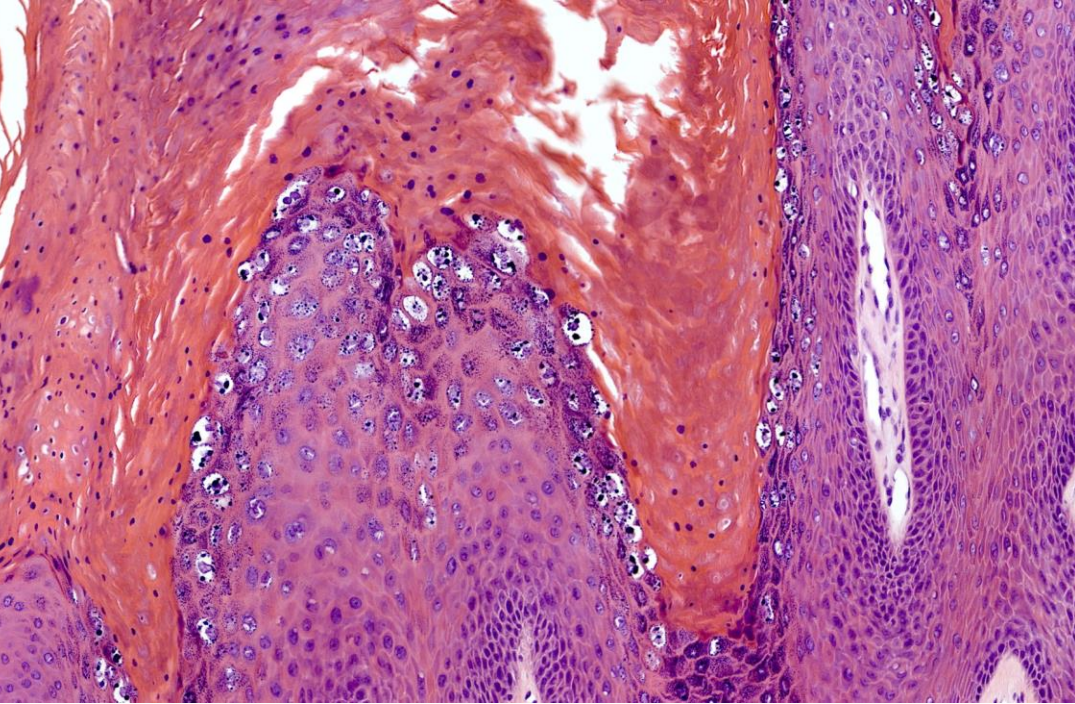


example: seborrheic keratosis

Verruca vulgaris



Verruca vulgaris

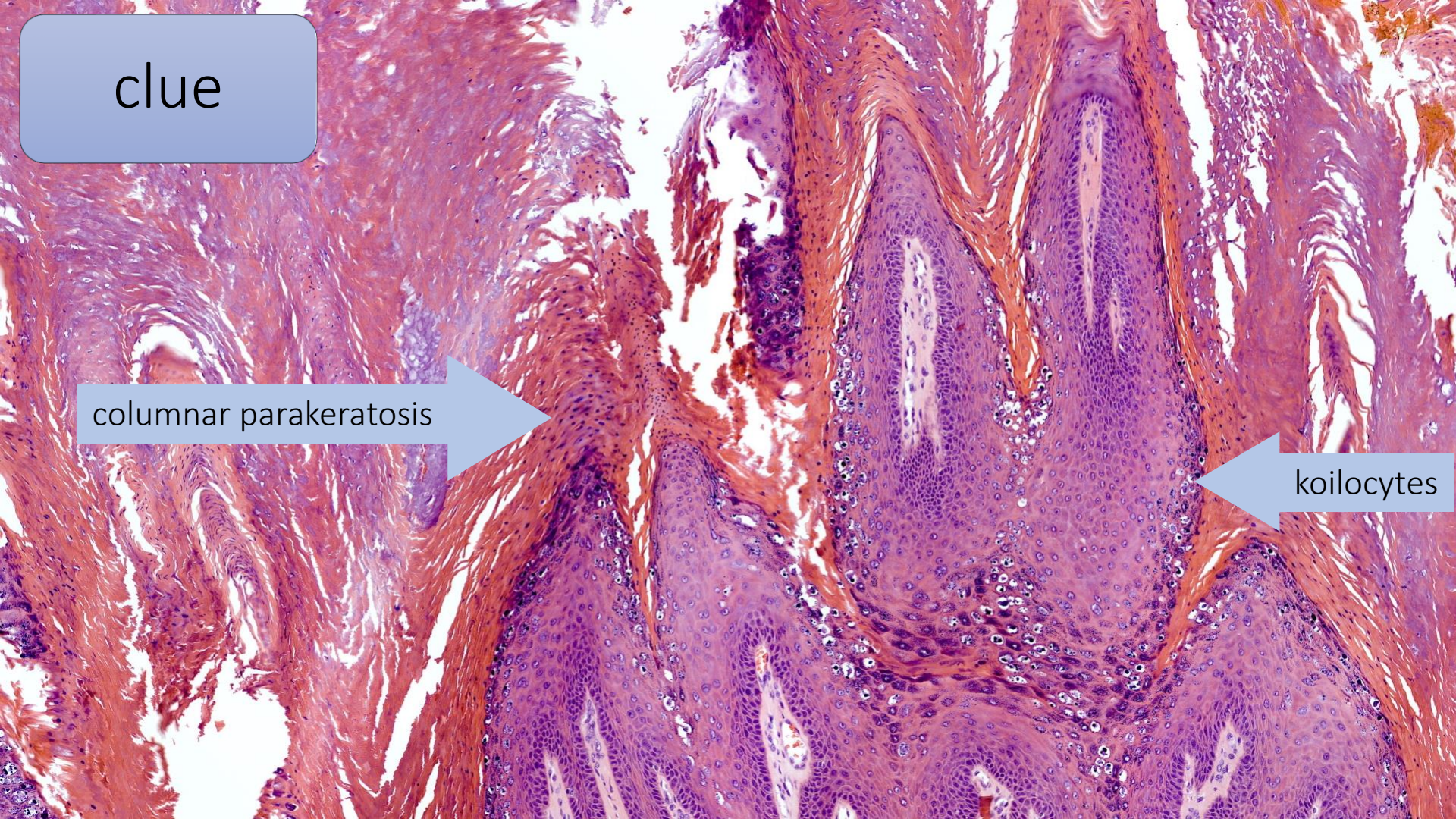


- Papillomatosis (verruciform surface)
- Columnar parakeratosis
- Clumped keratohyalin granules in the str. granulosum
- Koilocytes
- Serum and erythrocyte inclusions in the parakeratosis columns
- No microthrombi in the capillary vessels of the dermal papillae (<-> older textbooks)

clue

columnar parakeratosis

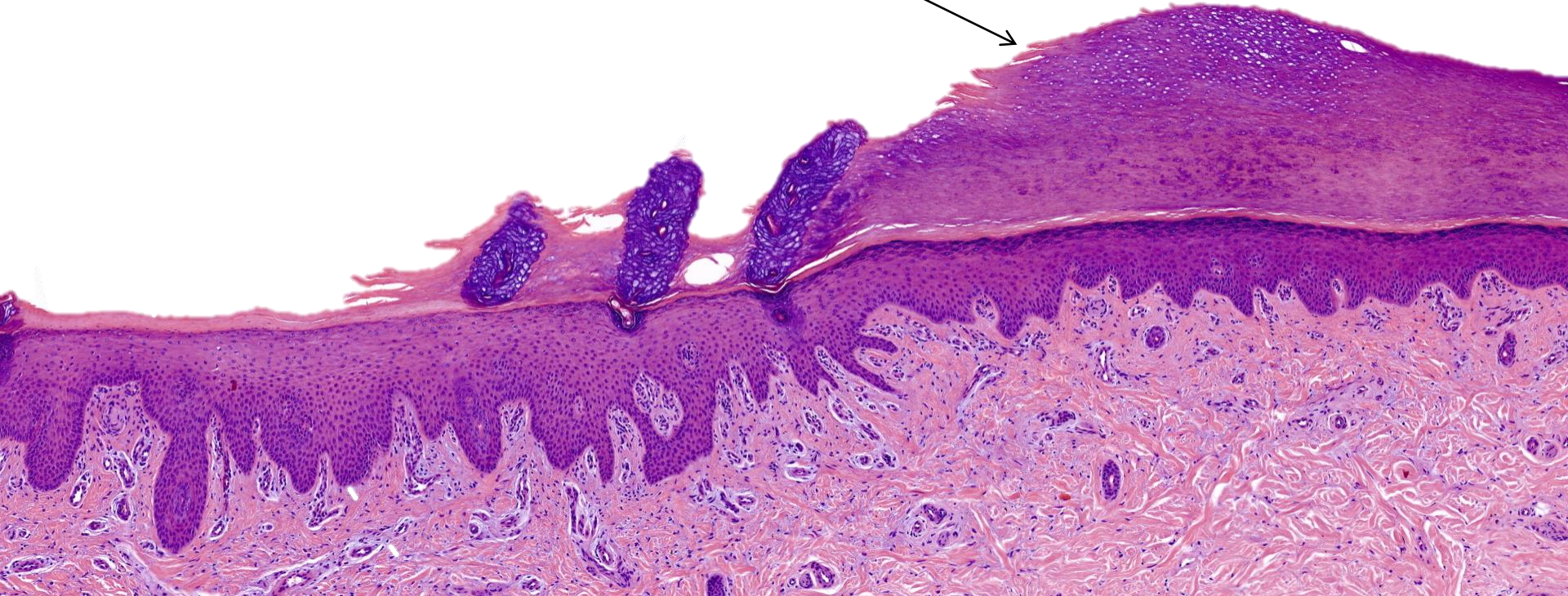
koilocytes



Hyperkeratosis

= increased cornification, thickened stratum corneum

terminology



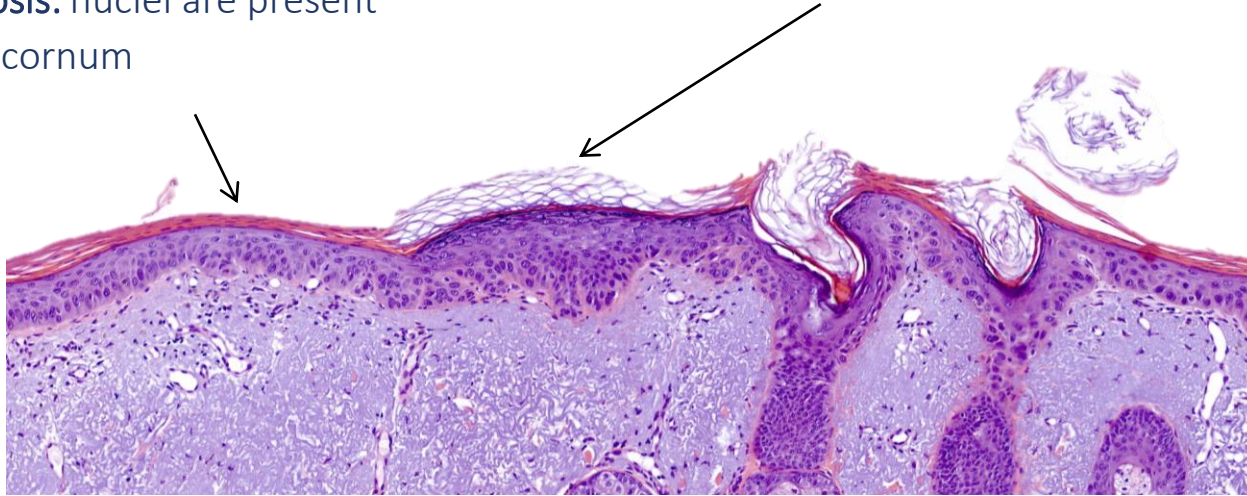
Ortho- and parakeratosis

terminology

Parakeratosis: nuclei are present in the Str. corneum

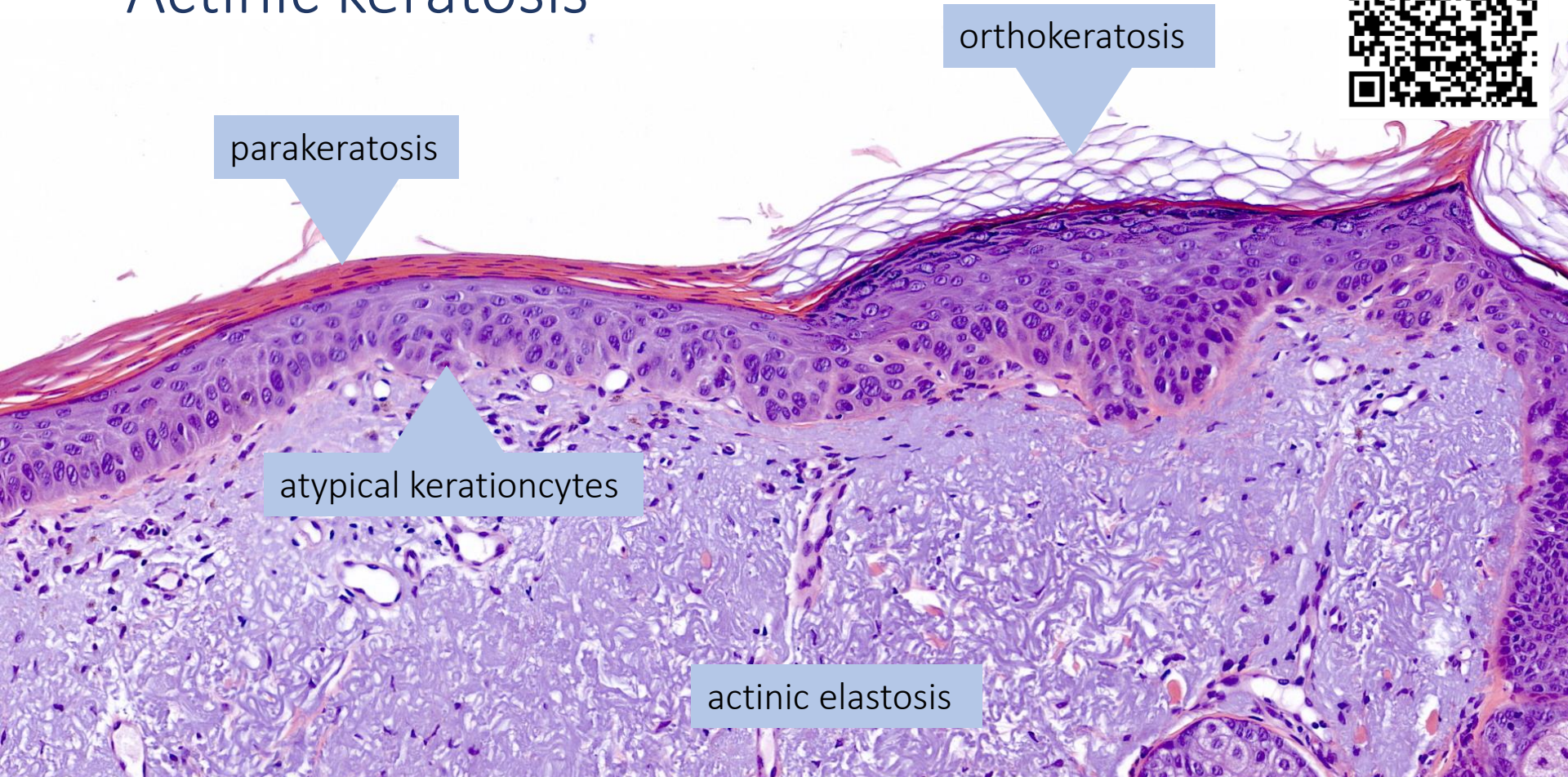
Orthokeratosis: loose lamellar Str. corneum without nuclei

normal
cornification



example: actinic keratosis

Actinic keratosis



parakeratosis

orthokeratosis

atypical keratinocytes

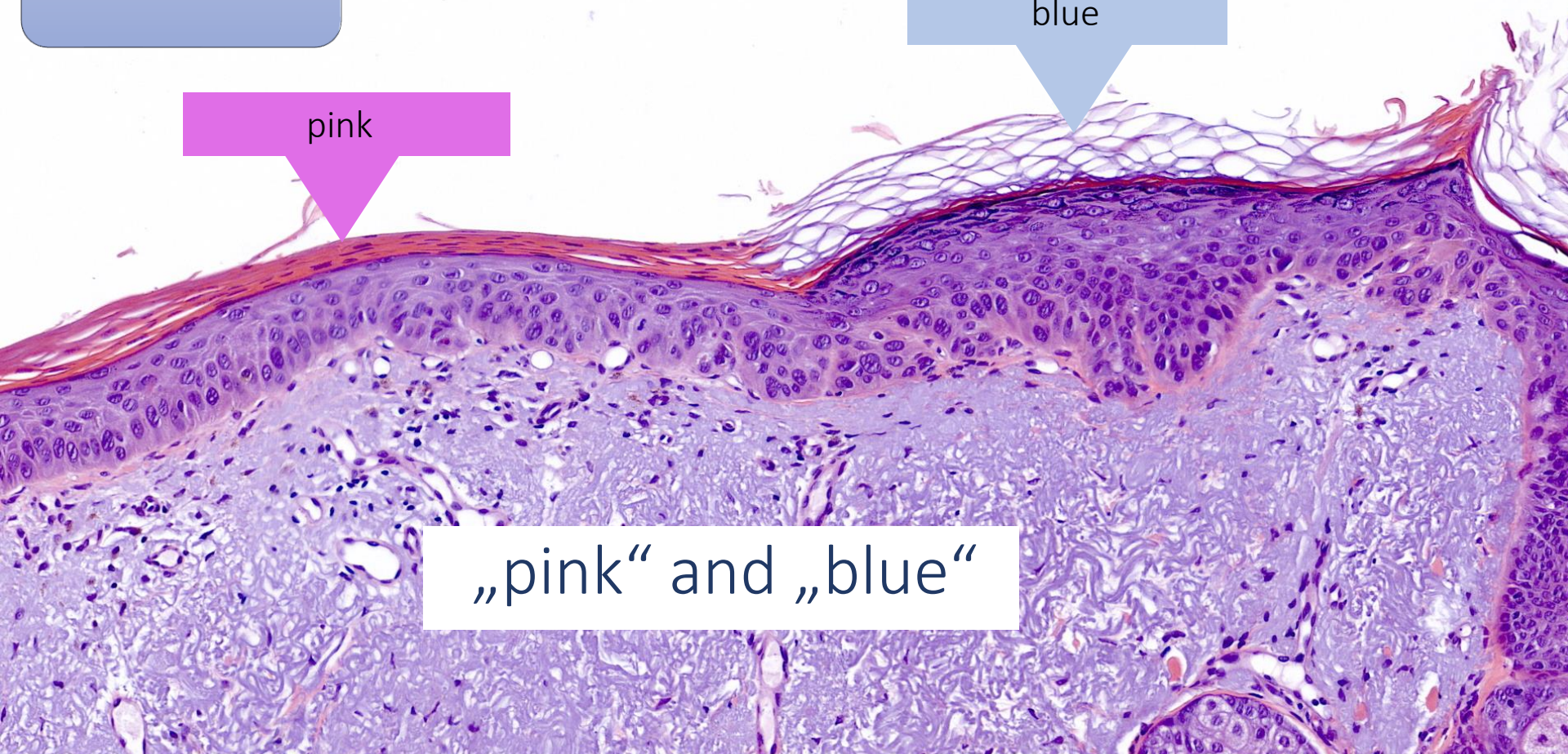
actinic elastosis

clue

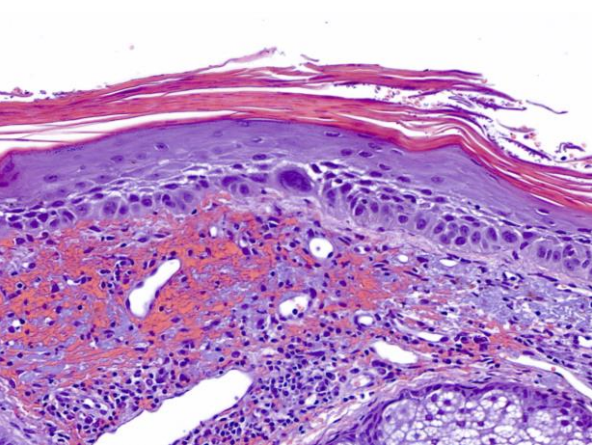
pink

blue

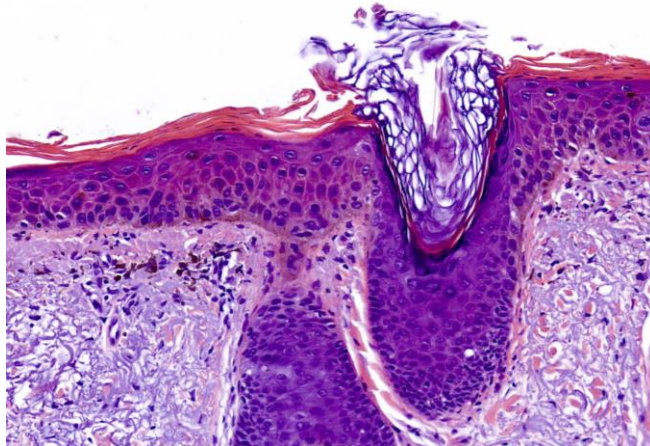
„pink“ and „blue“



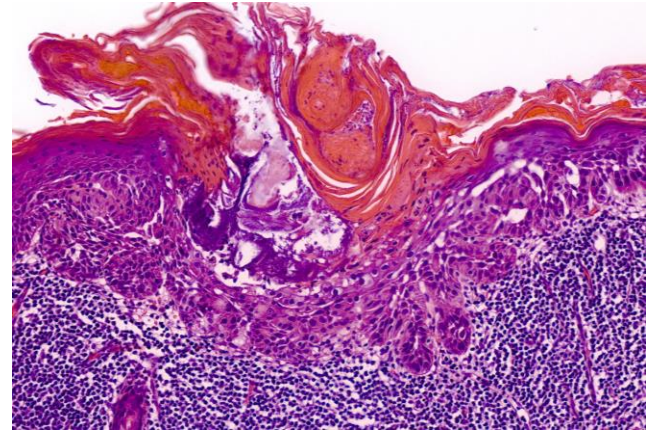
keratinocytic intraepidermal neoplasia (KIN I-III) = AK I-III



