

Melanonychia: When Pathology is Important

Curtis T. Thompson, M.D.

CTA Pathology

and

Volunteer Adjunct Associate Professor of Dermatology

University of Miami Miller School of Medicine

and

Clinical (Adjunct) Professor of Dermatology and Pathology

Oregon Health and Science University

Thanks to
Dr. Eckart Haneke!

New melanonychia

Which age at onset?

Babies and children: benign

Adolescents: usually benign

Adults < 30 years: probably benign

Adults > 30 years: suspicious

Adults > 40: probably malignant

Adults > 50: usually malignant

Thanks to
Dr. Eckart Haneke!

Melanonychia

When did it appear?

All recently developed melanonychias in adult fair-skinned individuals over 30 years are suspicious.

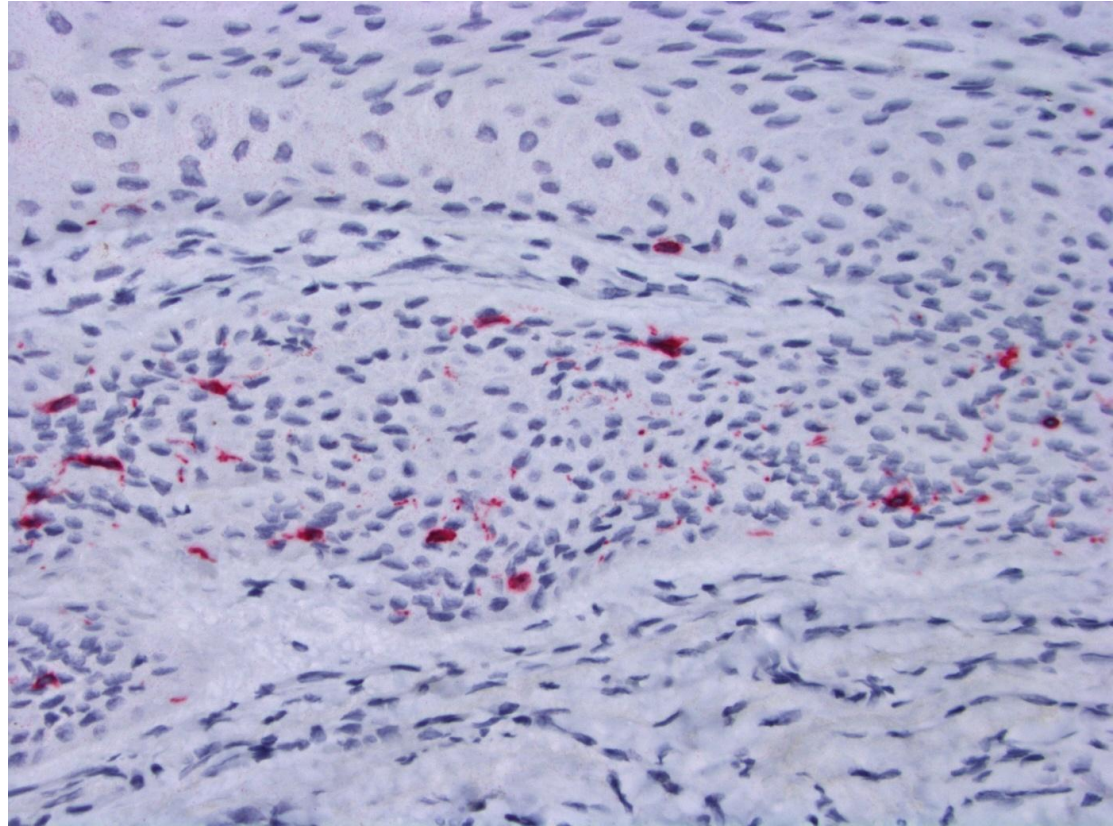
Exception: Functional melanonychia

Density of melanocytes

- Depends upon skin type



Density of melanocytes varies with skin type



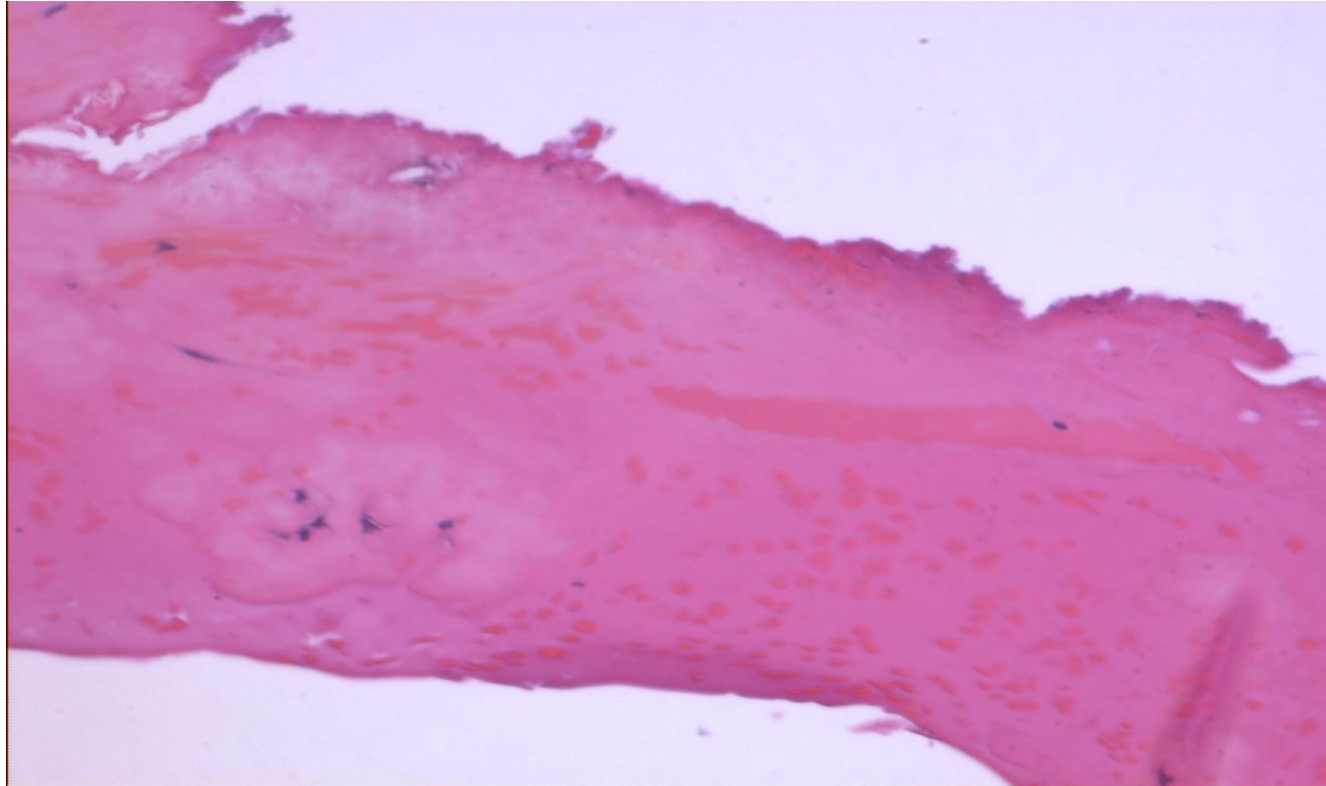
What is the source of the pigment?



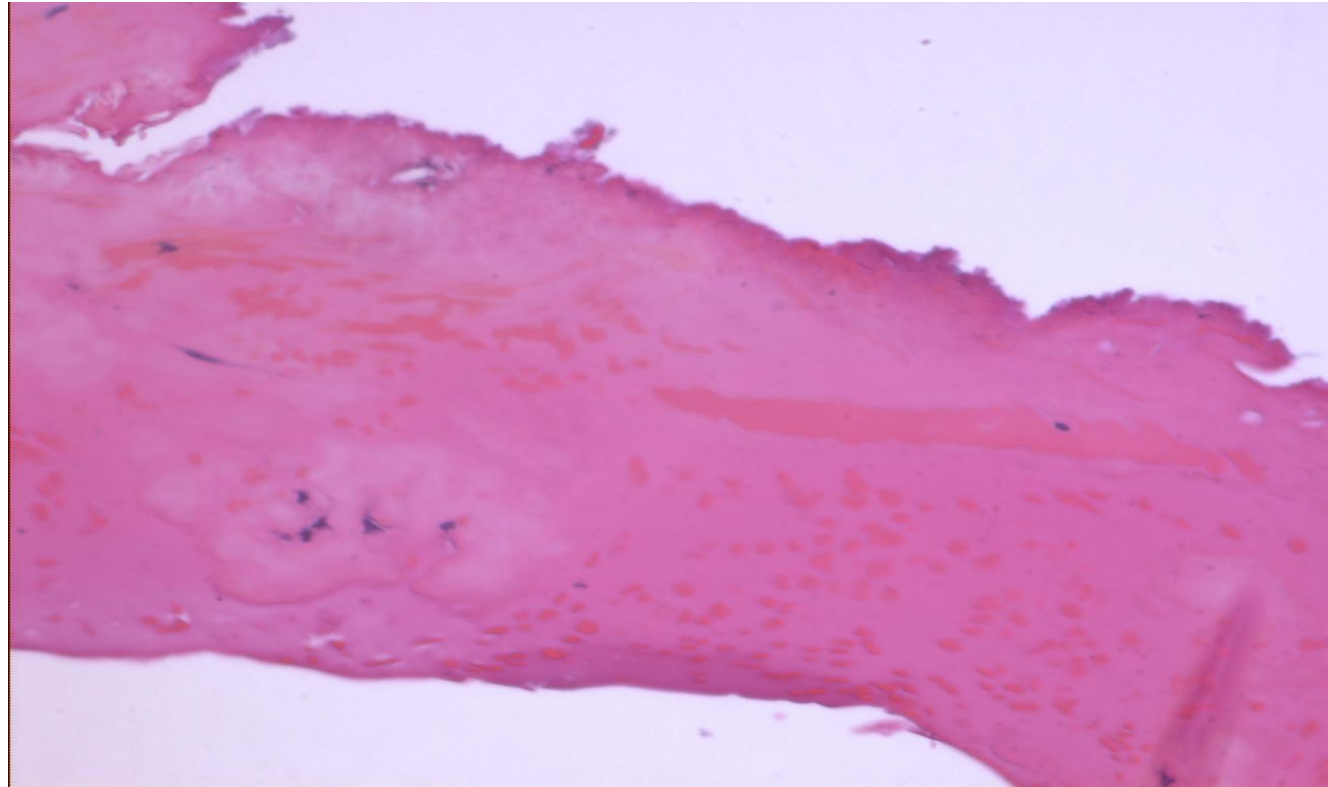
What is the source of the pigment?