AK I = 1/3 epidermis



AK II = 2/3 epidermis



AK III = 3/3 epidermis

Two ways of tumor progression in actinic keratosis

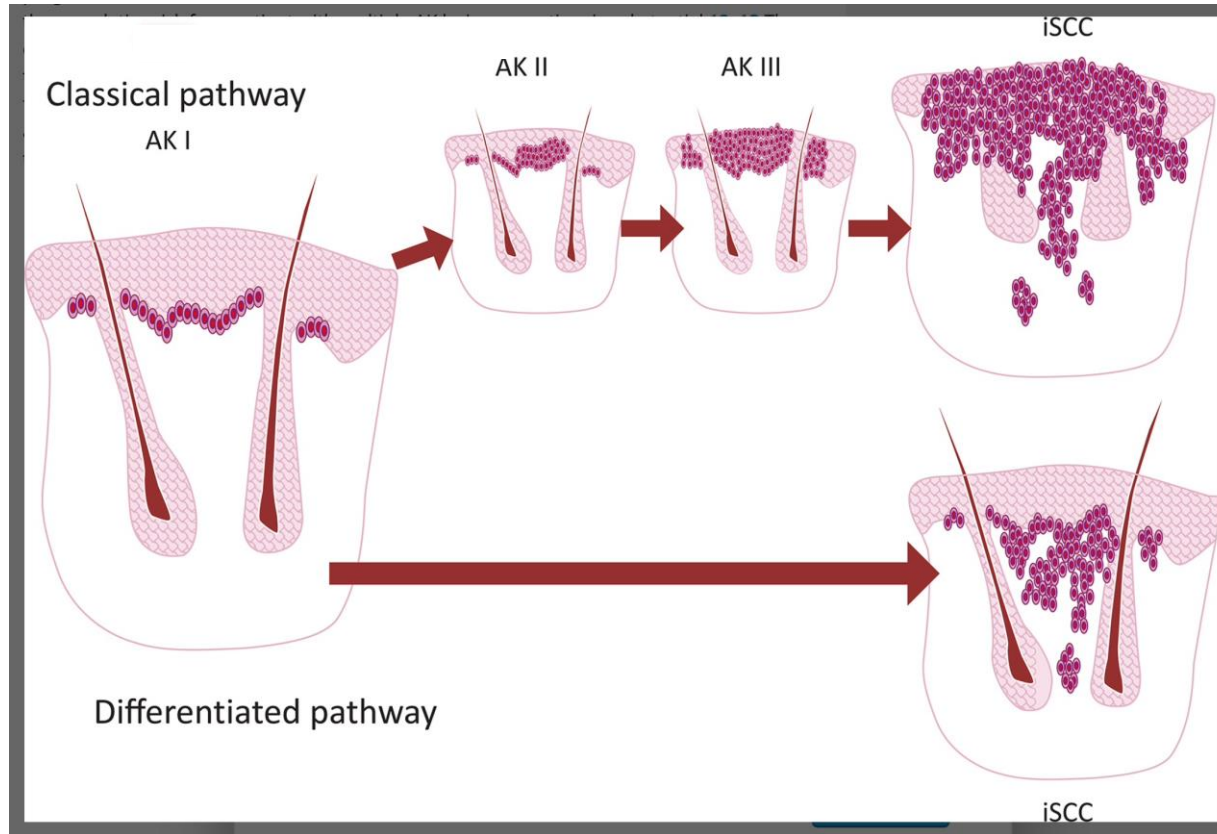
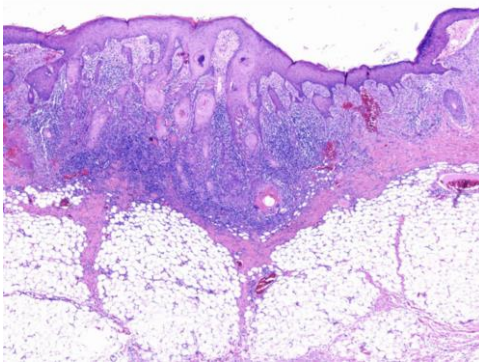


Fig. from Fernandez-Figueras MT From actinic keratosis to squamous cell carcinoma; pathophysiology revisited. JEADV 2017

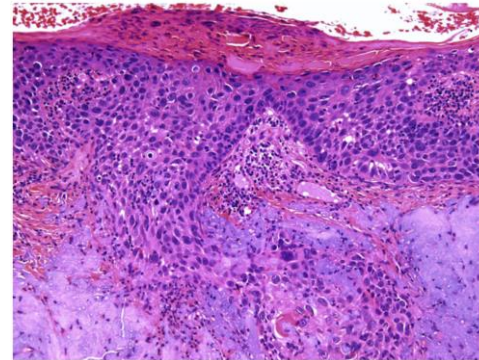
AK I-III and invasive squamous cell carcinoma

	AK I	AK II	AK III	Normal	Not evaluable	Total
Type of lesion overlying iSCC	125 63.8%	35 17.9%	36 18.4%	0	0	196
Type of lesion at iSCC edges	141 77.9%	12 6.6%	15 8.3%	13 7.2%	15 8.1%	196
Foci of ulceration over iSCC	40 32%	10 28.6%	12 33.3%	–	–	62

AK, actinic keratosis; iSCC, invasive squamous cell carcinoma.

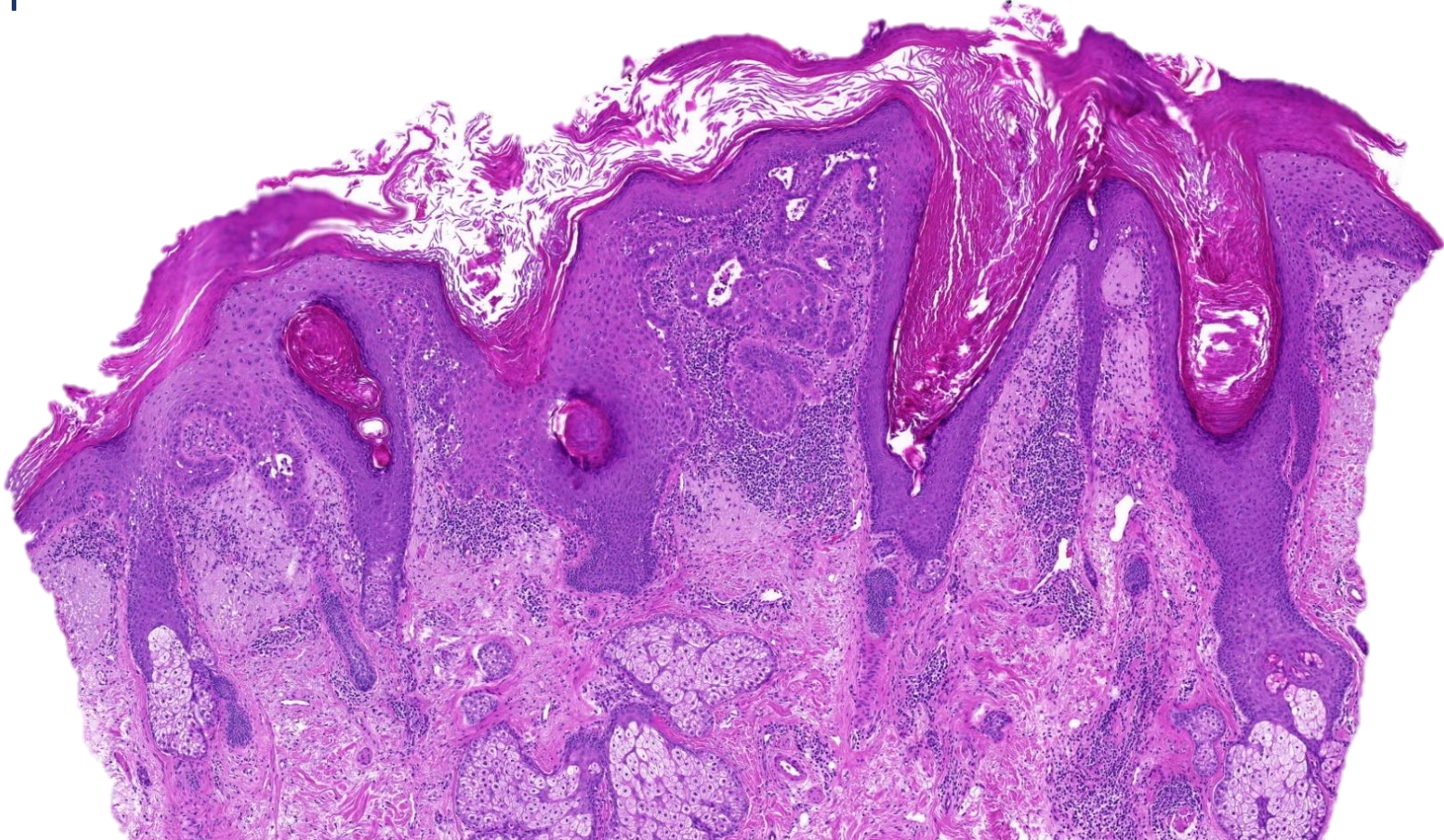


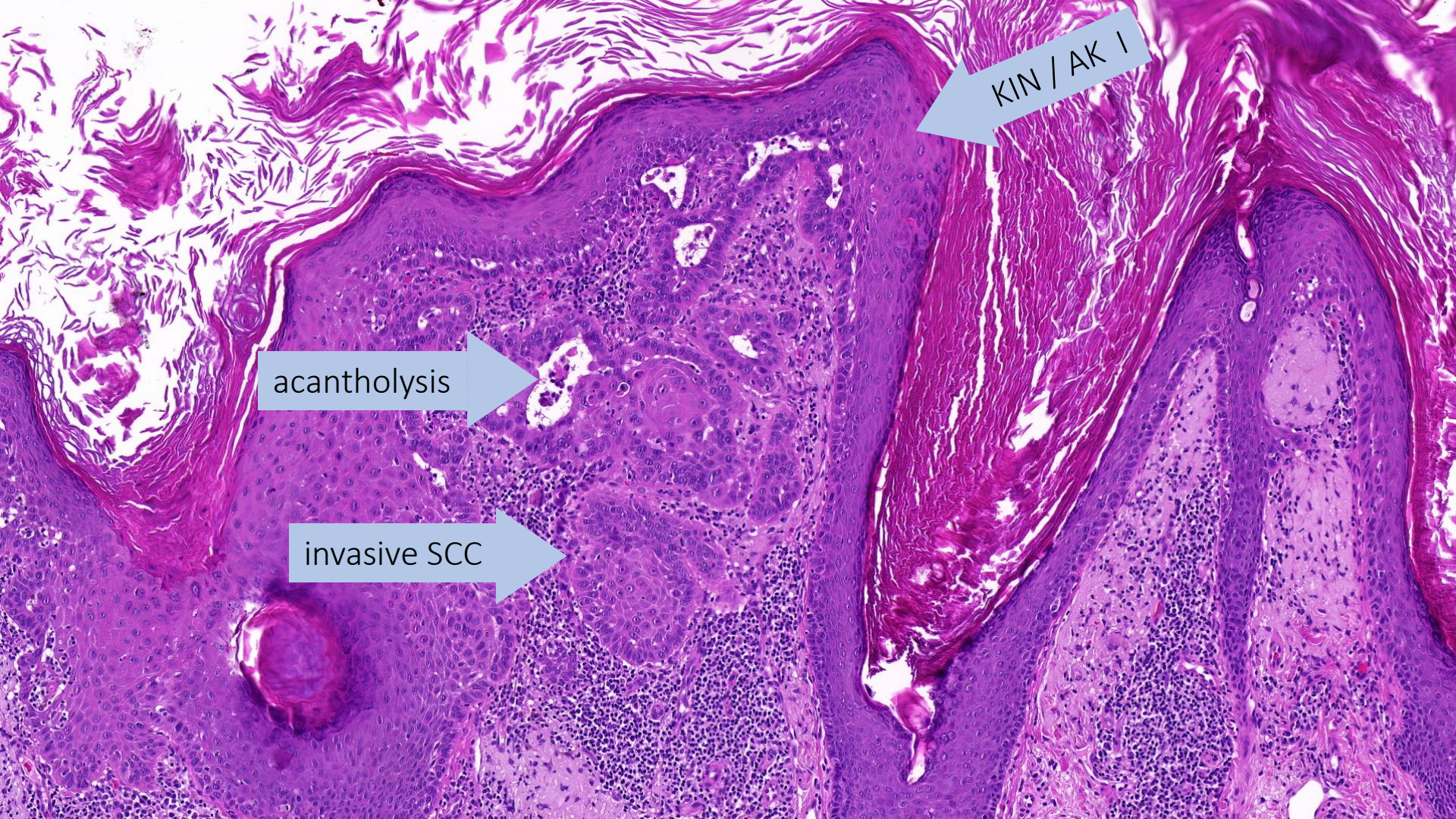
AK I und iSCC



AK III und iSCC

Squamous cell carcinoma





KIN / AK I

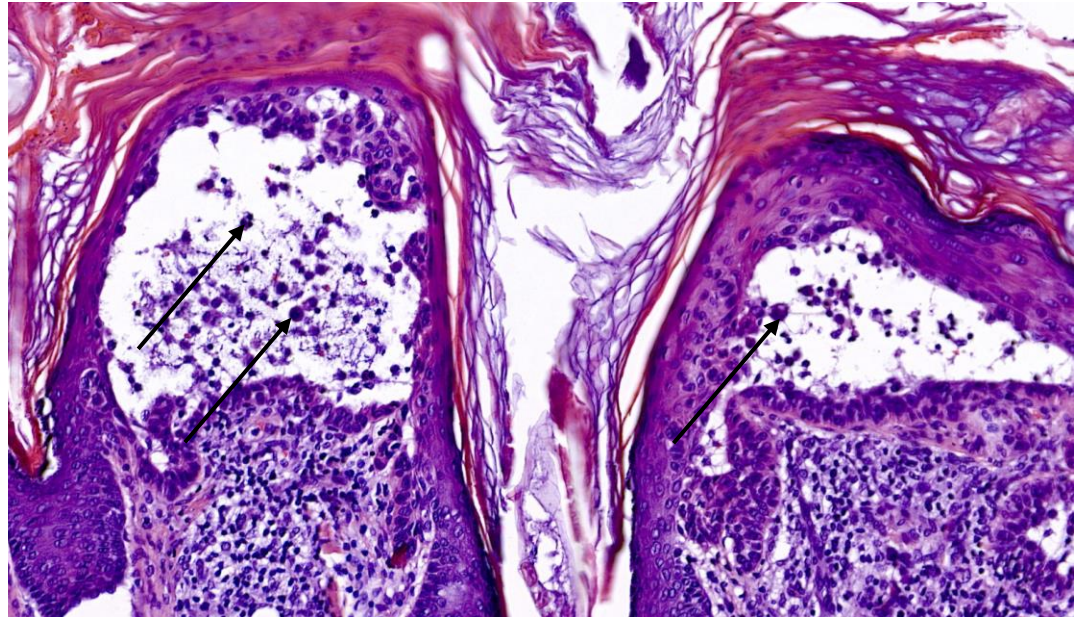
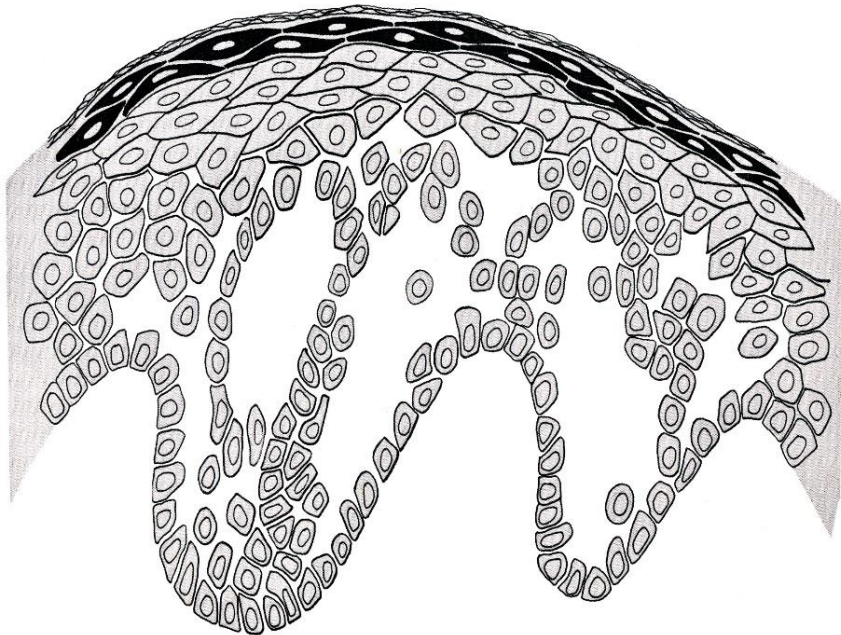
acantholysis

invasive SCC

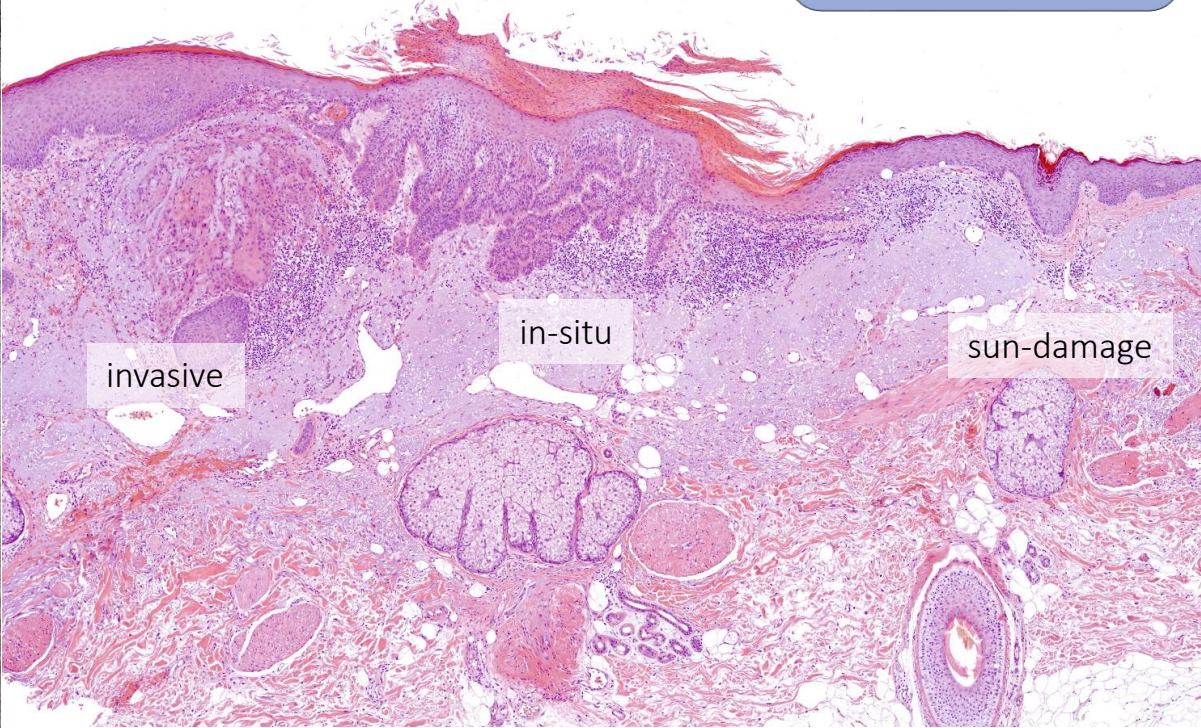
Acantholysis

terminology

= rounding and loss of cohesion between keratinocytes, loss of intercellular bridges (desmosomes)

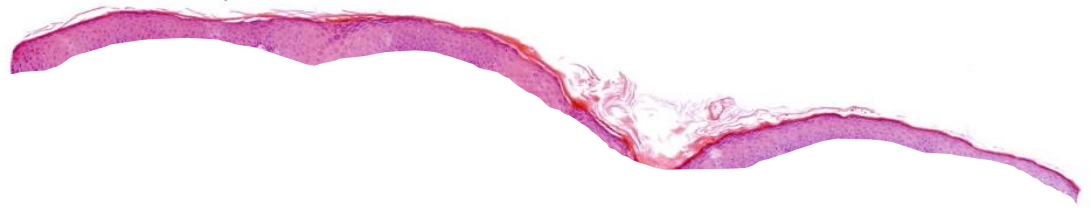


tumours

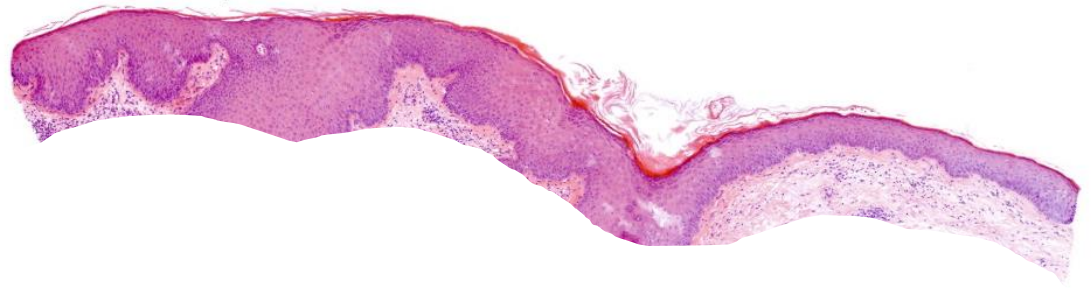


The area of the biopsy is essential!