- Melanocytic neoplasm
 - Benign
 - Malignant
- Melanocyte ‘activation’

Blood in nail plate

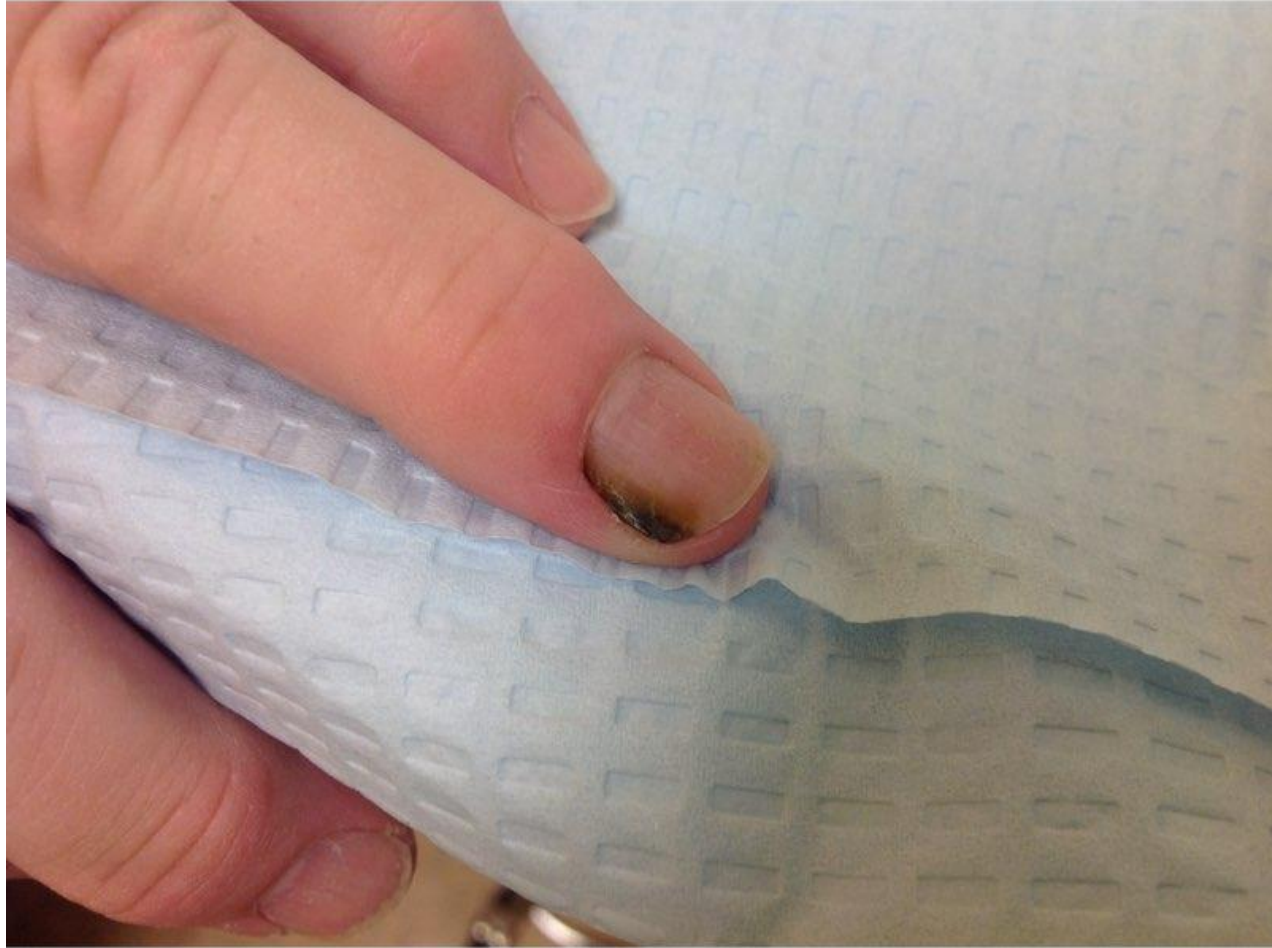


Perl's iron stain does not work.

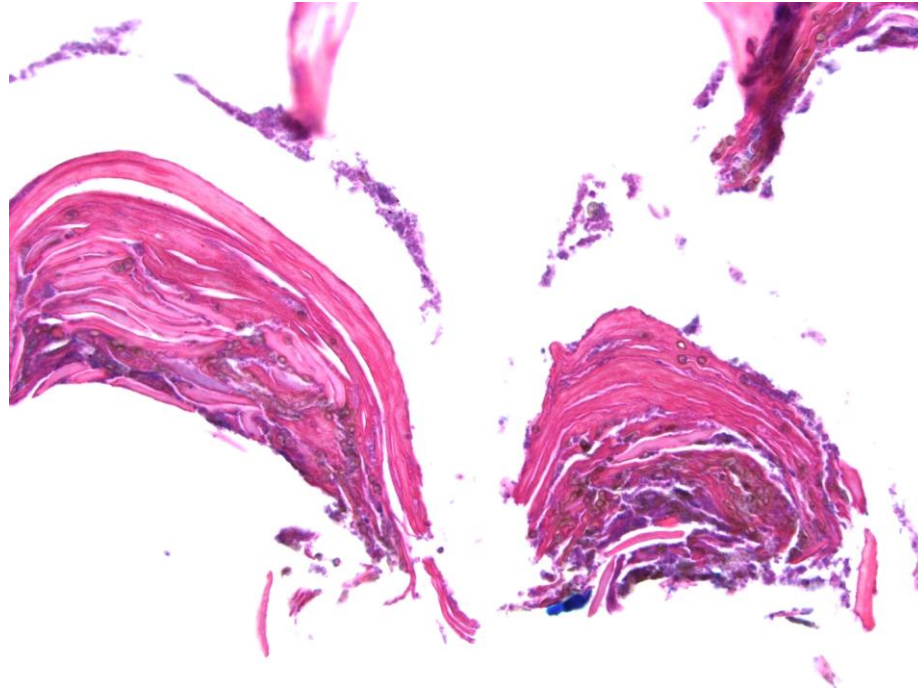


What is the source of the pigment?

- Non-melanocytic
 - Trauma—blood



Pigmented fungus



What is the source of the pigment?

- Non-melanocytic
 - Trauma—blood
 - Infection
 - Pigmented fungus

What is the source of the pigment?



Pseudomonas aeruginosa



What is the source of the pigment?

- Non-melanocytic
 - Trauma—blood
 - Infection
 - Pigmented fungus
 - Bacteria (*Pseudomonas*)



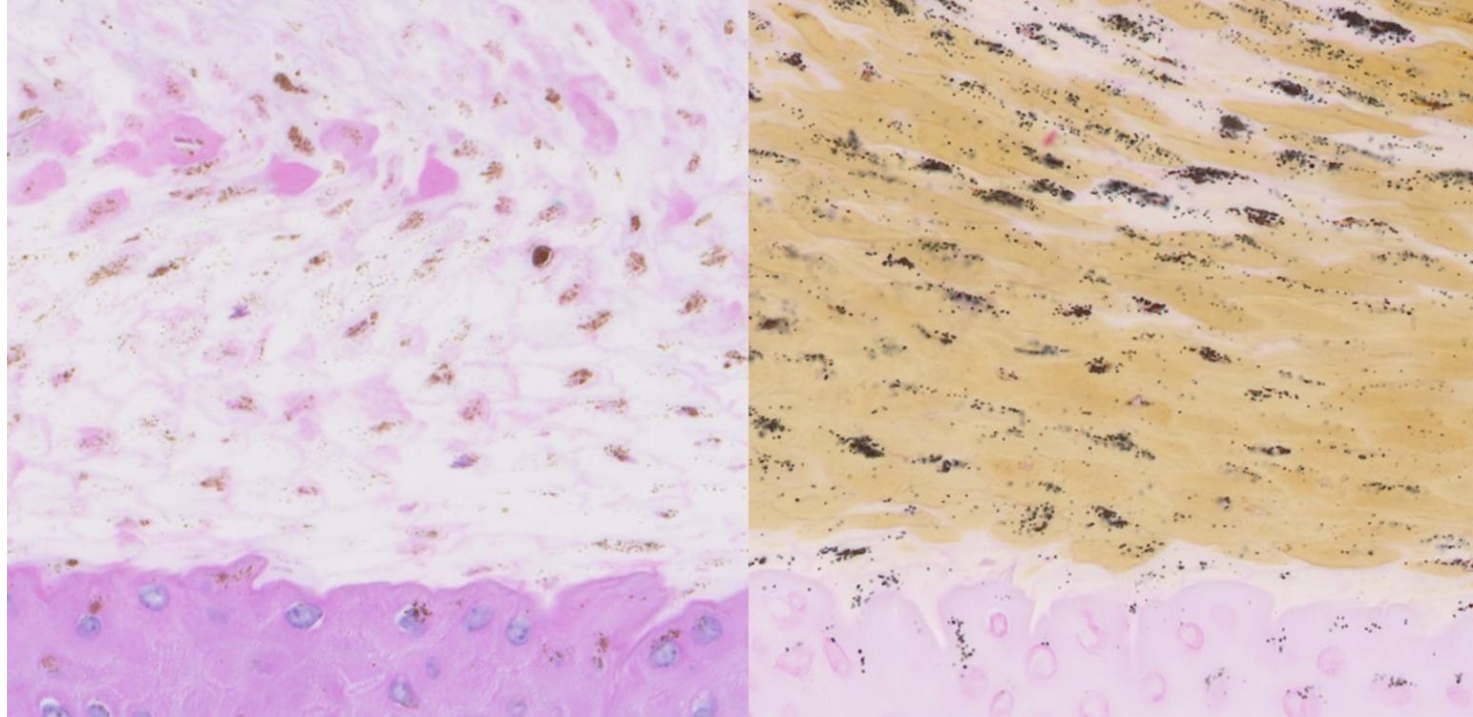
DermNetNZ.org

Drug deposition

- Multiple nails
- Iron and melanin may be present



Nail plate pigment—melanin or other



Fontana-Masson—must dilute



Nail Pigmentation from Drugs

- Deposition
- Change in growth rate of nail
- Hemorrhage (splinter or subungual)
 - Anticoagulants and antiplatelet agents
 - Taxanes
 - Tetracyclines
 - EGFR inhibitors (imatinib, etc)

What is the source of the pigment?