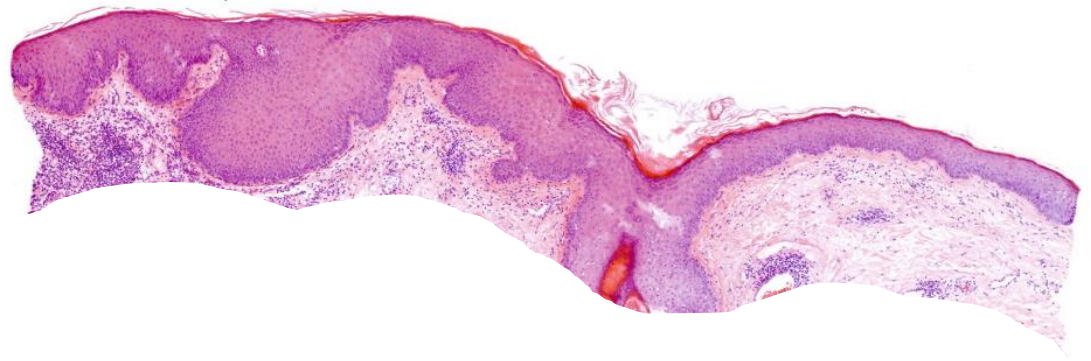
Problem
Superficial biopsy



Problem
Superficial biopsy



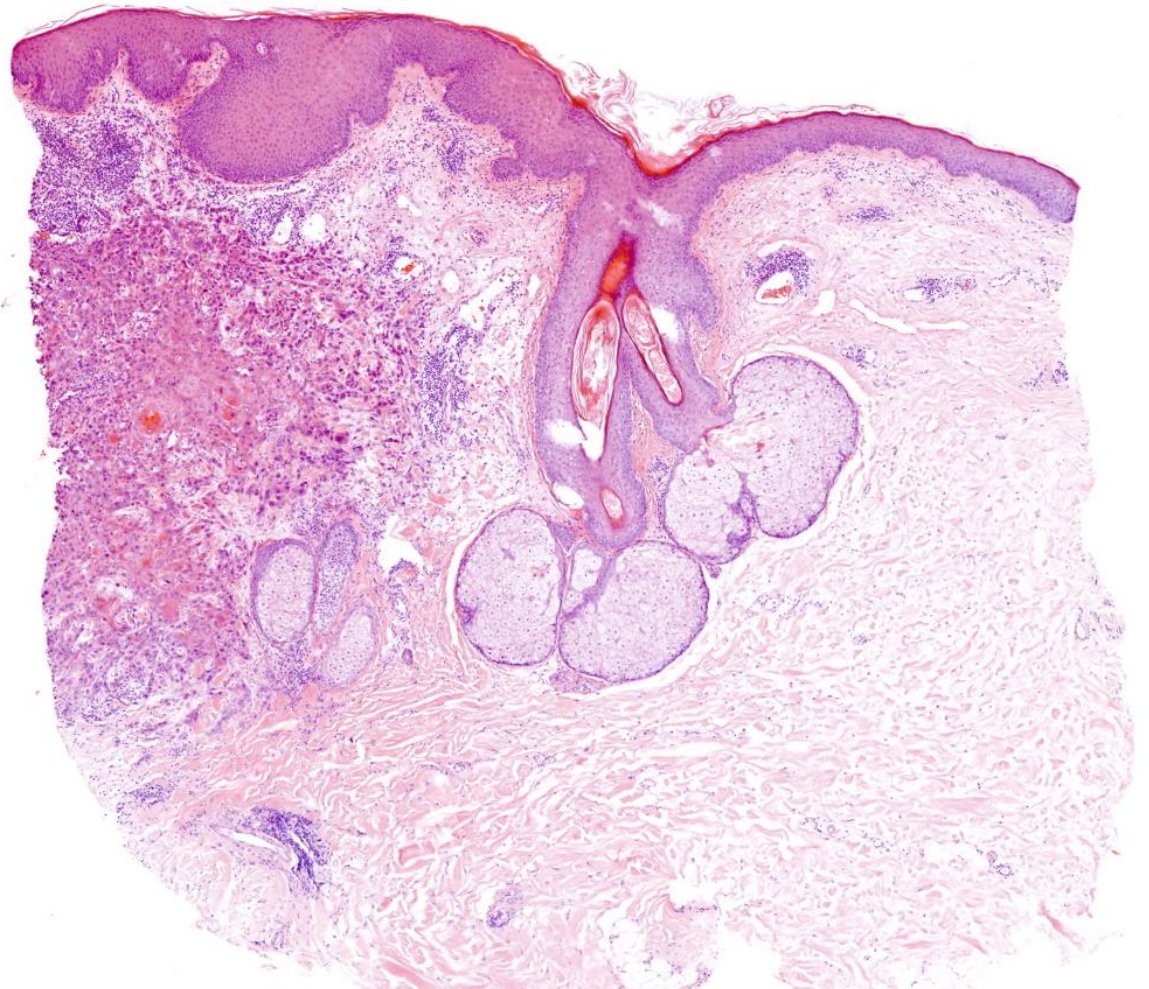
Problem
Superficial biopsy



Problem

Superficial biopsy

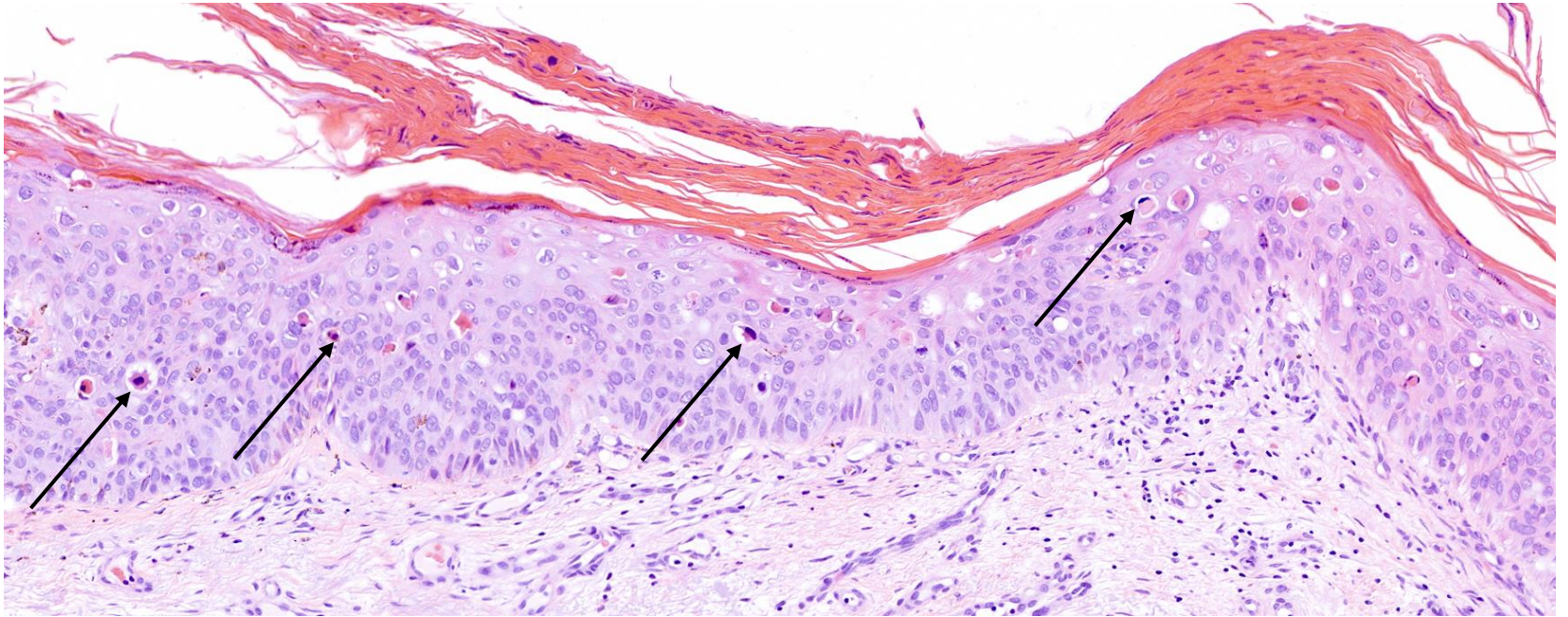
In superficial biopsies,
invasive tumor
growth cannot be
excluded!



Dyskeratosis

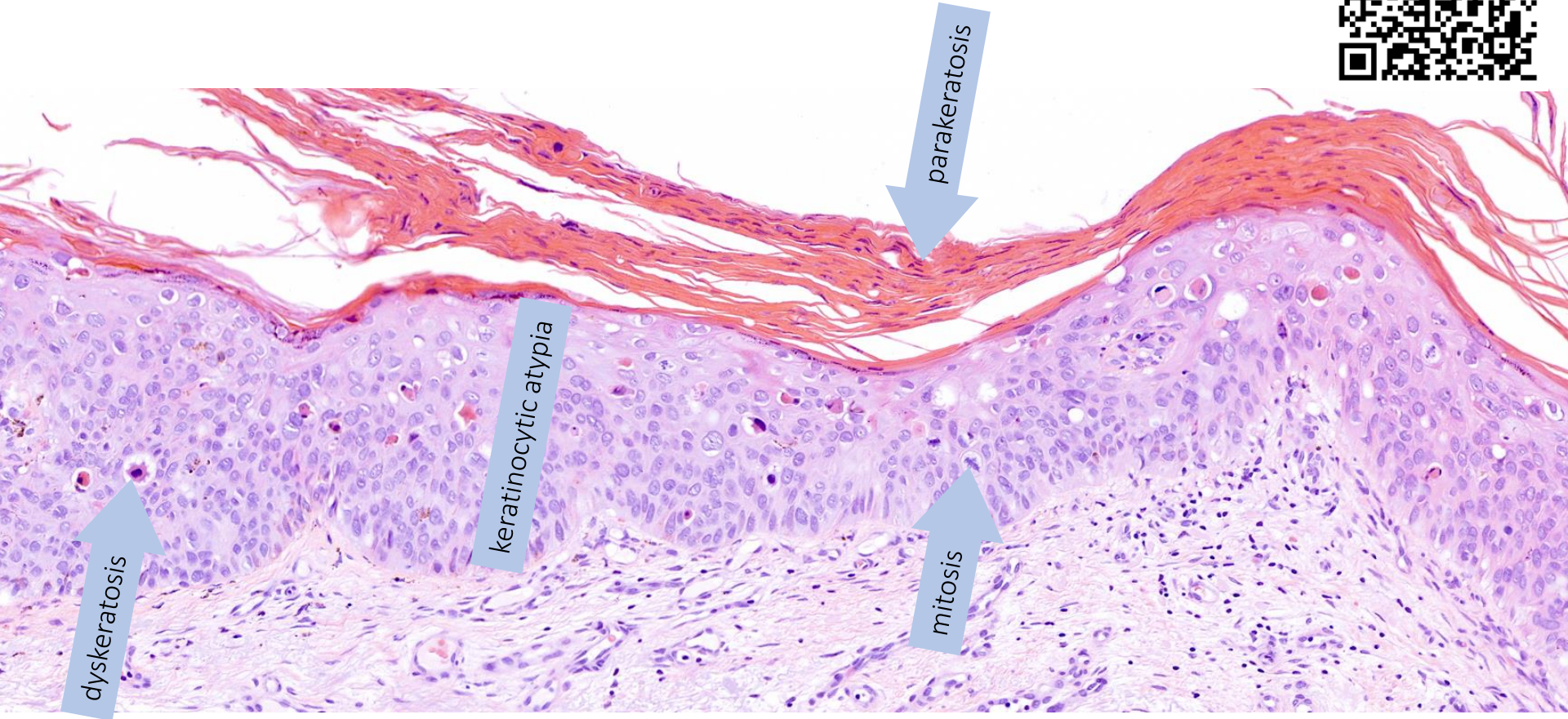
= imperfect keratinization with shrunken and intensely eosinophilic cytoplasm and dense basophilic remnants of nuclei

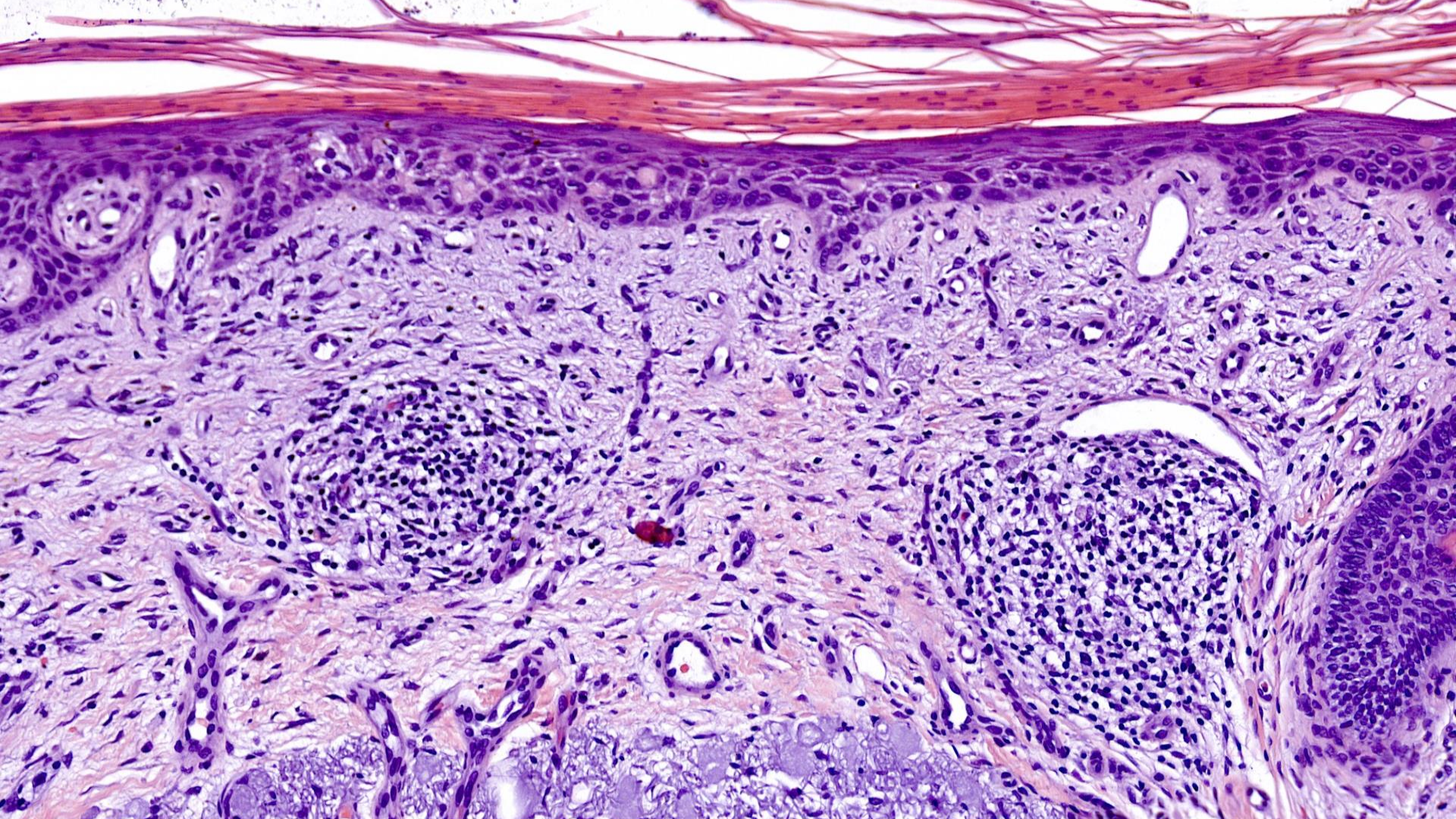
terminology



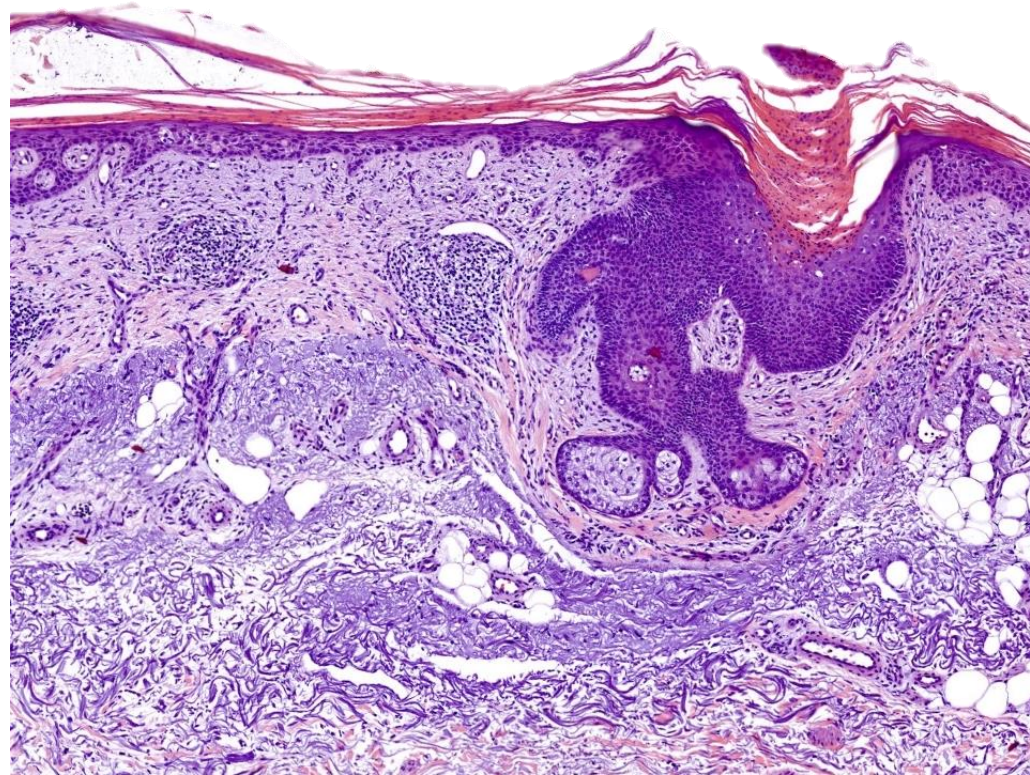
example: Bowen's disease

Bowen's disease





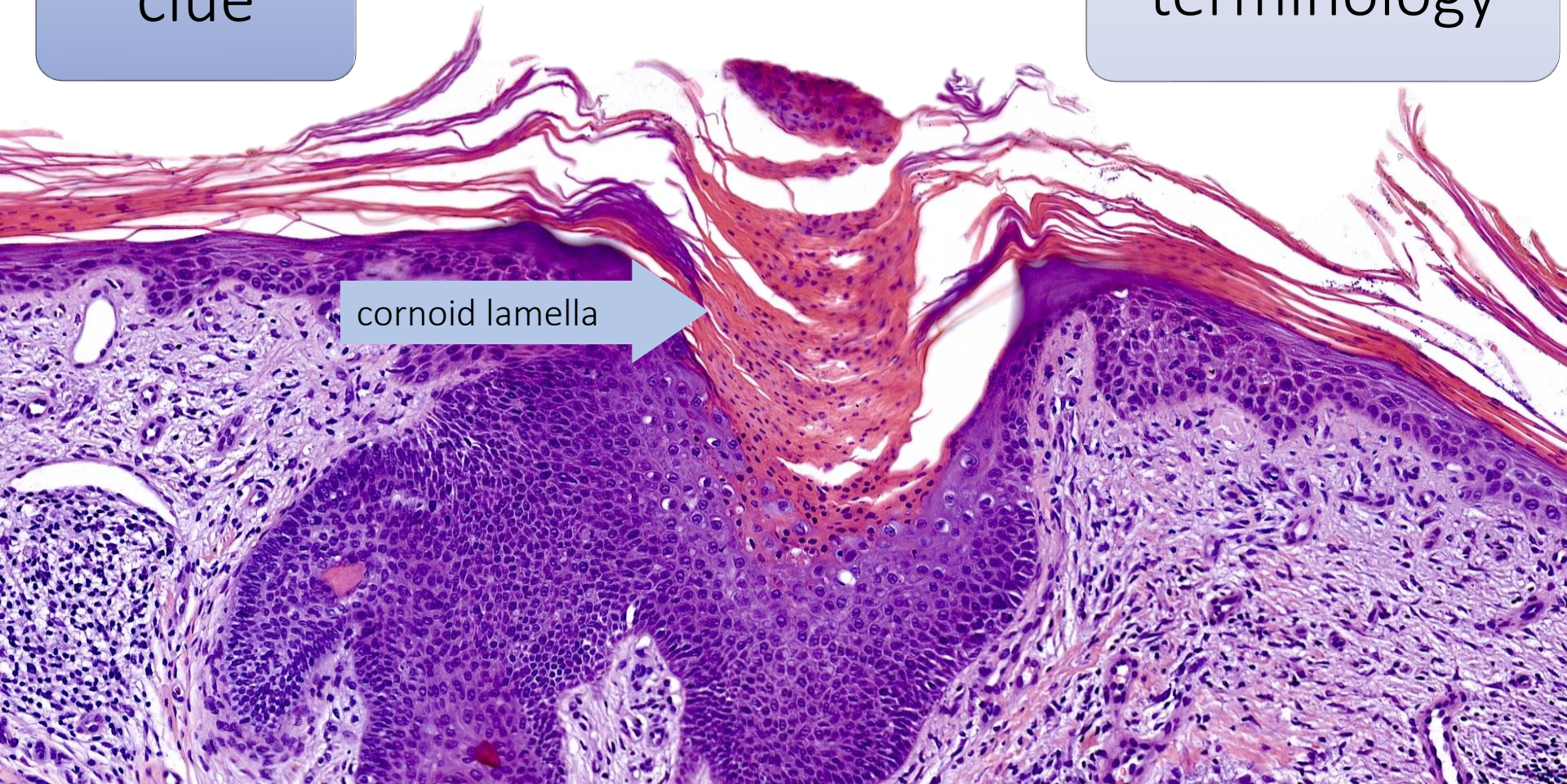
Porokeratosis superficialis disseminata actinica



clue

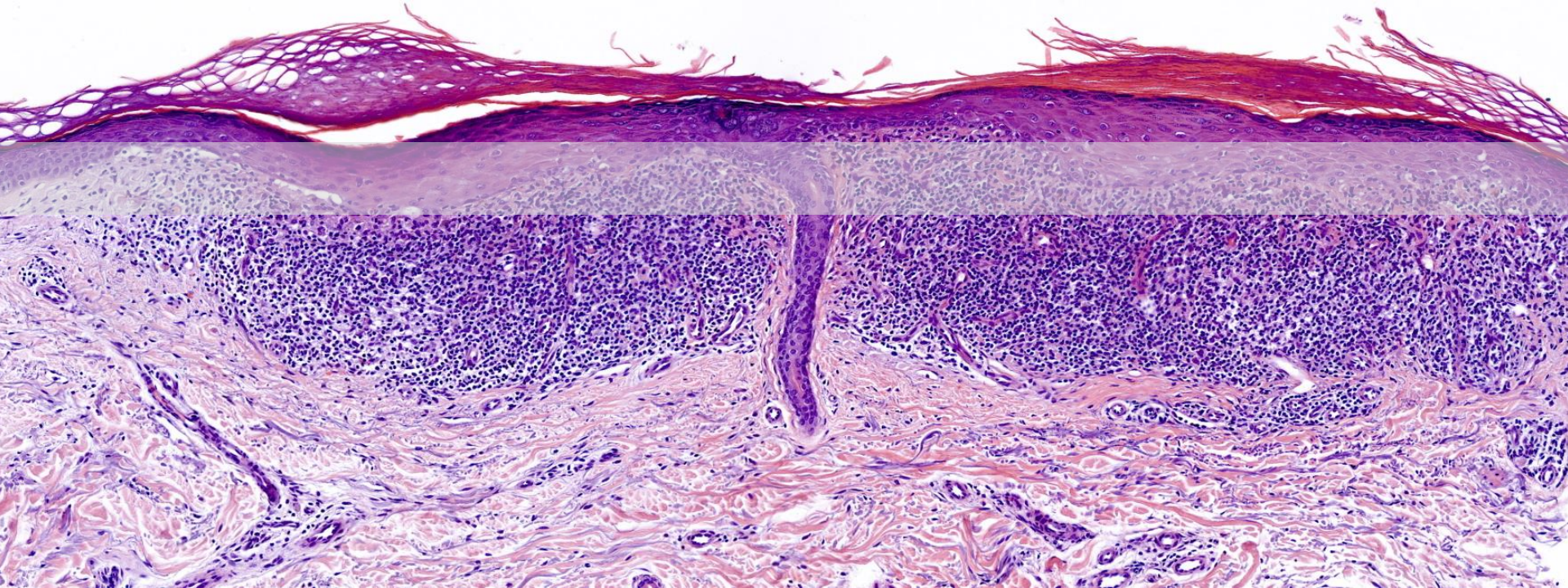
terminology

cornoid lamella



Interface dermatitis

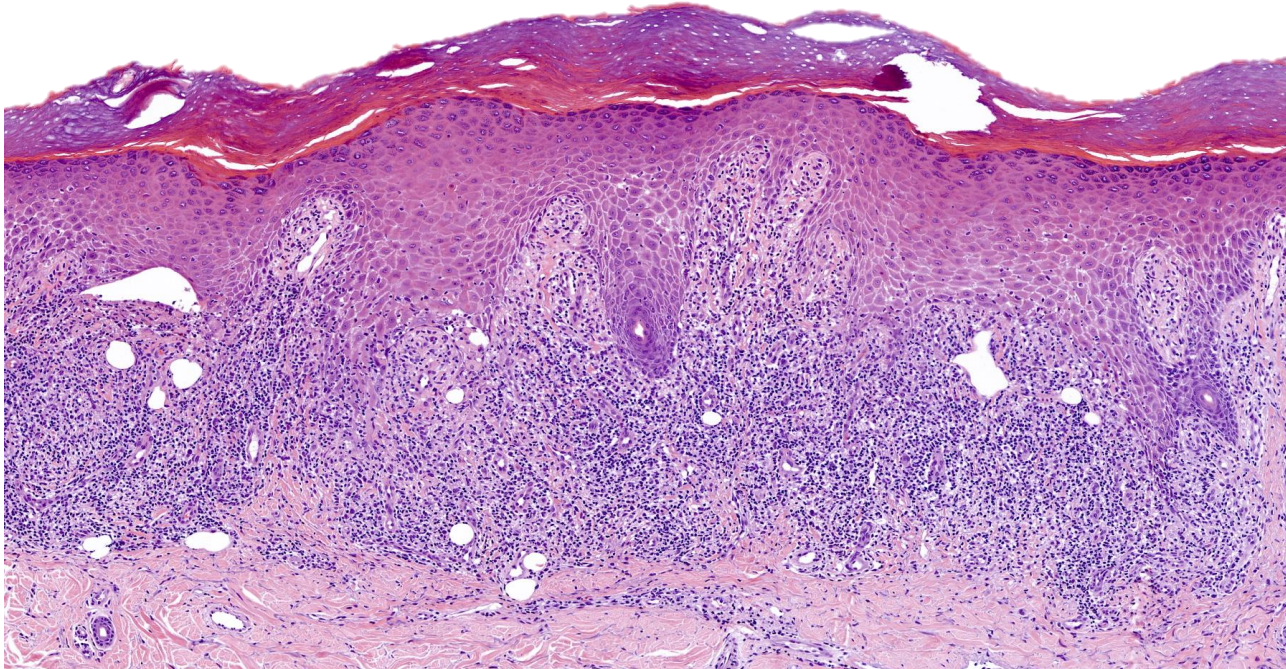
= Immune cells (often lymphocytes) attacks the interface between the epidermis and the upper dermis. Typically with damage of the basal layers of the epidermis.