- Non-melanocytic
 - Trauma—blood
 - Infection
 - Pigmented fungus
 - Bacteria (Pseudomonas)
 - Drug

What is the source of the pigment?

- Melanocytic neoplasm
 - Benign
 - Malignant
- Melanocyte ‘activation’

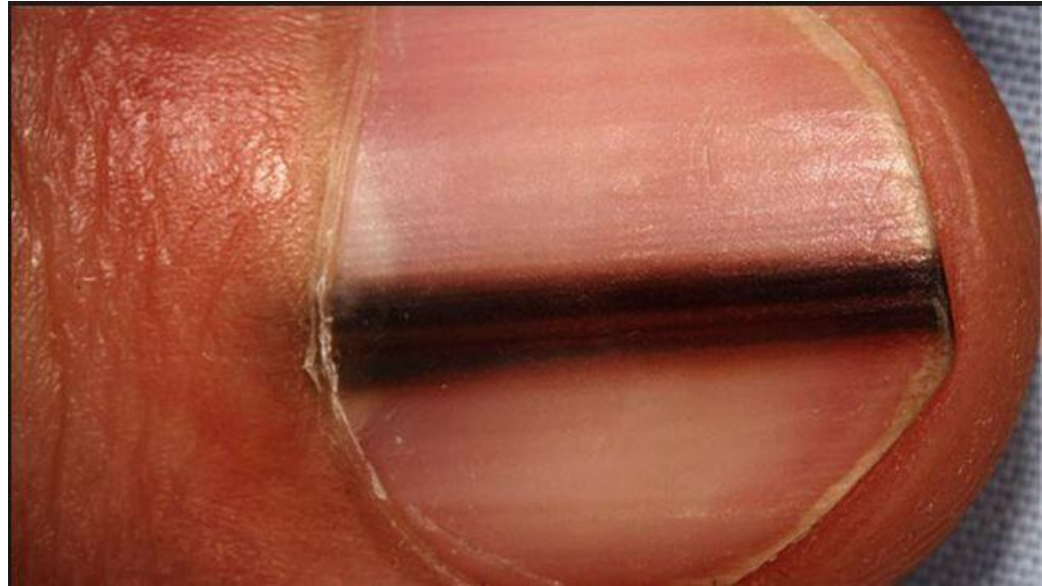
What is the source of the pigment?

- Melanocytic neoplasm
 - Benign
 - Malignant
- Melanocyte 'activation'

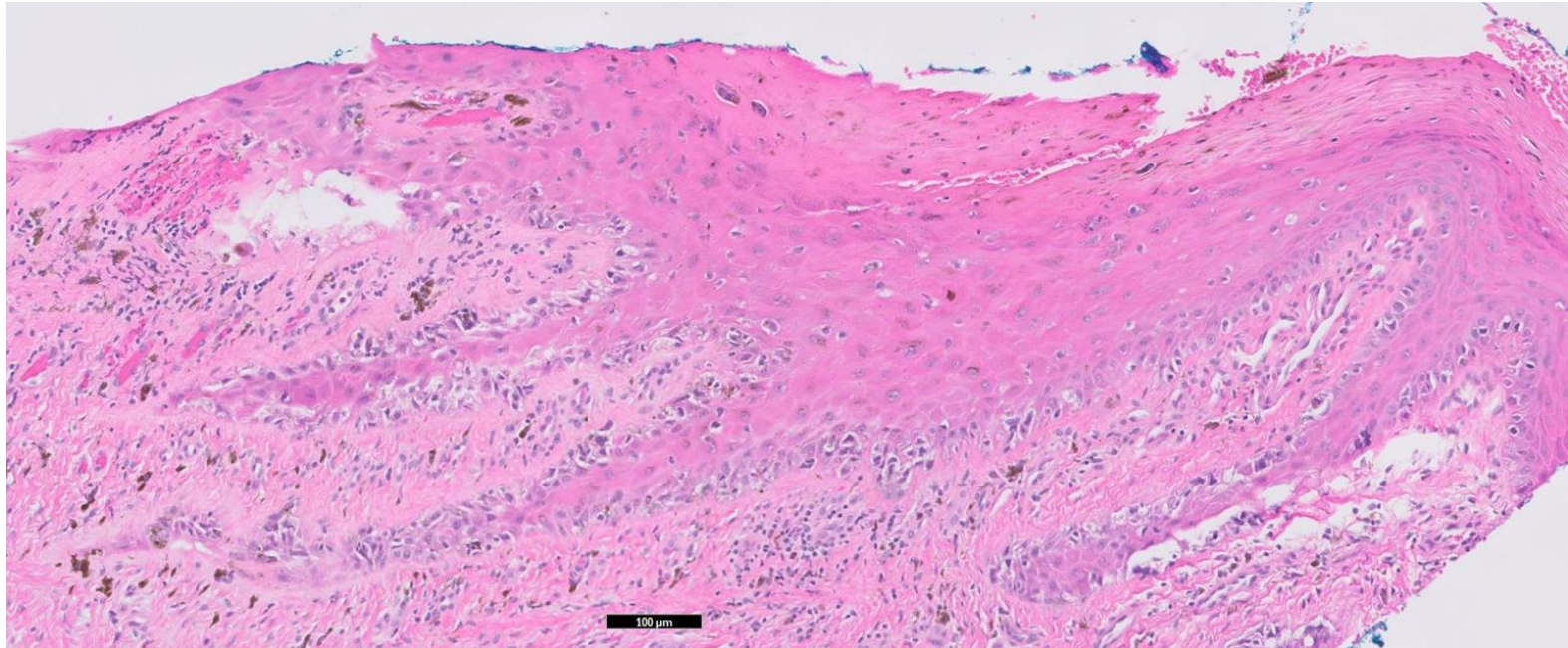
Longitudinal Melanonychia

60 y.o. left thumbnail

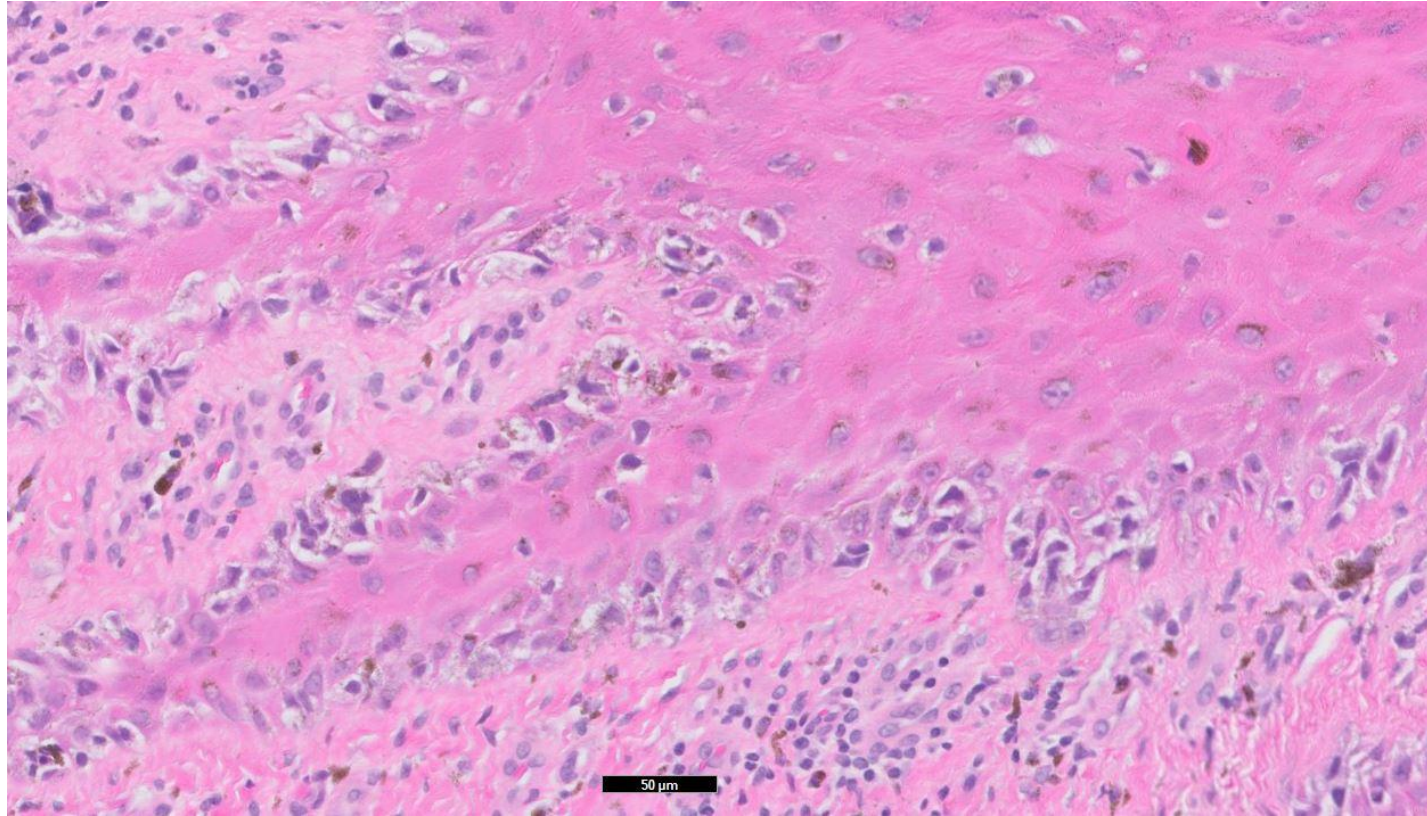
- New pigment
- Older age
- Skin type