pattern

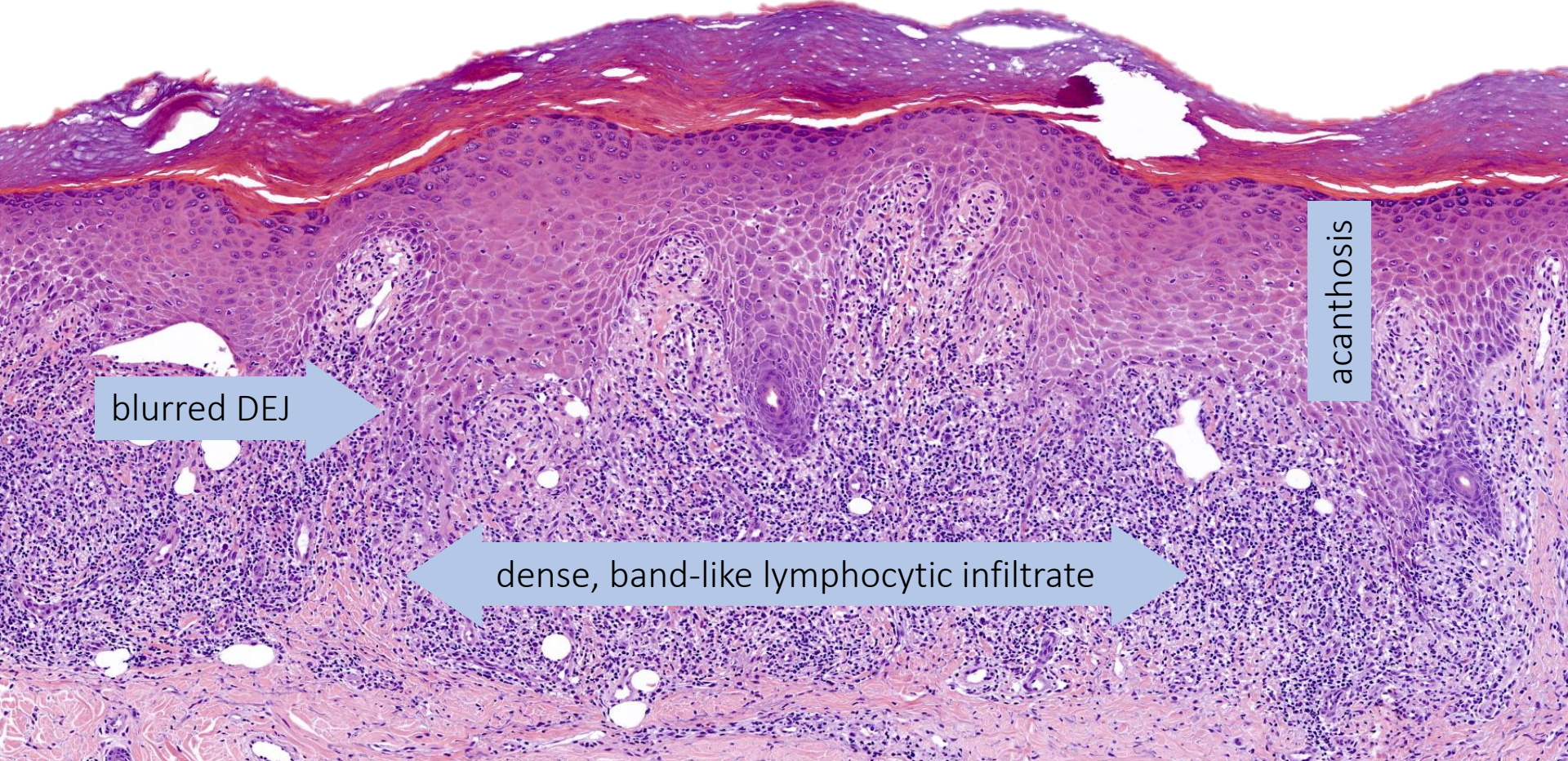
Lichenoid interface dermatitis

= dense band-like infiltrate of lymphocytes in the dermoepidermal junction (DEJ)



example: Lichen planus

Lichen planus



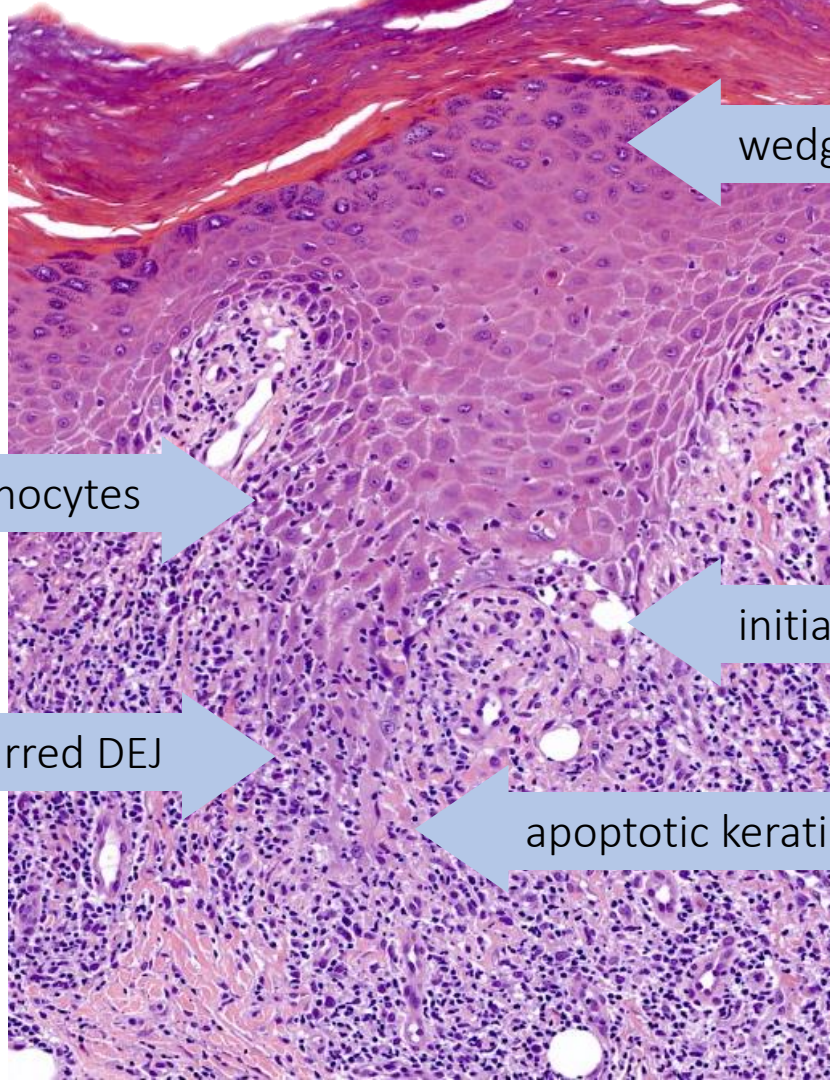
blurred DEJ

acanthosis

dense, band-like lymphocytic infiltrate



Lichen planus



wedge-shaped str. granulosum

infiltration of lymphocytes

initial subepidermal blistering

Max-Joseph cleft

blurred DEJ

apoptotic keratinocytes

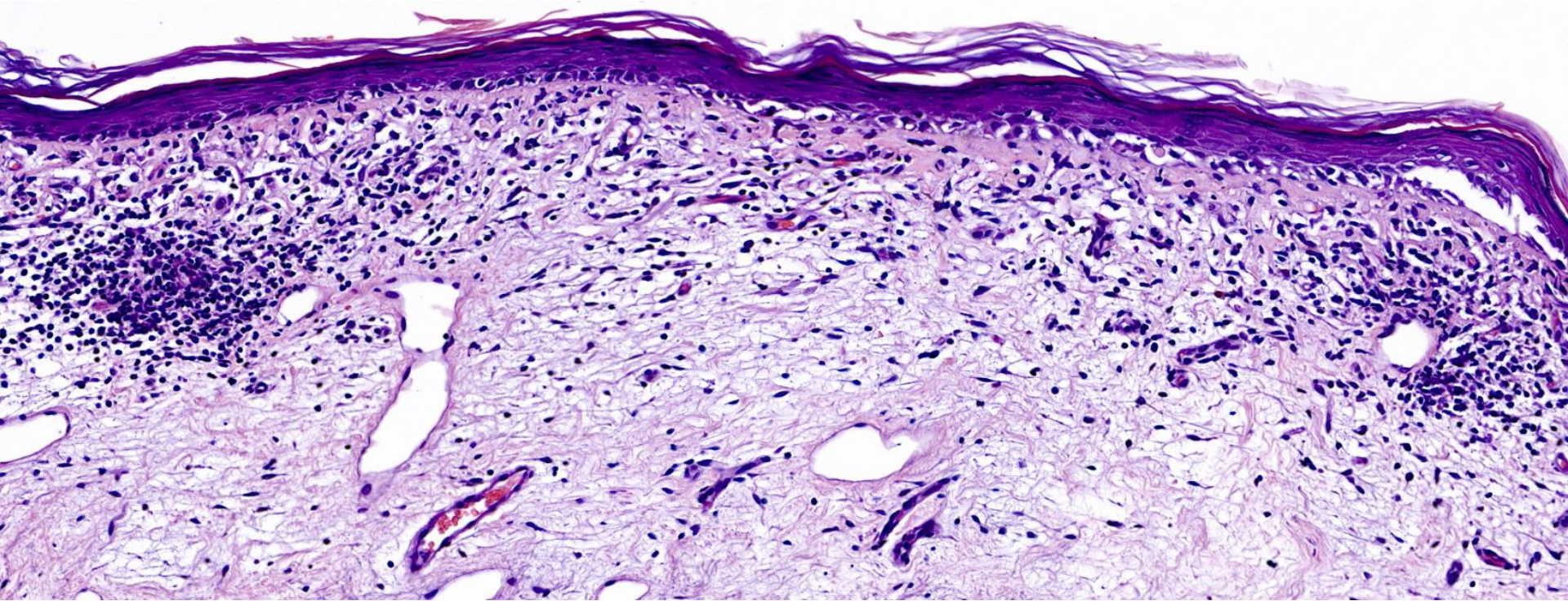
cadaveric keratinocytes

the rete ridges
reminds to saw teeth

Vacuolar interface dermatitis

= vacuolization of the basal layers of the epidermis

pattern

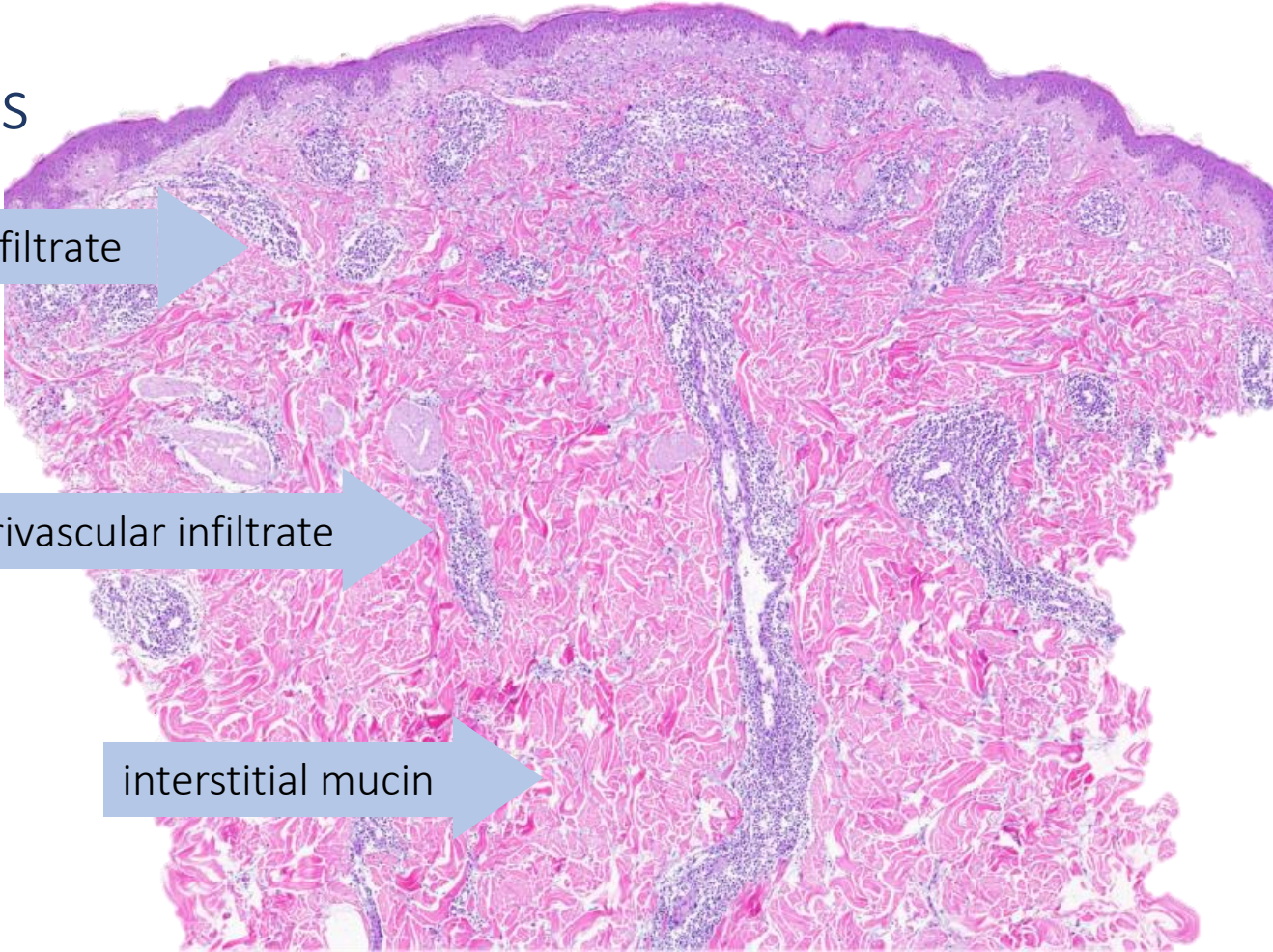


Lupus erythematosus

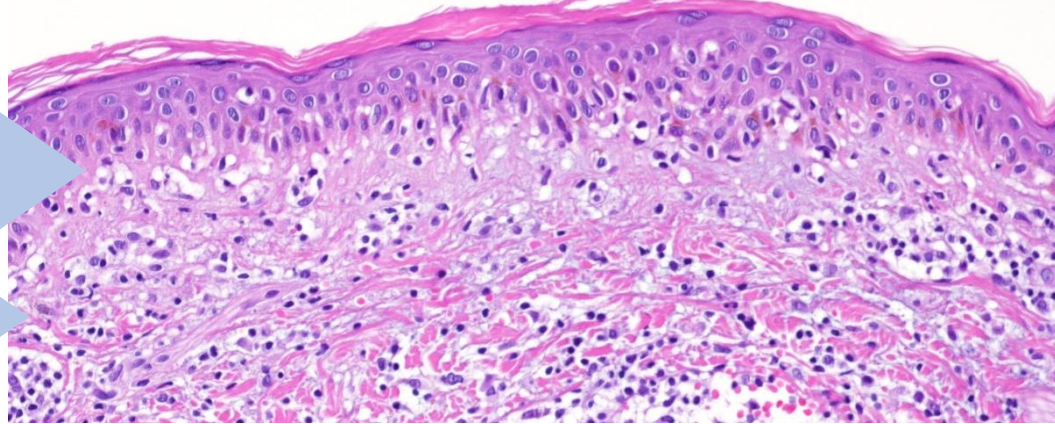
superficial perivascular infiltrate

deep perivascular infiltrate

interstitial mucin

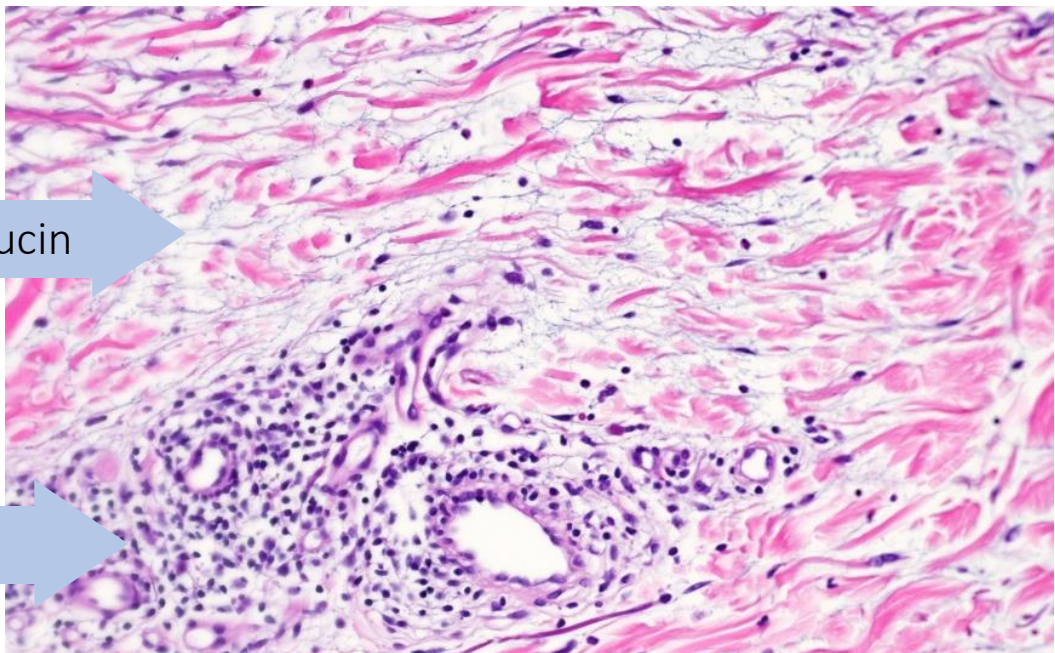


vacuolar alteration

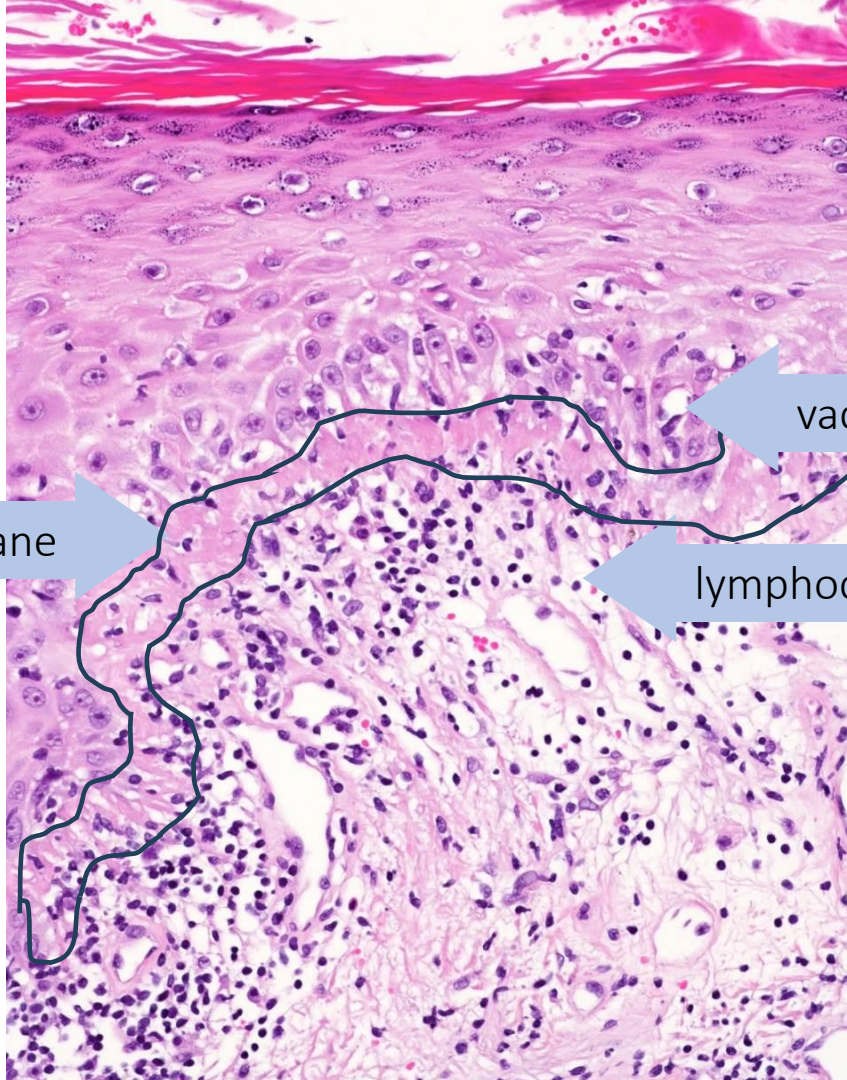


moderate lymphocytic infiltrate

interstitial mucin



perivascular lymphocytic infiltrate



thickened basal membrane

vacuolar alteration

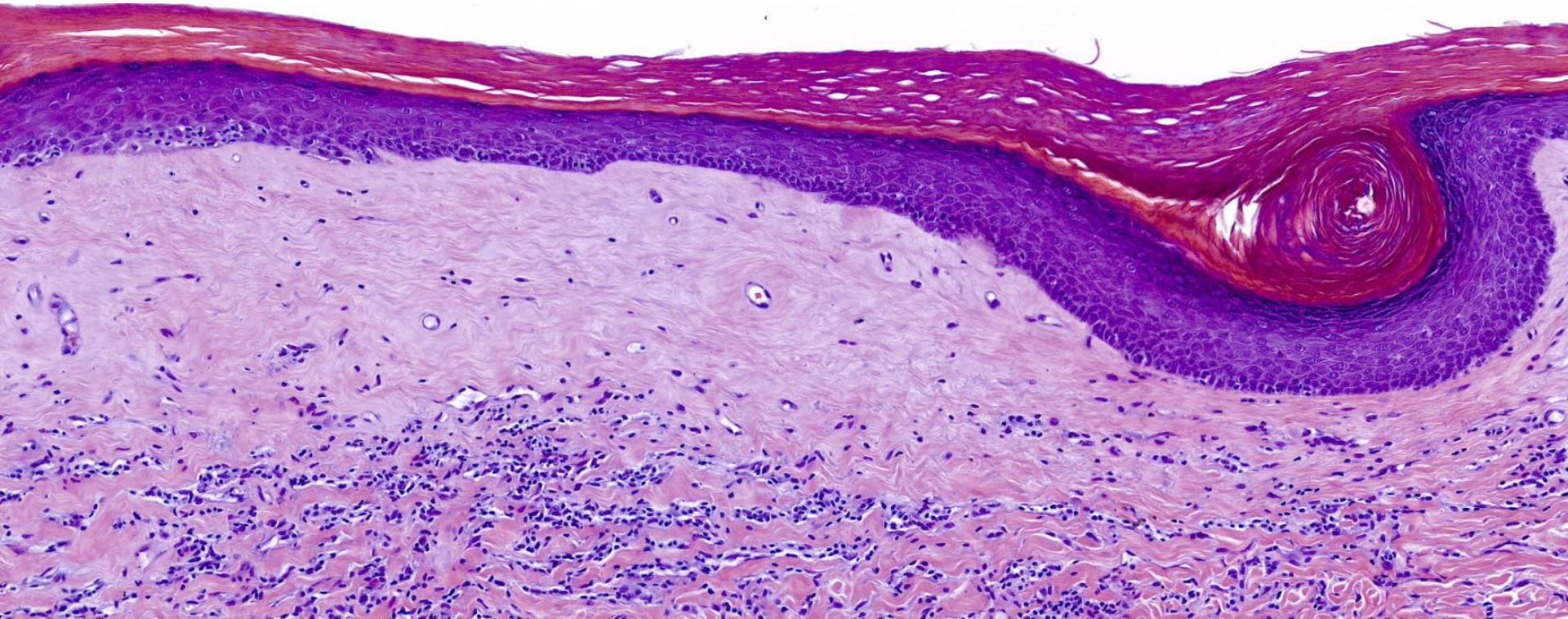
lymphocytes

Atrophy

= decreased thickness of the epidermis / dermis

terminology

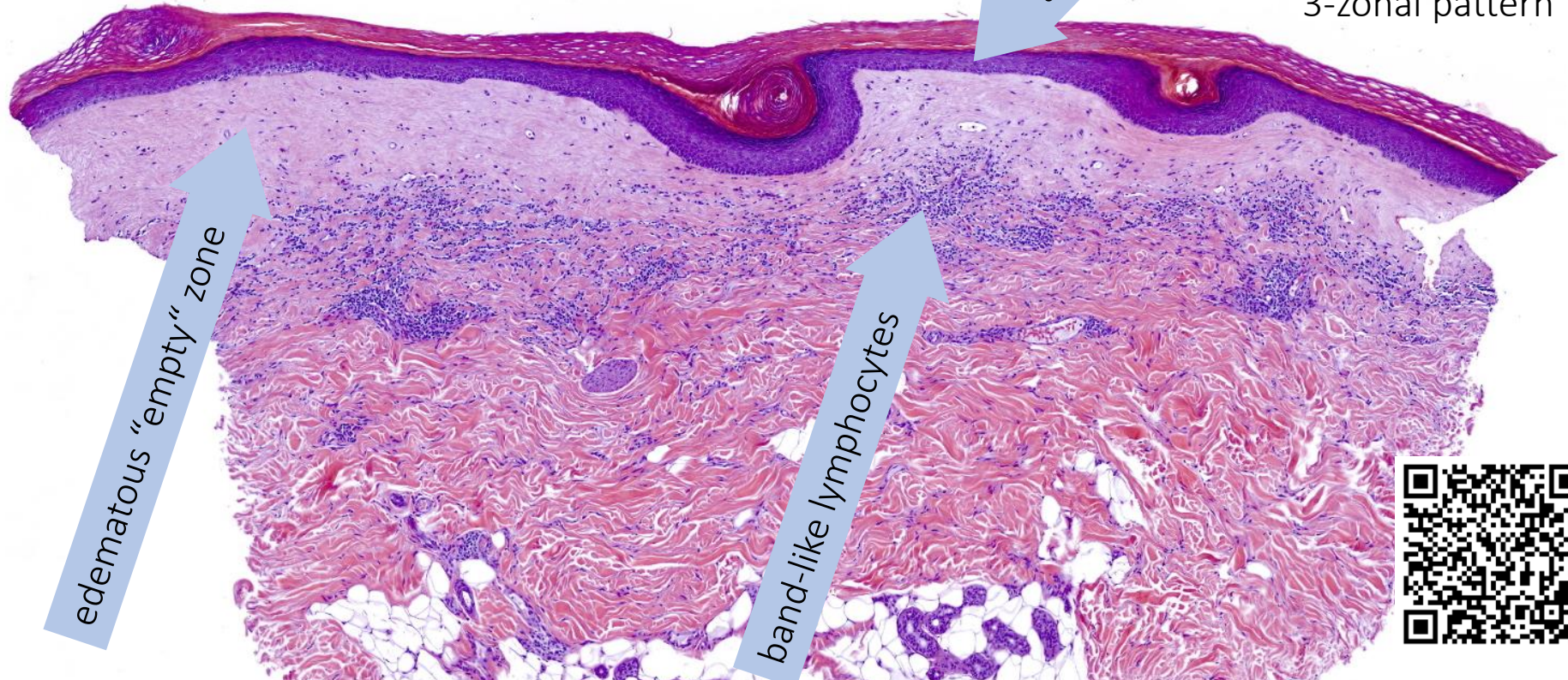
example: Lichen sclerosus et atrophicus



Lichen sclerosus et atrophicus

clue

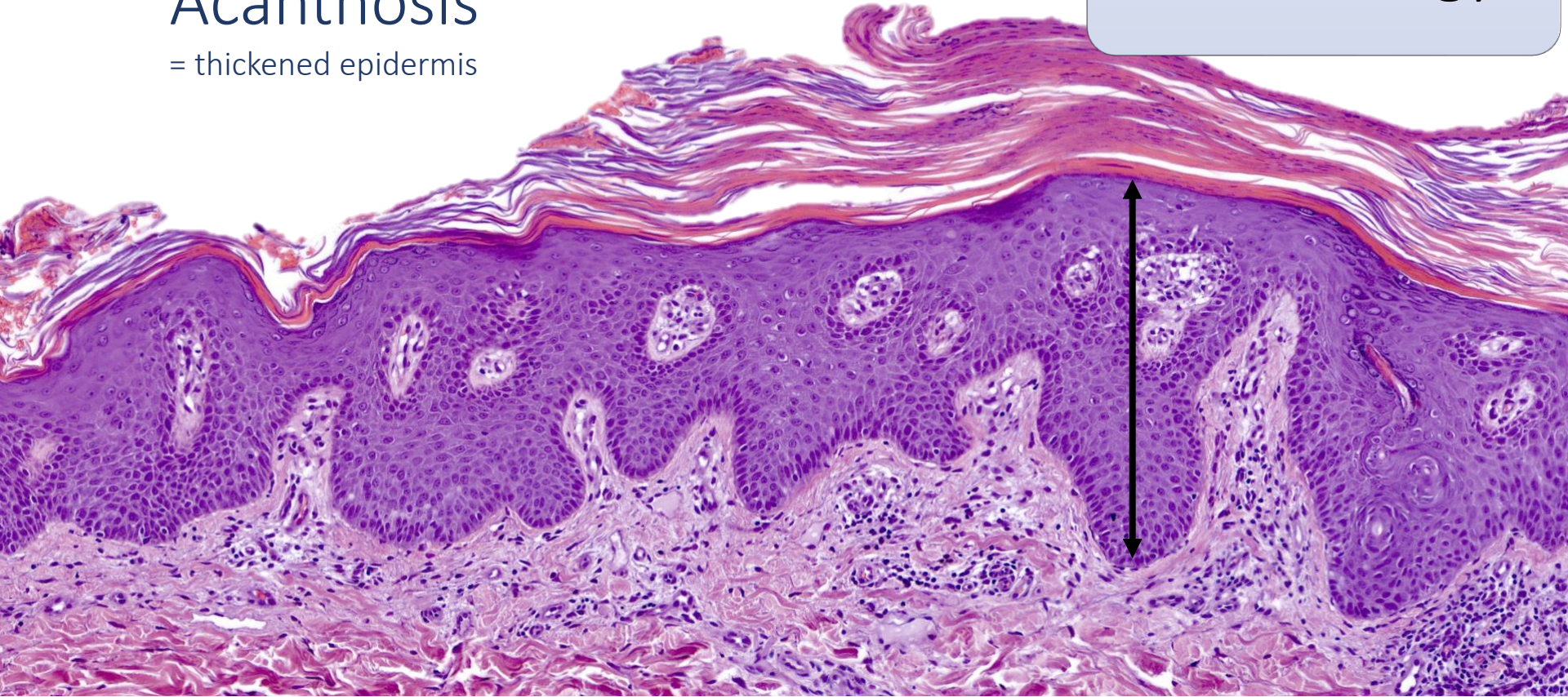
3-zonal pattern



Acanthosis

= thickened epidermis

terminology

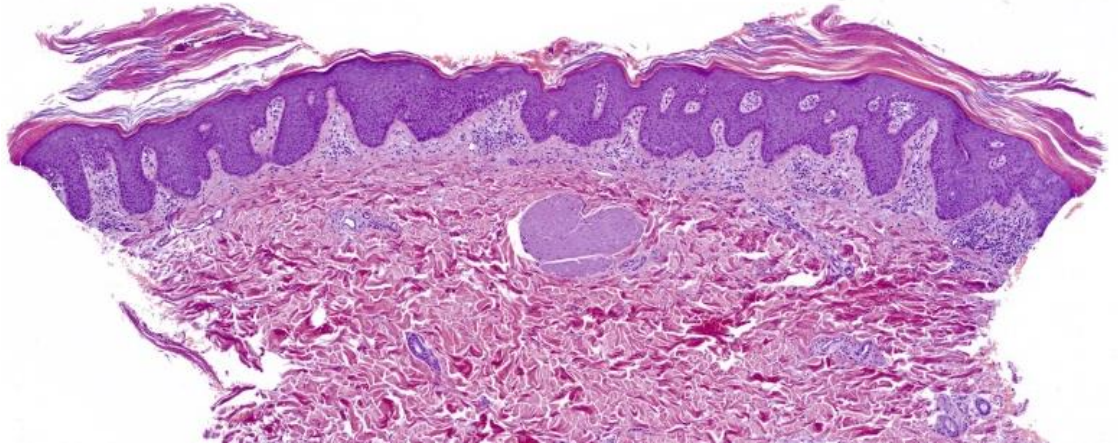
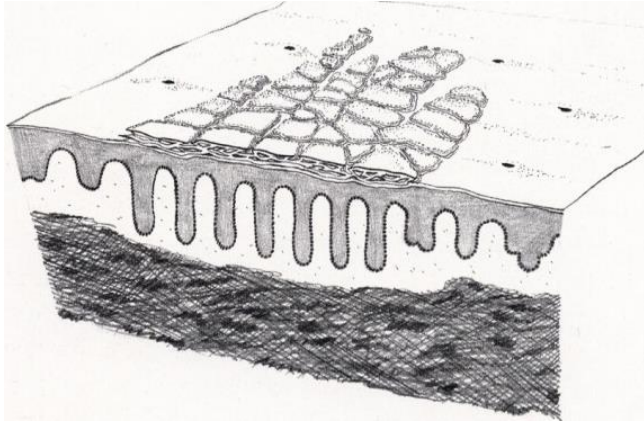


example: psoriasis vulgaris

Psoriasis vulgaris



pattern



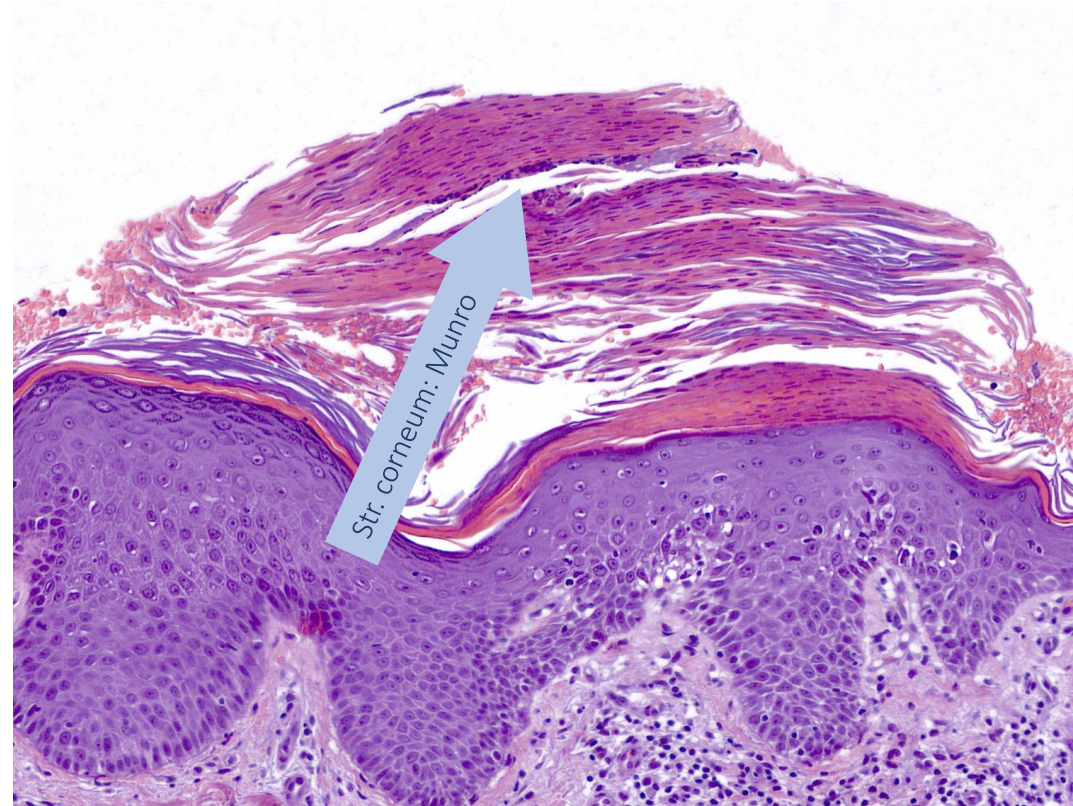
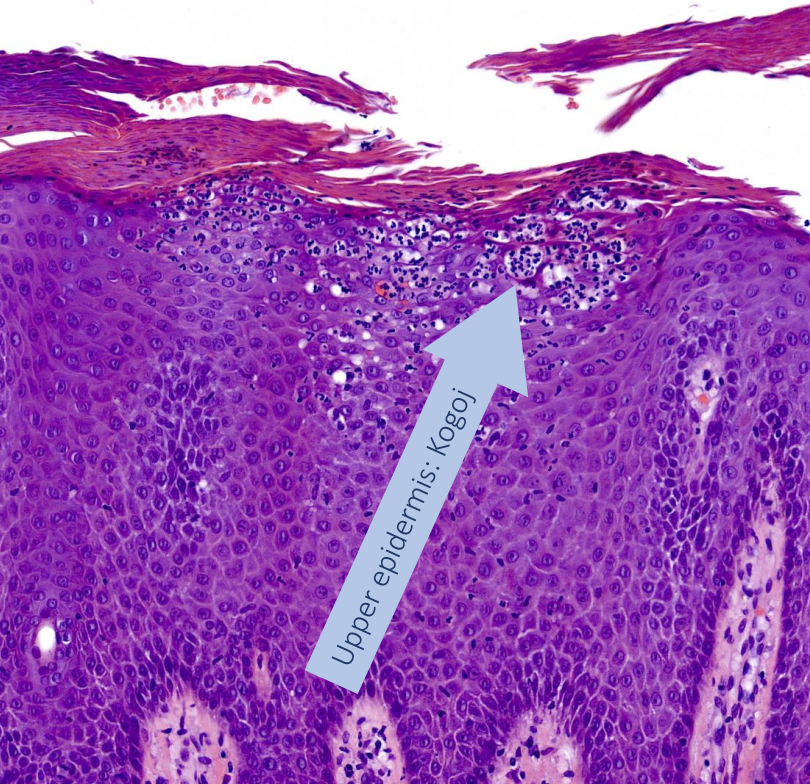
Psoriasiform pattern:

- Regular acanthosis
- Thinned or loss of str. granulosum
- Focal parakeratosis



clue

microabscesses: collections of neutrophils



clue

Not exclusively found in psoriasis!

Exclude a fungal infection:
„sandwich sign“

Caveat!



dermatophytosis





pattern

Patterns are often:
spongiotic or psoriasiform



clue

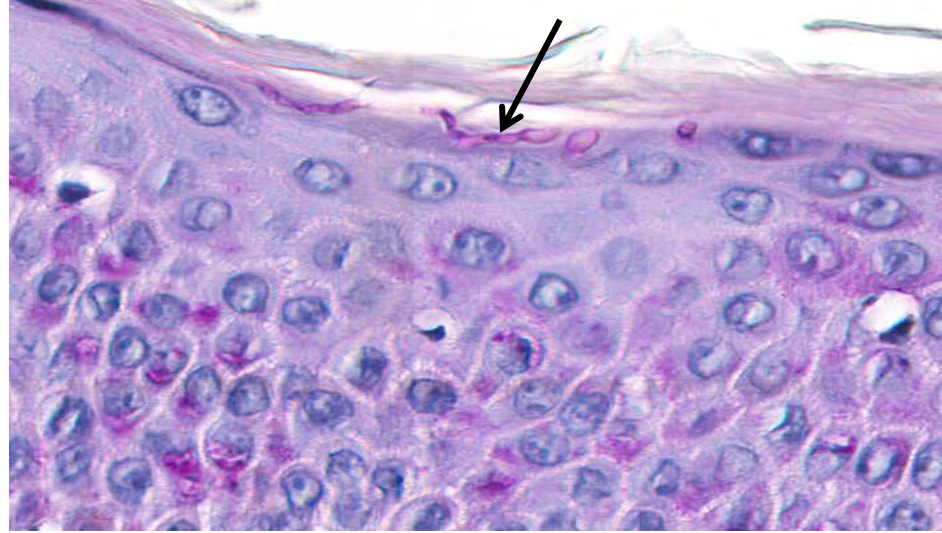
Sandwich-sign:

Two types of keratinization horizontal
and parallel + neutrophils

Tinea corporis

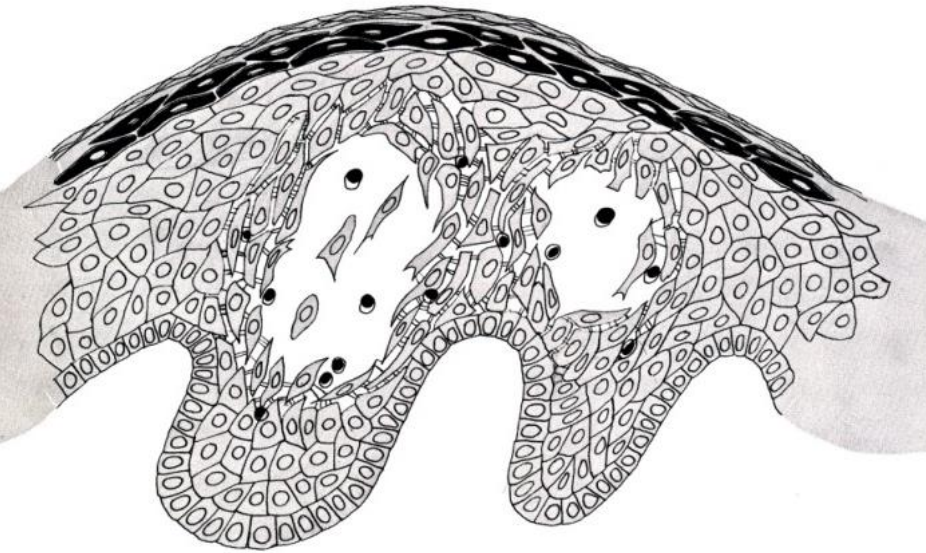
PAS stain:

septated hyphae in the cornified layer

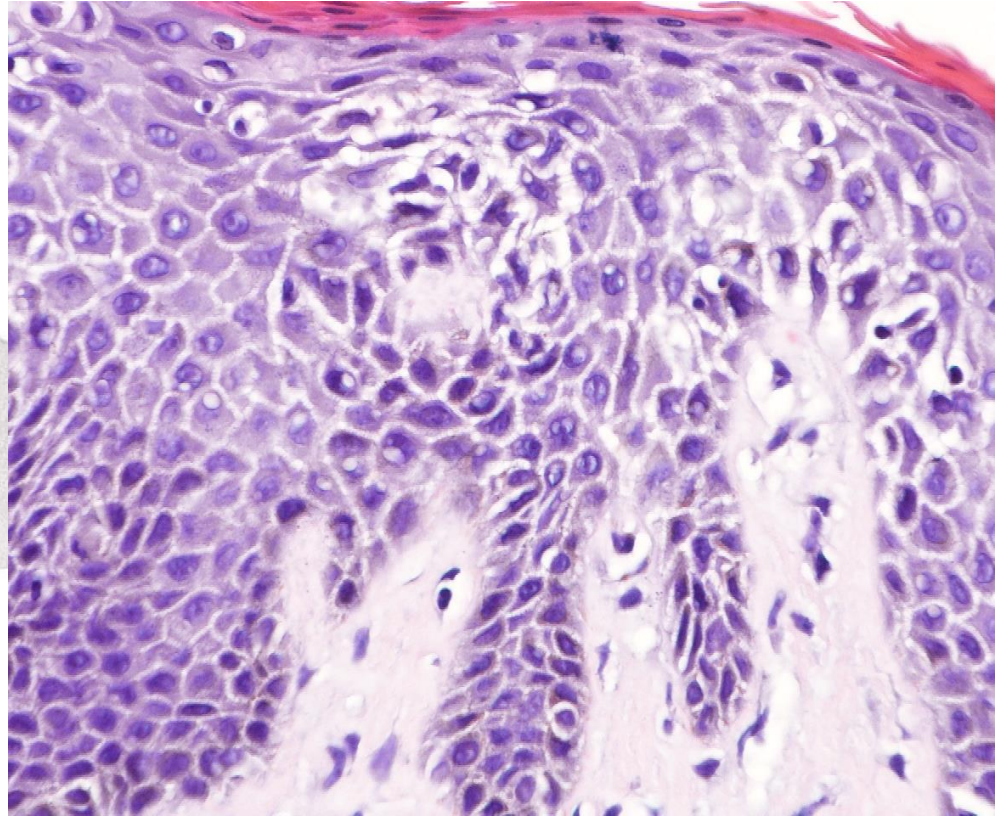


Spongiosis

= intercellular edema with separation of keratinocytes and stretching of intercellular bridges

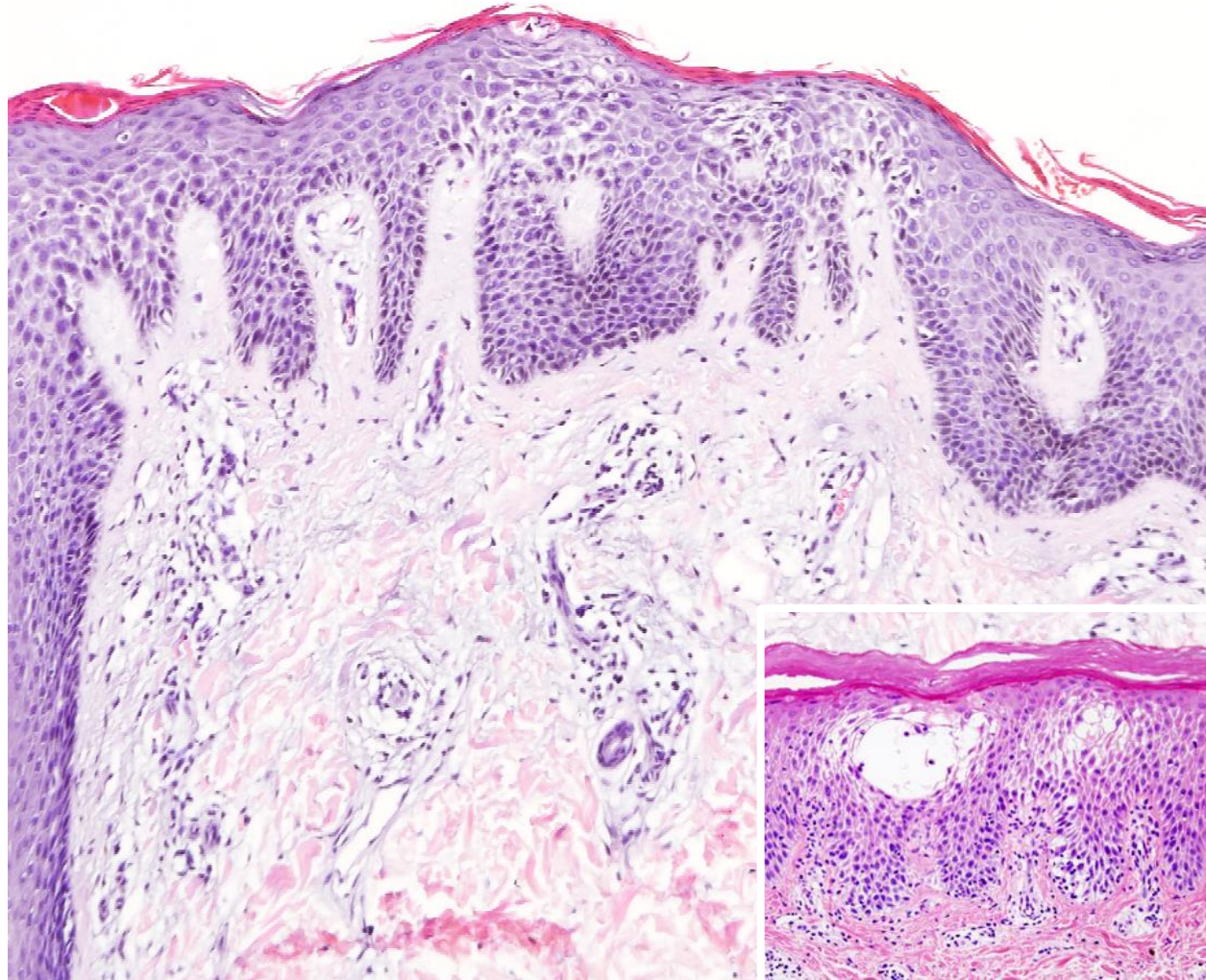


example: eczema



Eczema

- Spongiosis
- Exocytosis of lymphocytes
- Parakeratosis
- Scaly crust with serum inclusions
- Spongiotic vesicles (inset)