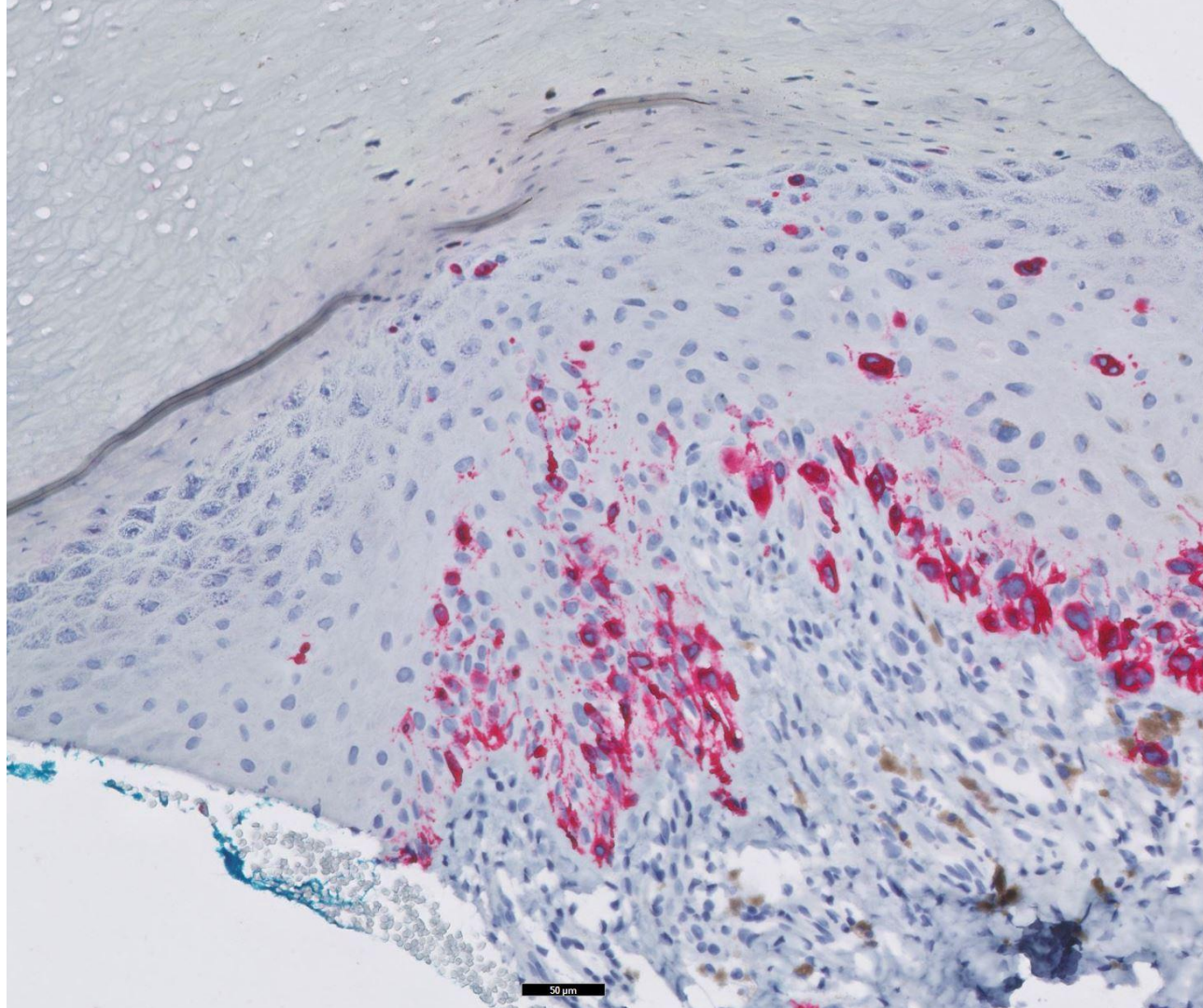
60 y/o left thumbnail



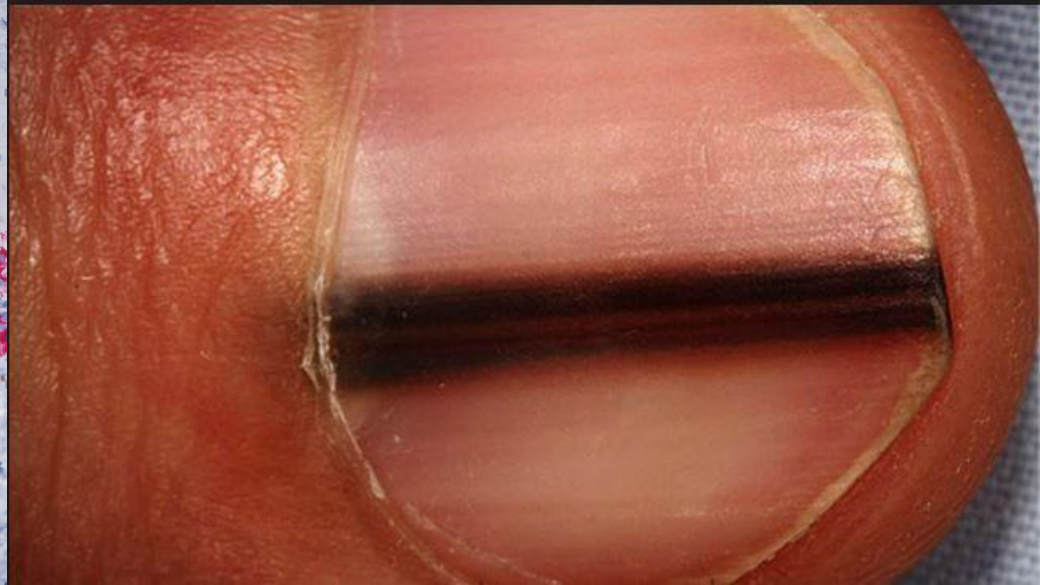
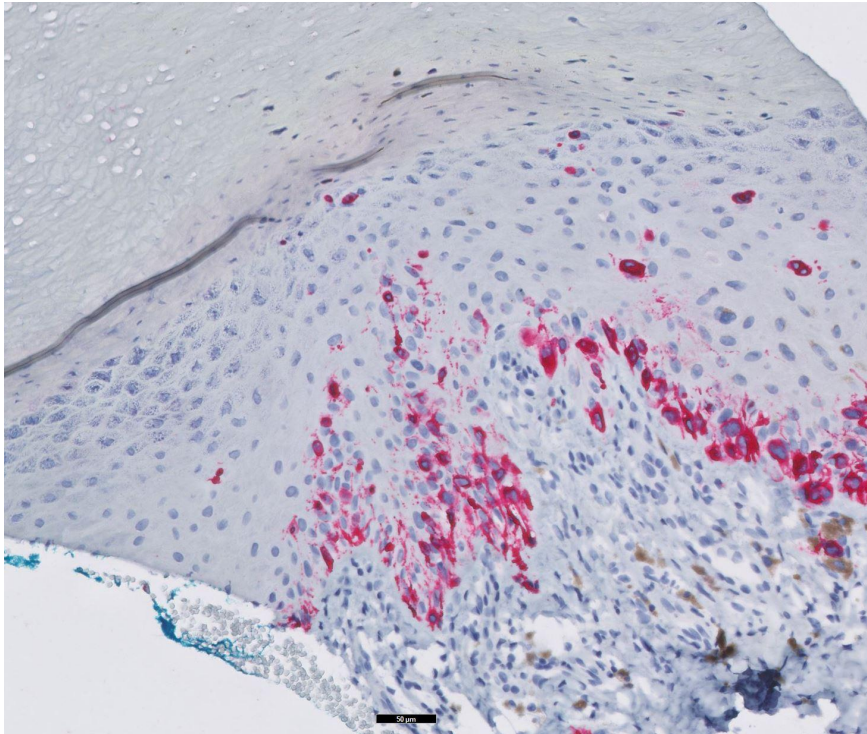
60 y/o left thumbnail