Life of lesions



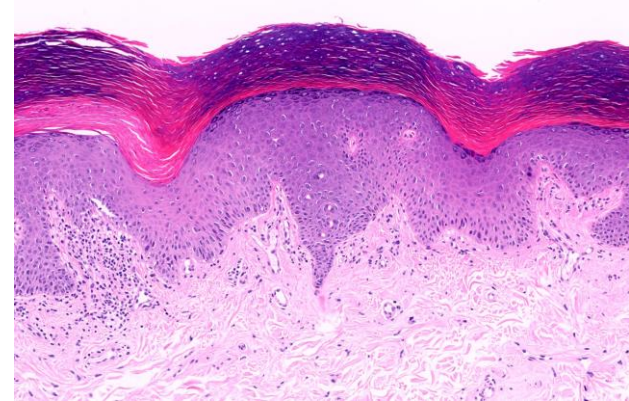
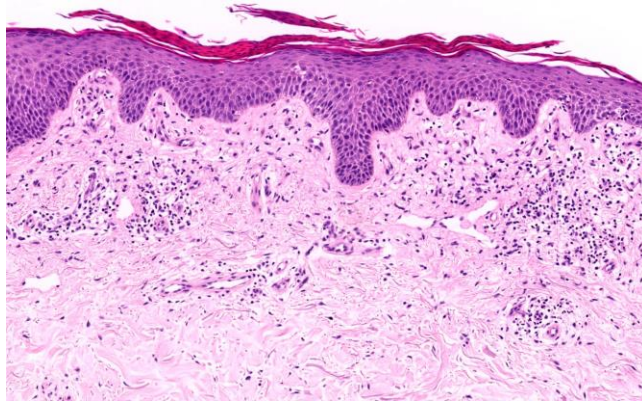
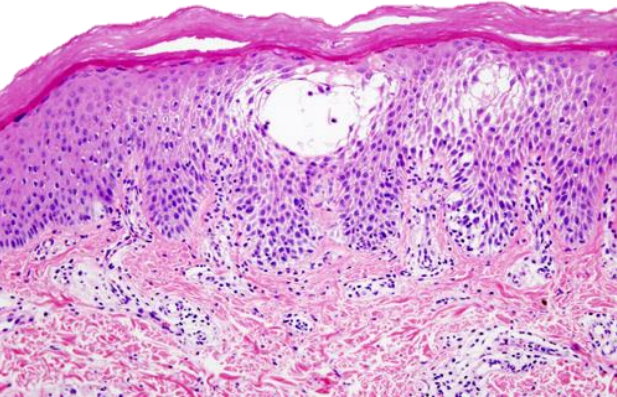
acute



subacute



chronic

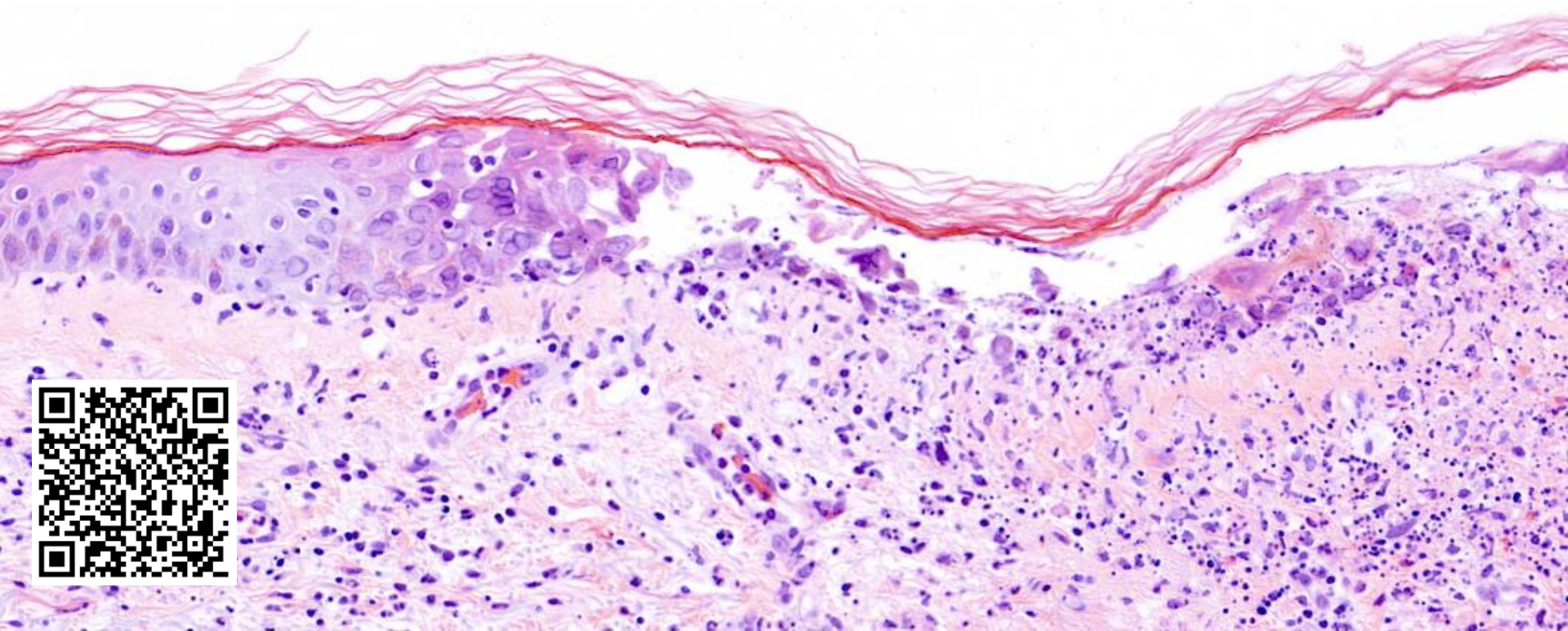


Ballooning degeneration

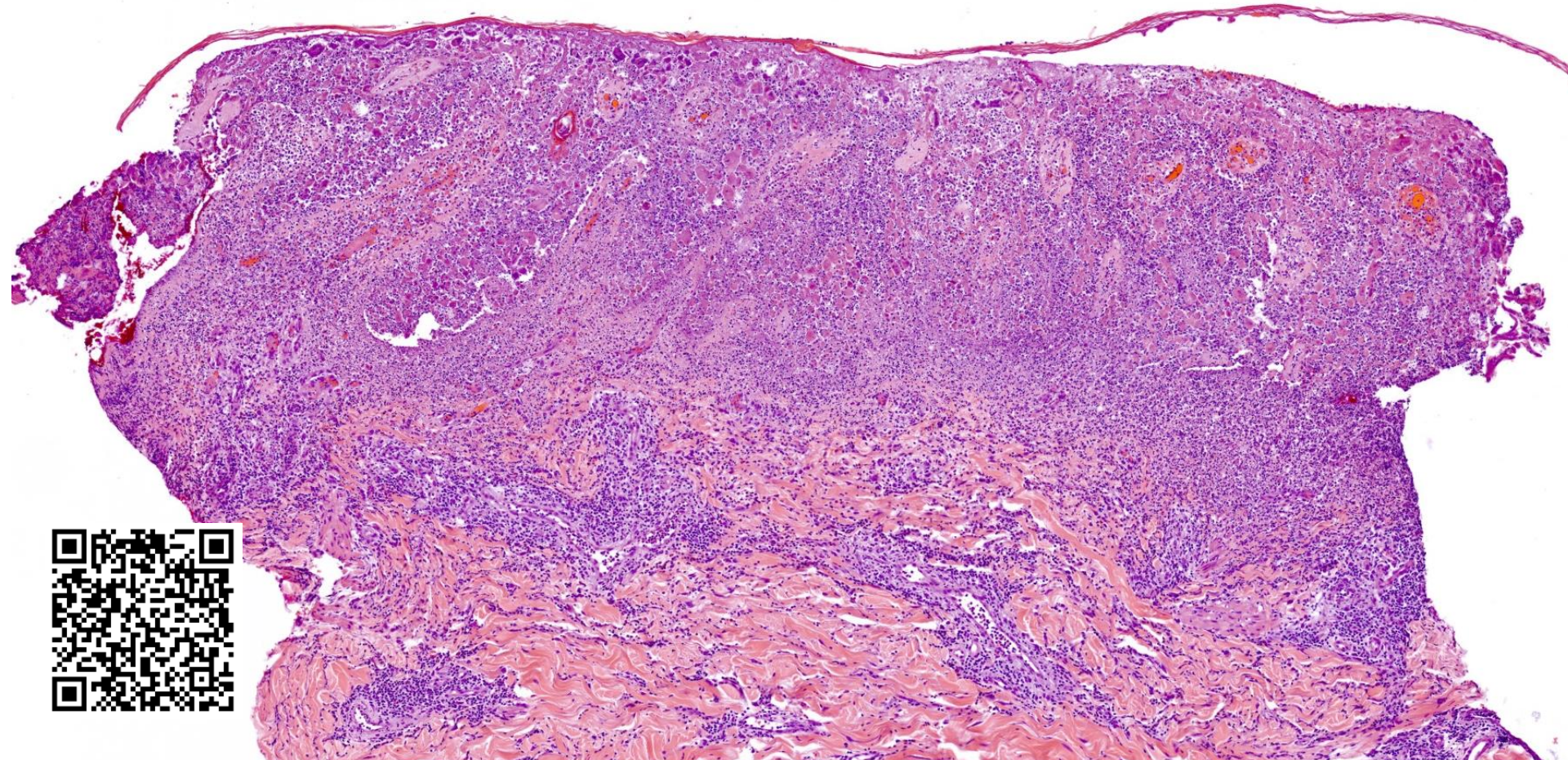
= epidermal changes characterized by cytoplasmic swelling and vacuolization

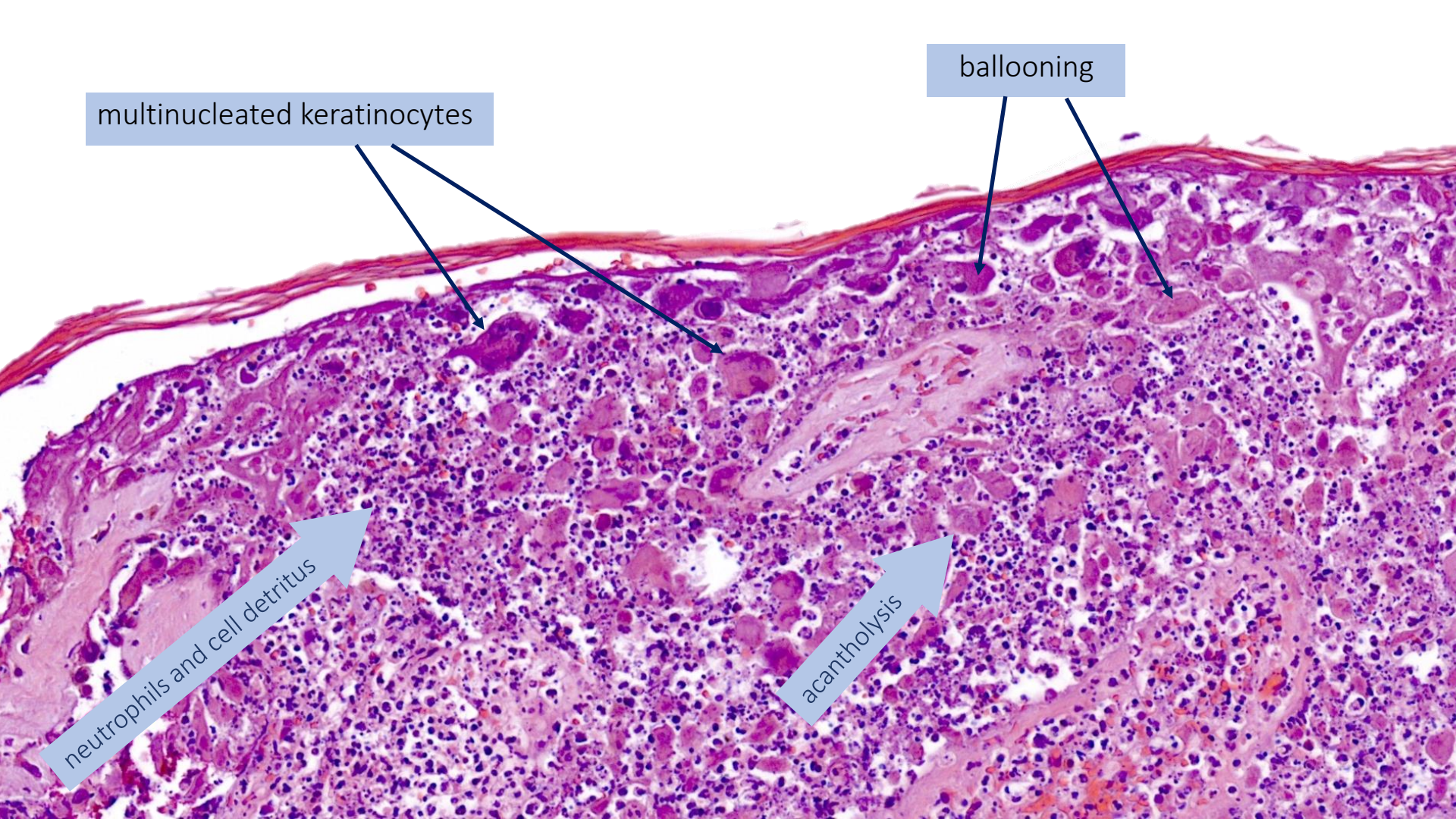
terminology

example: herpes simplex



Herpes virus infection





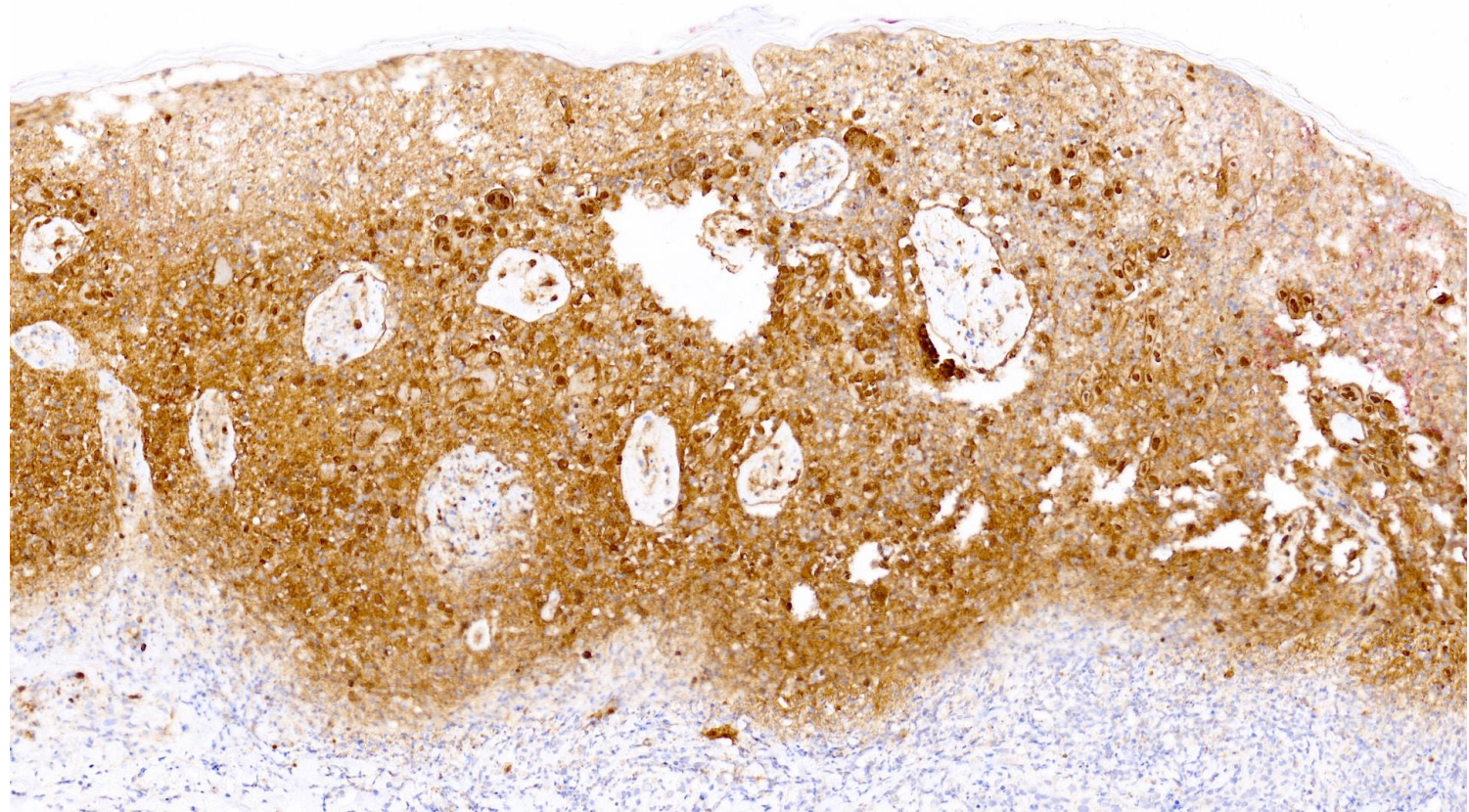
multinucleated keratinocytes

ballooning

neutrophils and cell detritus

acantholysis

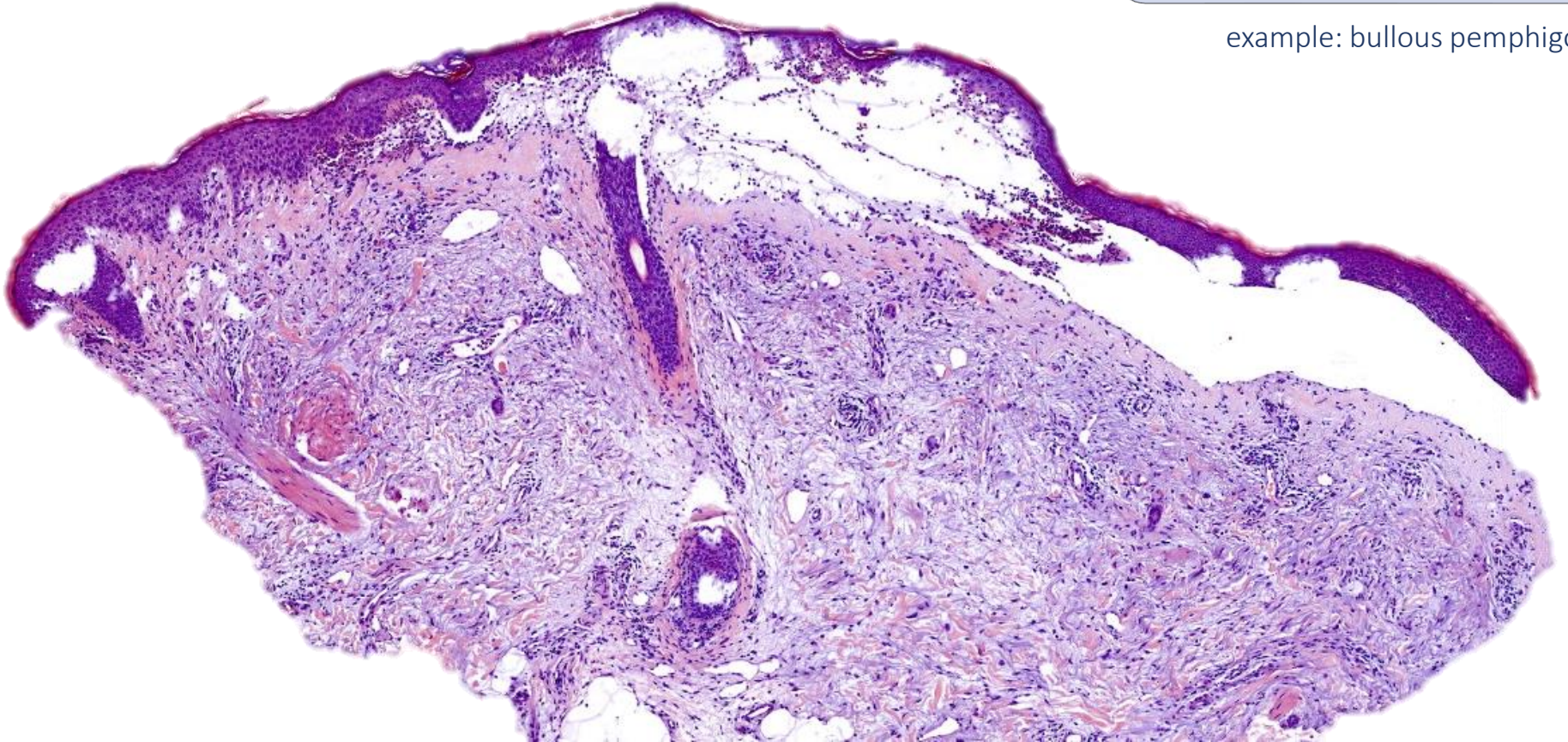
Immunohistochemical detection of HSV I



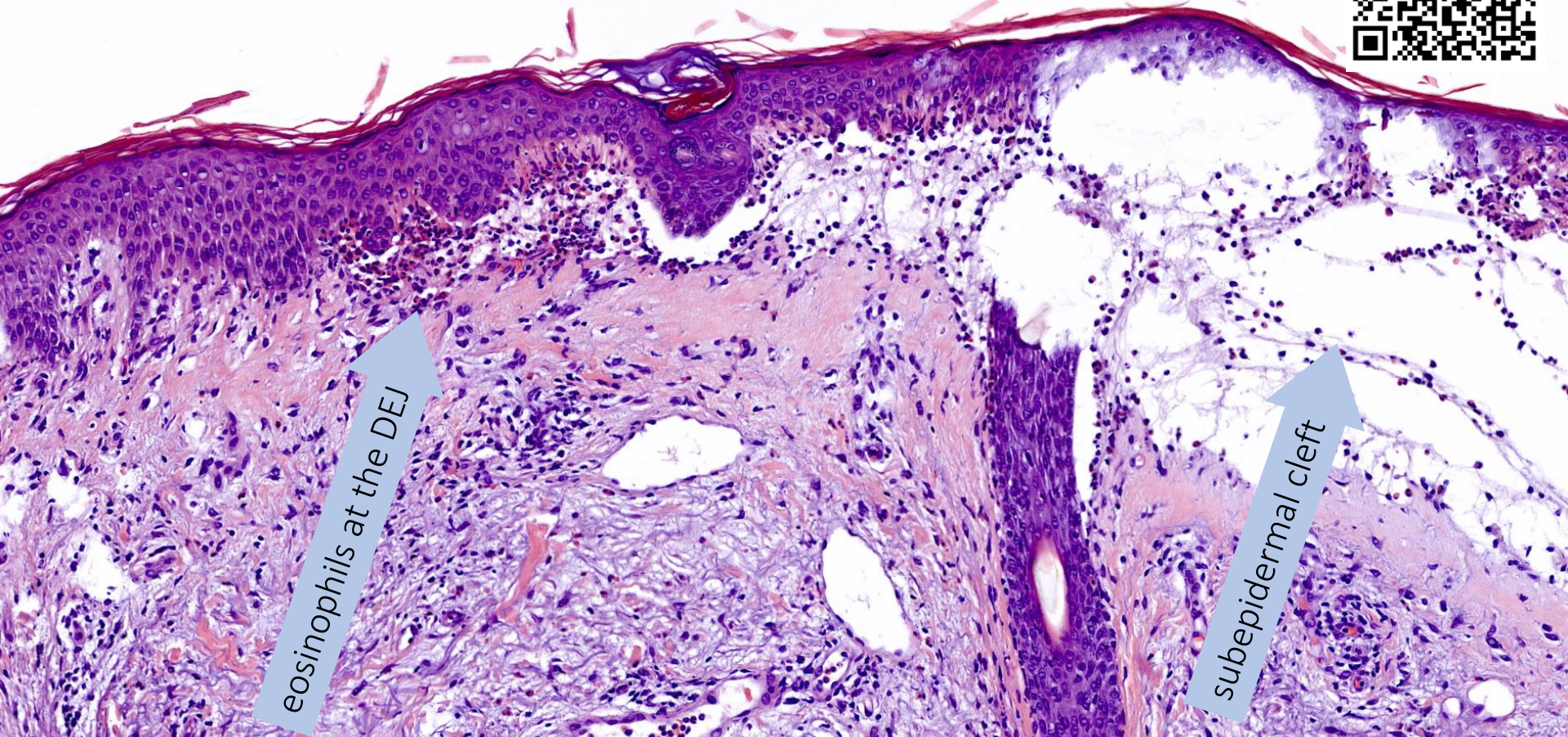
Subepidermal clefting

terminology

example: bullous pemphigoid



Bullous pemphigoid



eosinophils at the DEJ

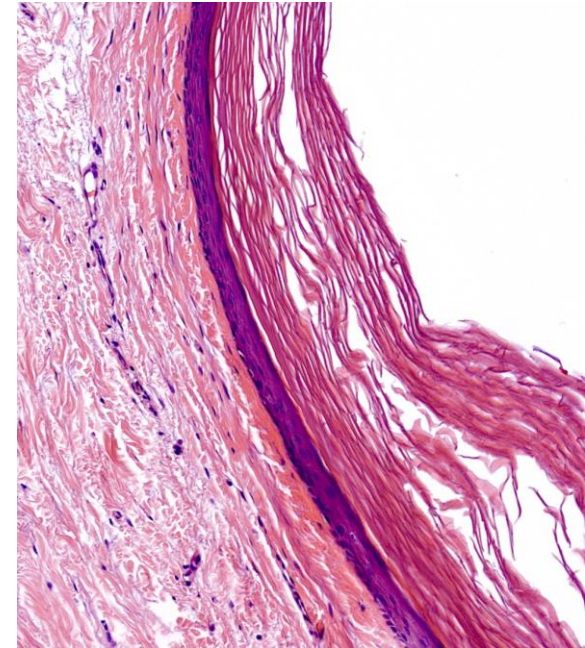
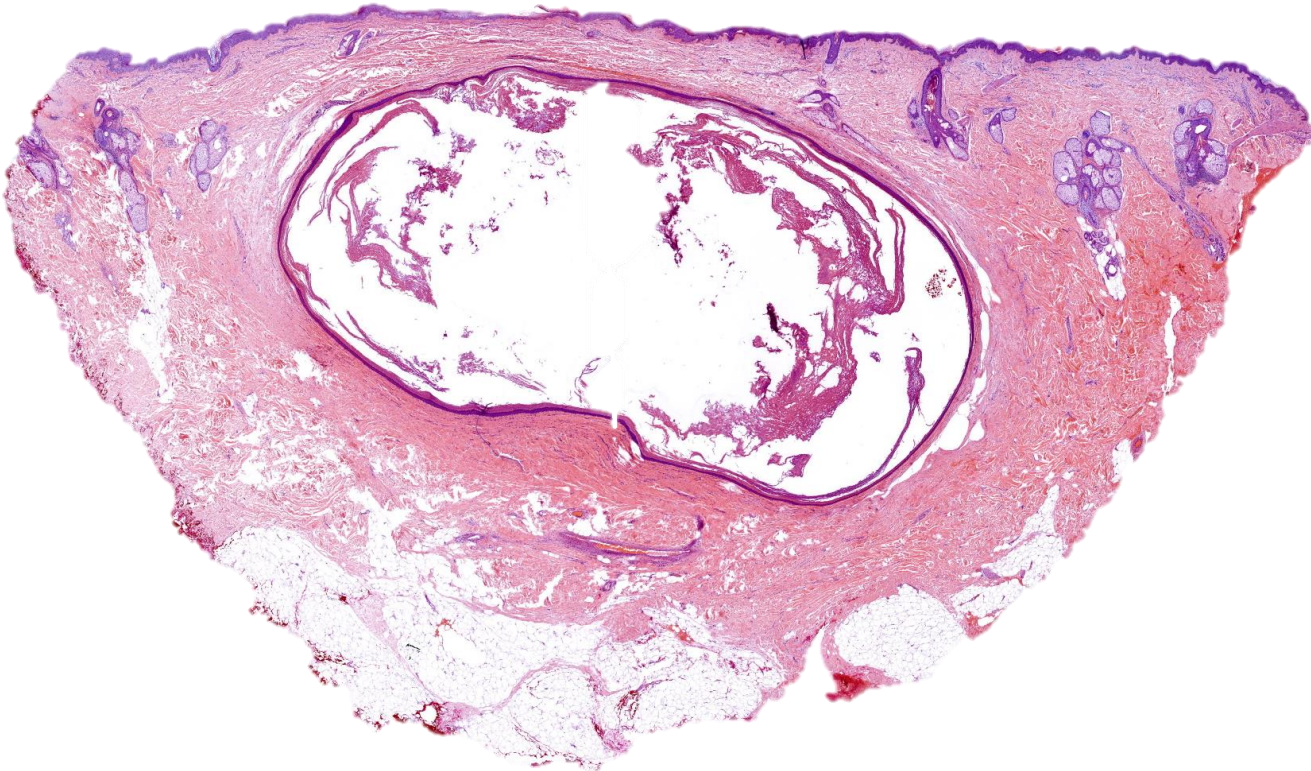
subepidermal cleft

Cyst

= Cavity with epithelial wall lining



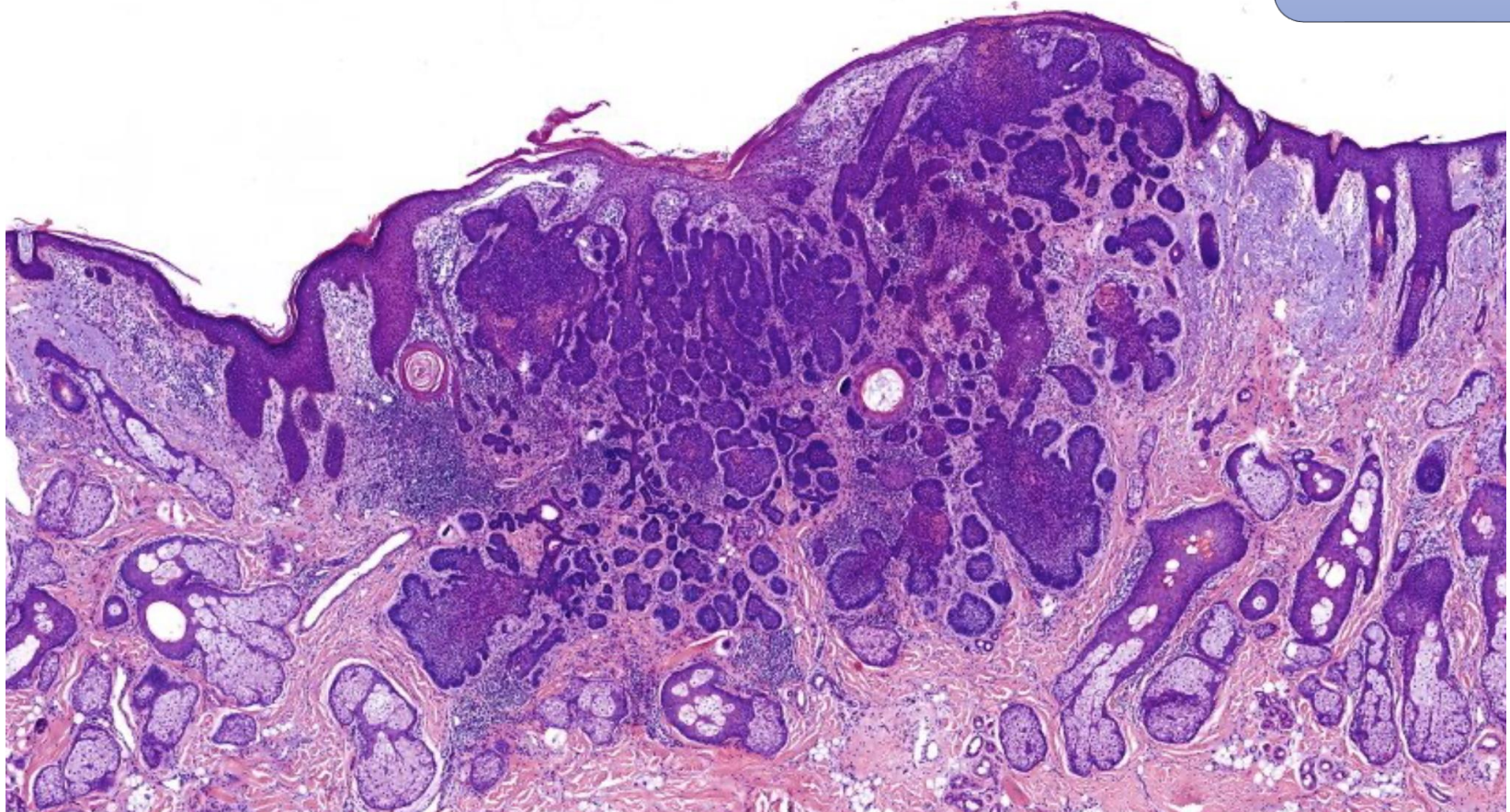
terminology

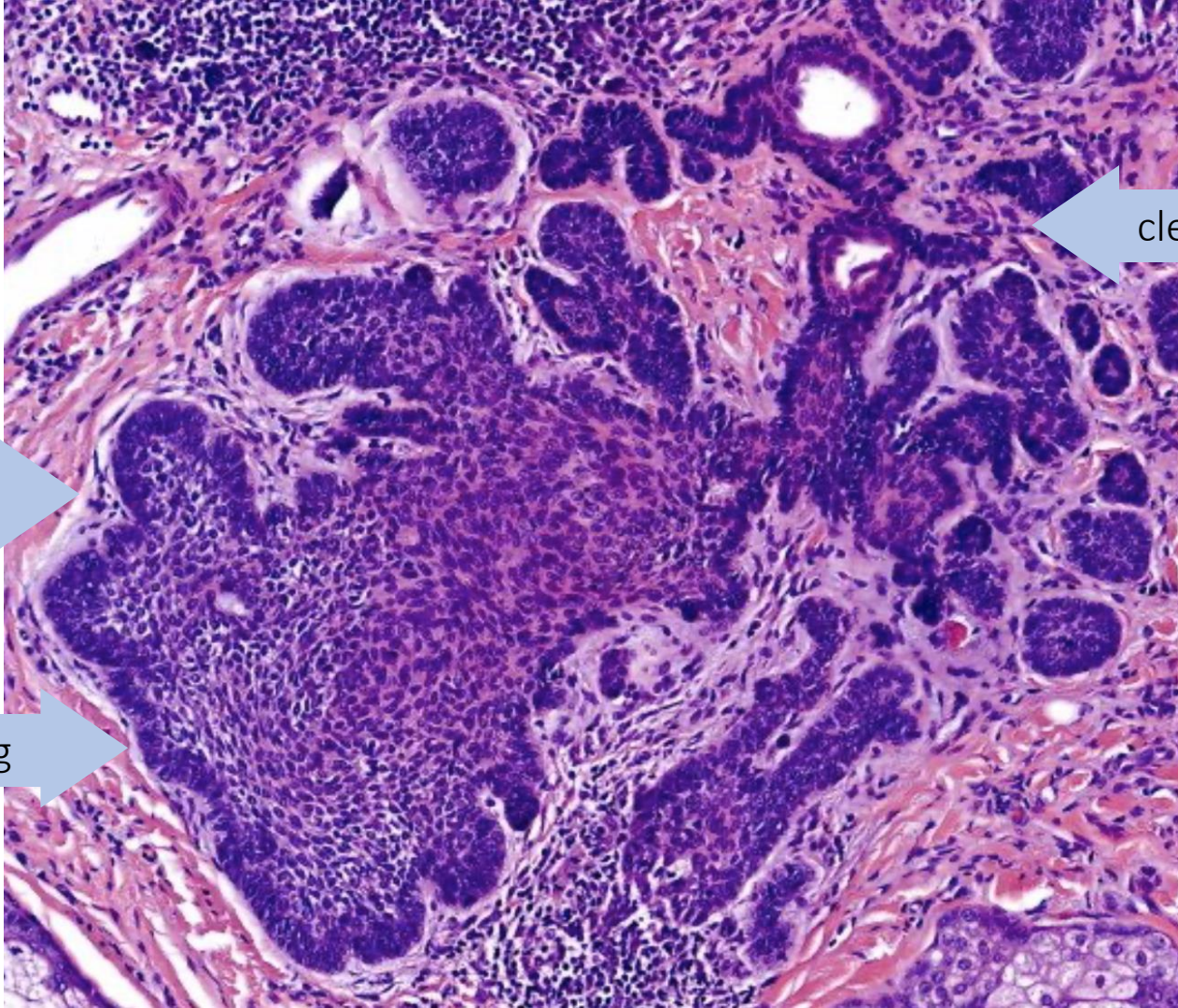


example: epidermal cysts

Basal cell carcinoma - nodular

tumours



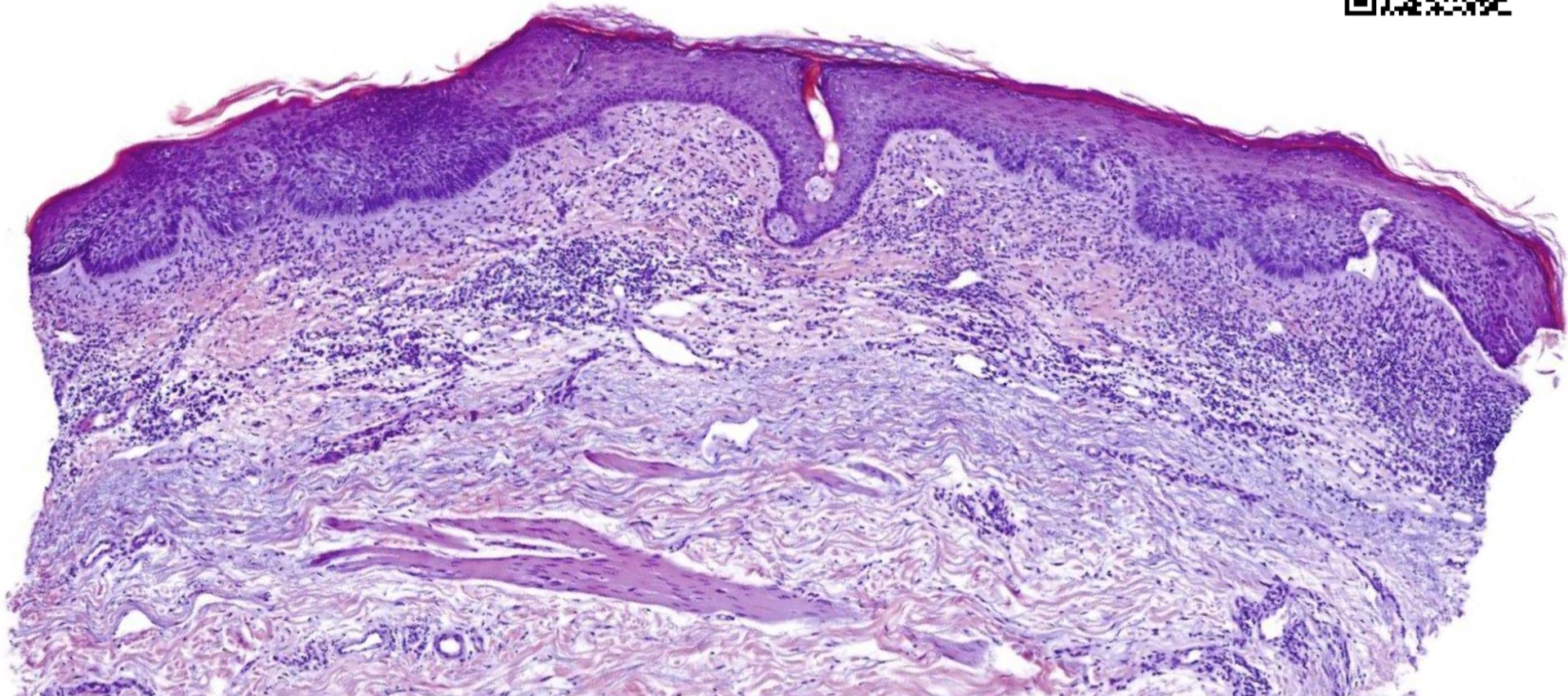


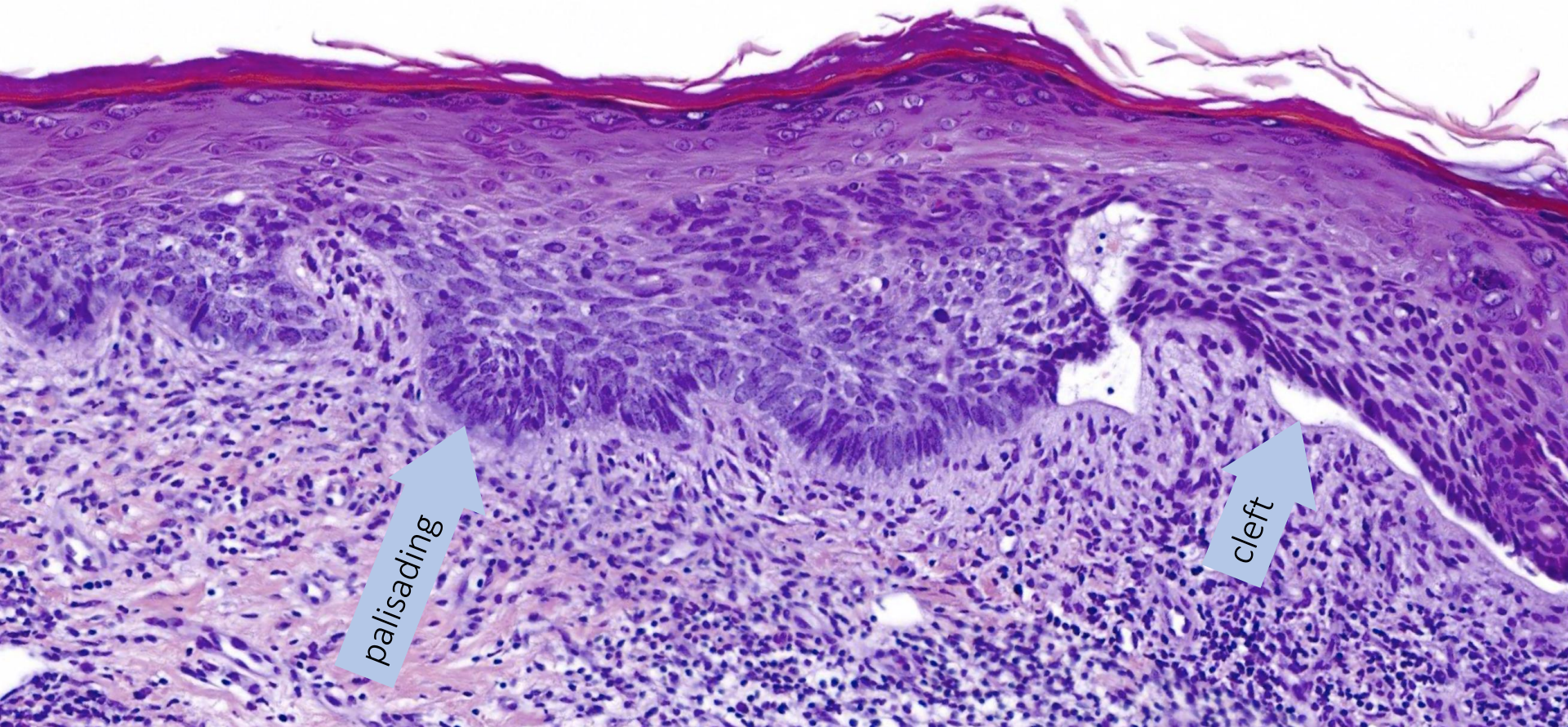
mucin

palisading

cleft

Basal cell carcinoma - superficial





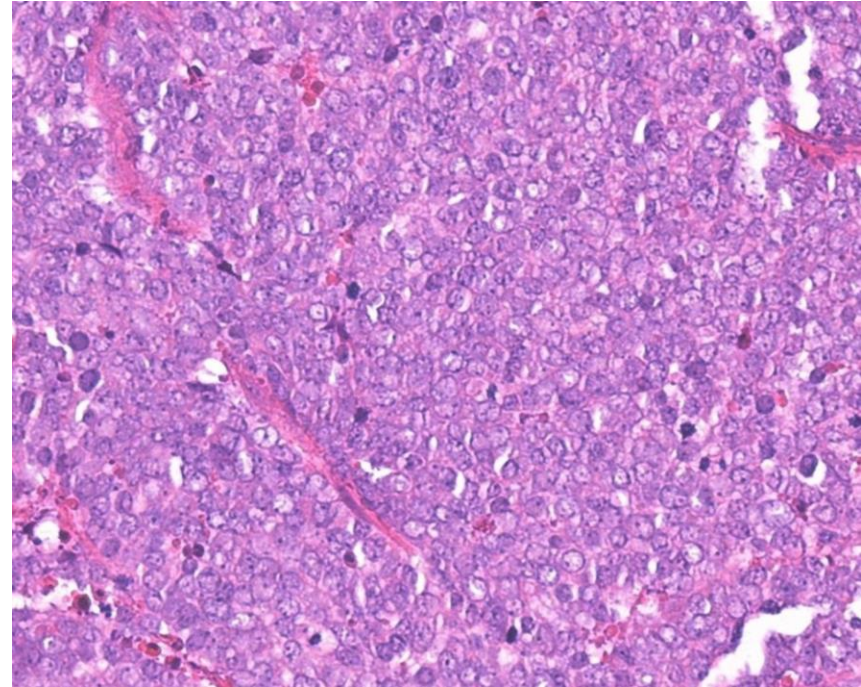
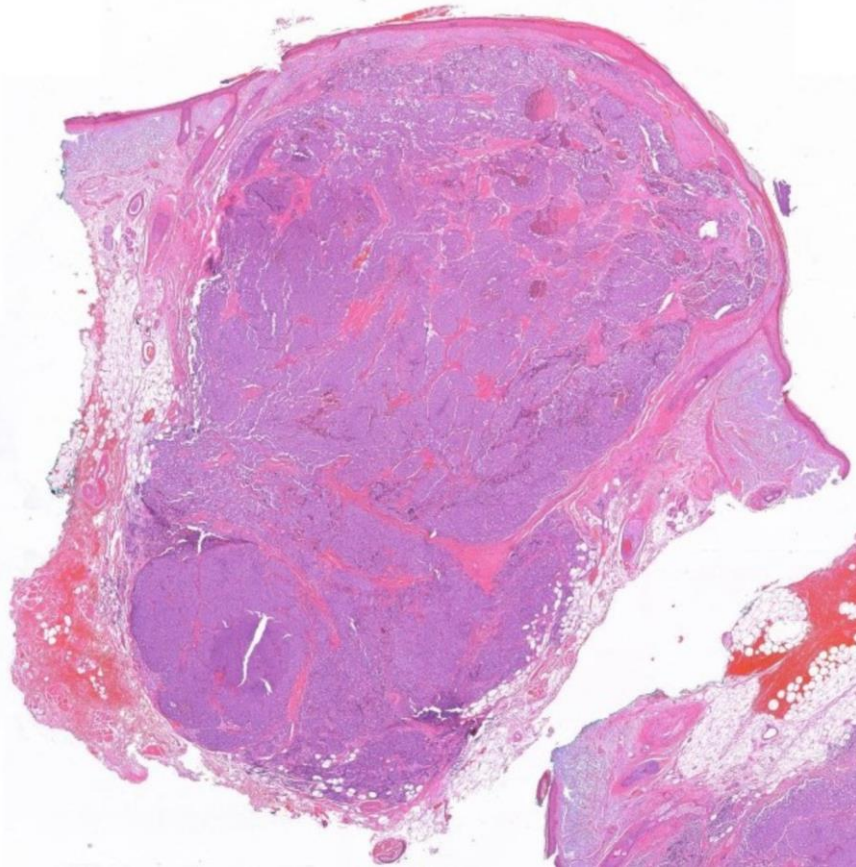
palisading

cleft

Merkel cell carcinoma



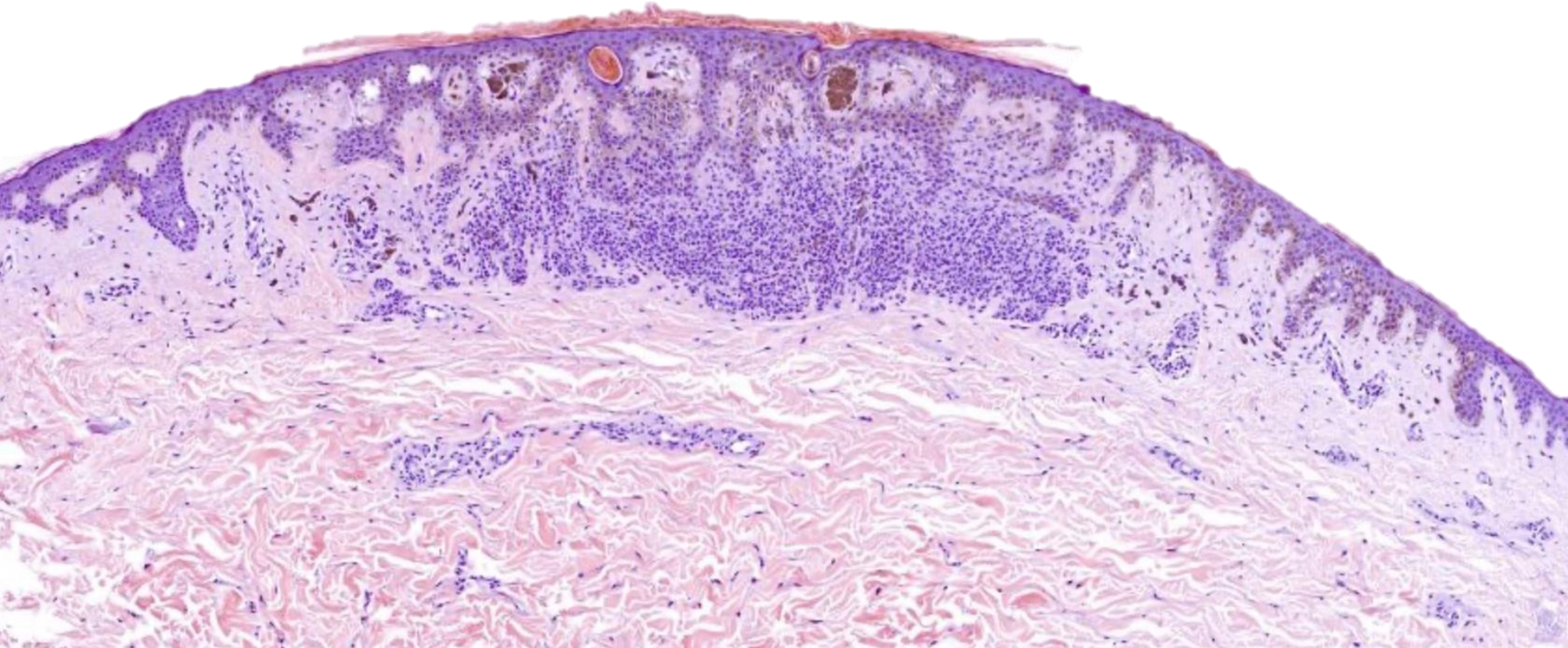
tumours



Melanocytic nevus



tumours



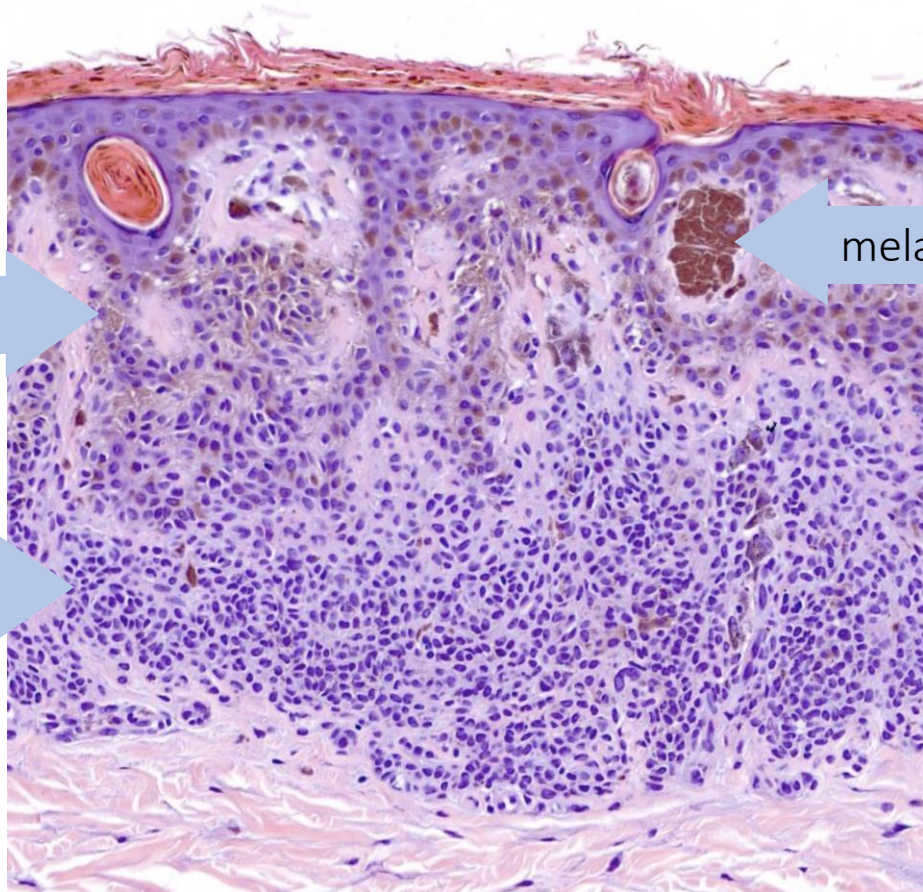
Melanocytic nevus

tumours

junctional melanocytes

dermal melanocytes

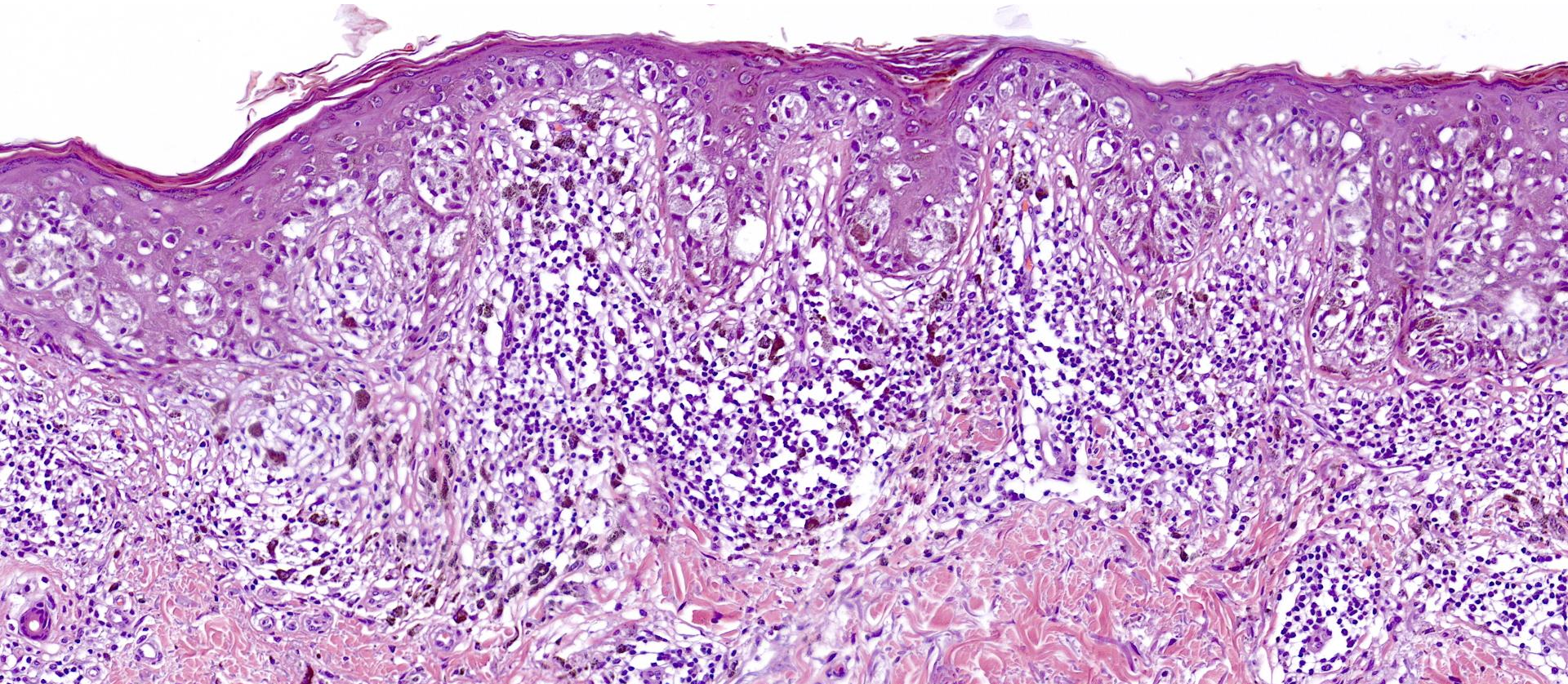
melanophages



Melanoma

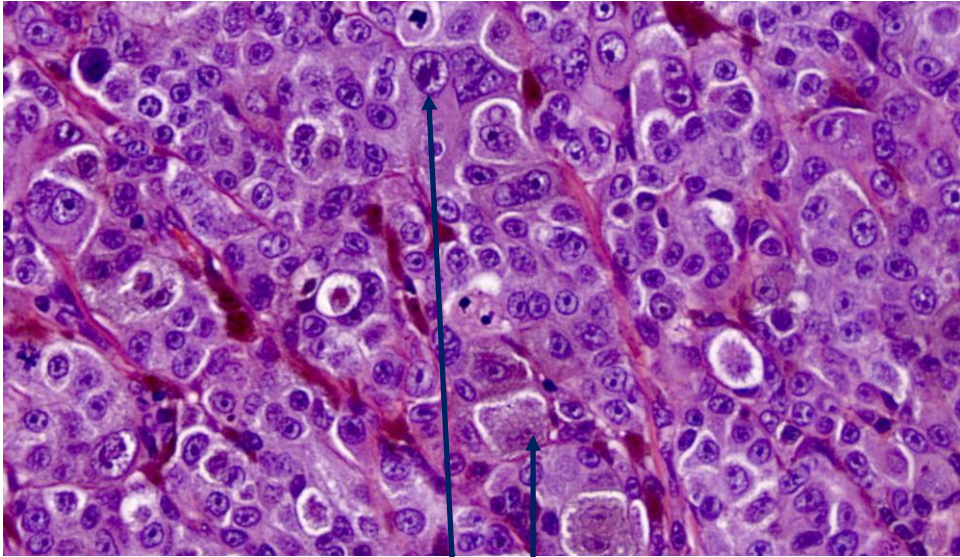


tumours

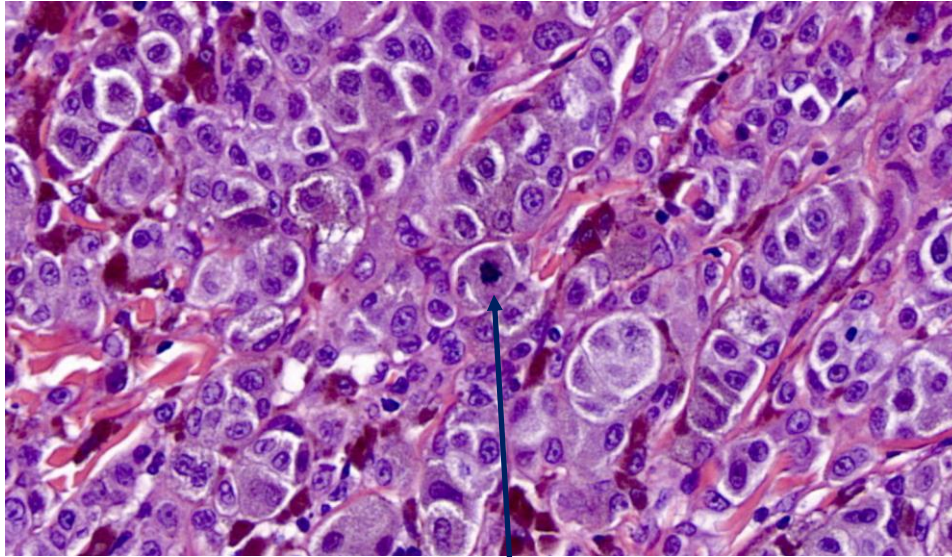


Melanoma

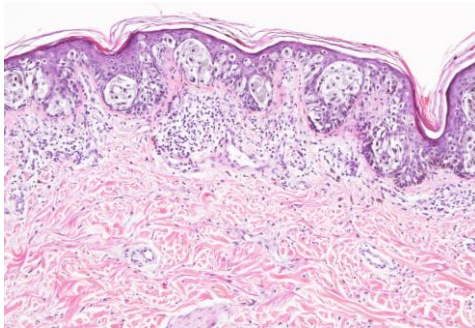
tumours



pleomorphic nuclei of melanocytes

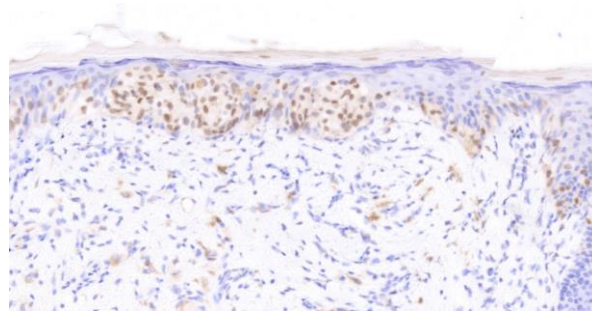
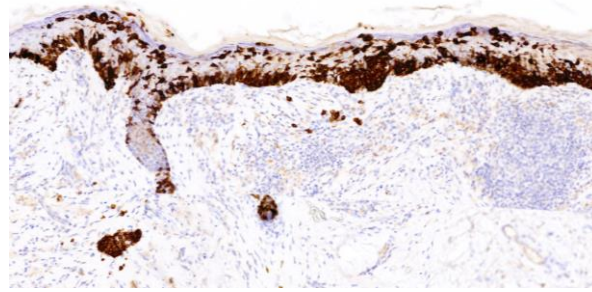


mitosis



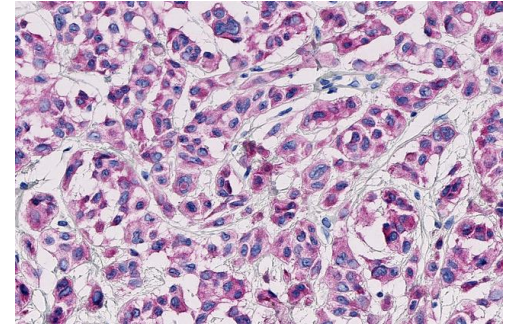
superficial spreading melanoma/
low-CSD (cumulative sun damage)
melanoma

→ tumour thickness 1.5 mm



MelanA: confirms the cell type
(melanocytes)
PRAME*: likelihood of melanoma

*preferentially expressed antigen in melanoma

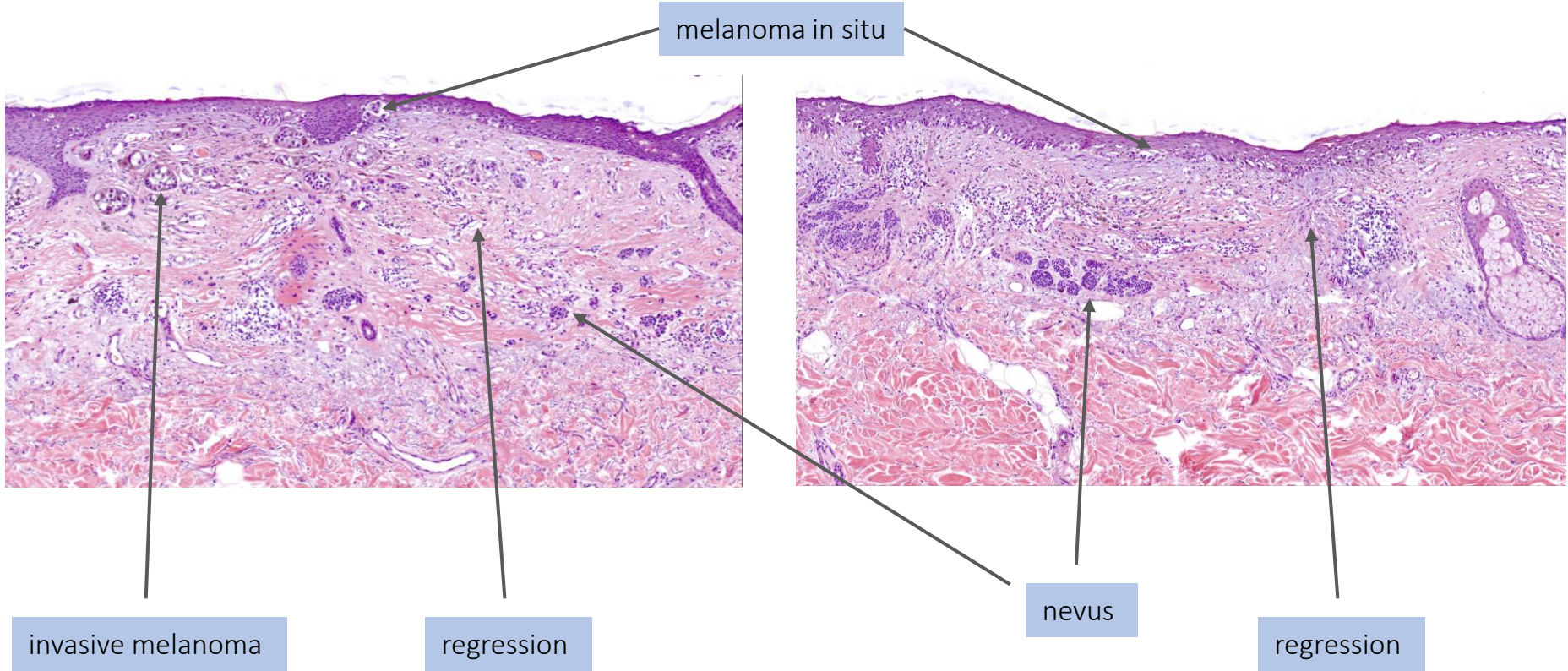


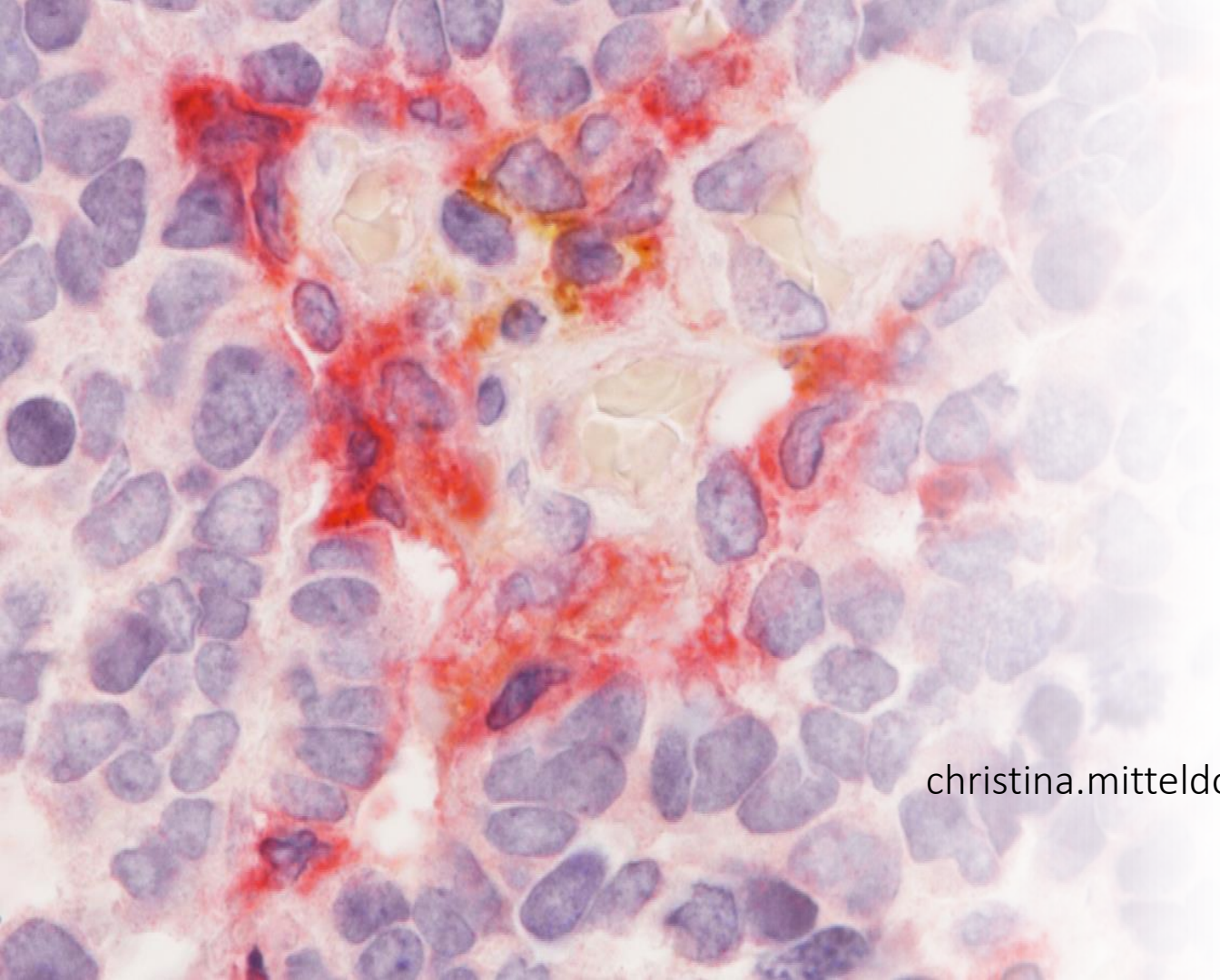
B-RAF V600E immunohistochem.
B-RAF mutation: e.g. NGS (next
generation sequencing)

→ specific therapy

Regression? Melanoma and / or associated nevus?

tumours





Thank you!

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