60 y/o



Melanoma in-situ



Case

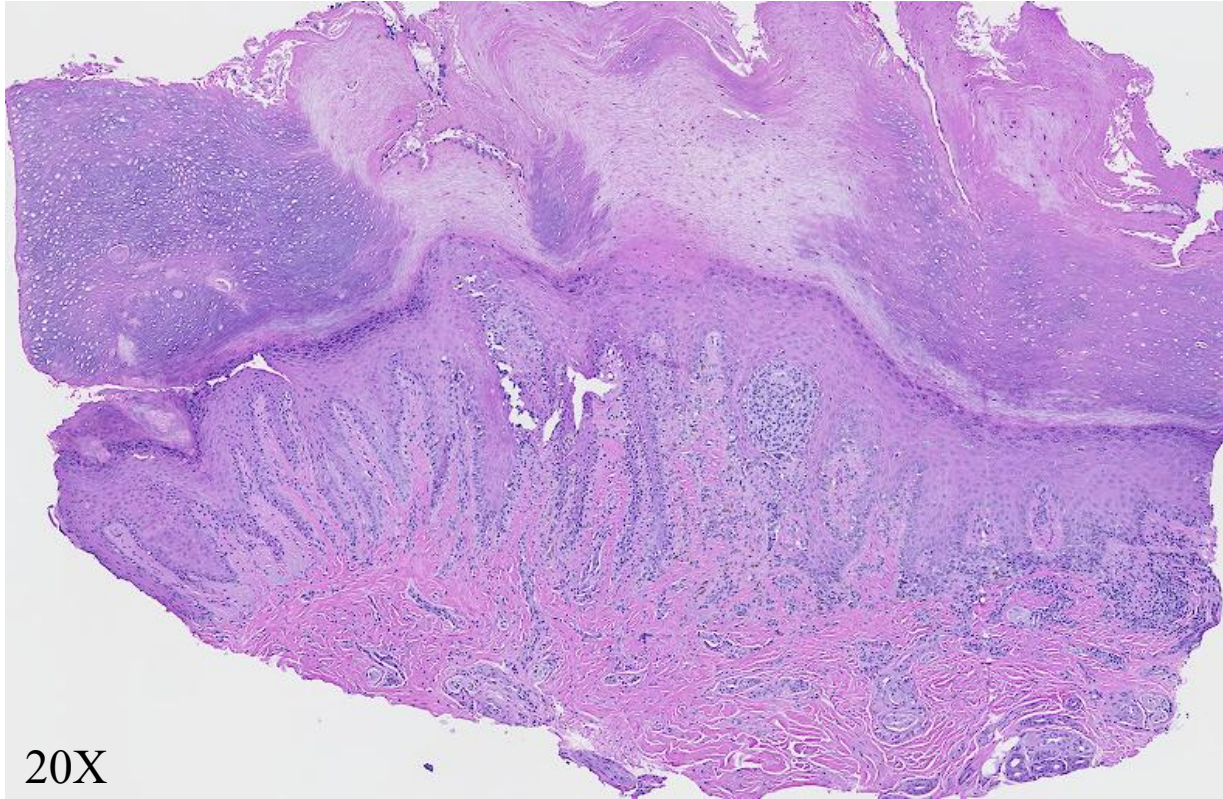
- 61 y/o female
- Right thumbnail
- Patient of Dr. Zaiac



Clinical Information

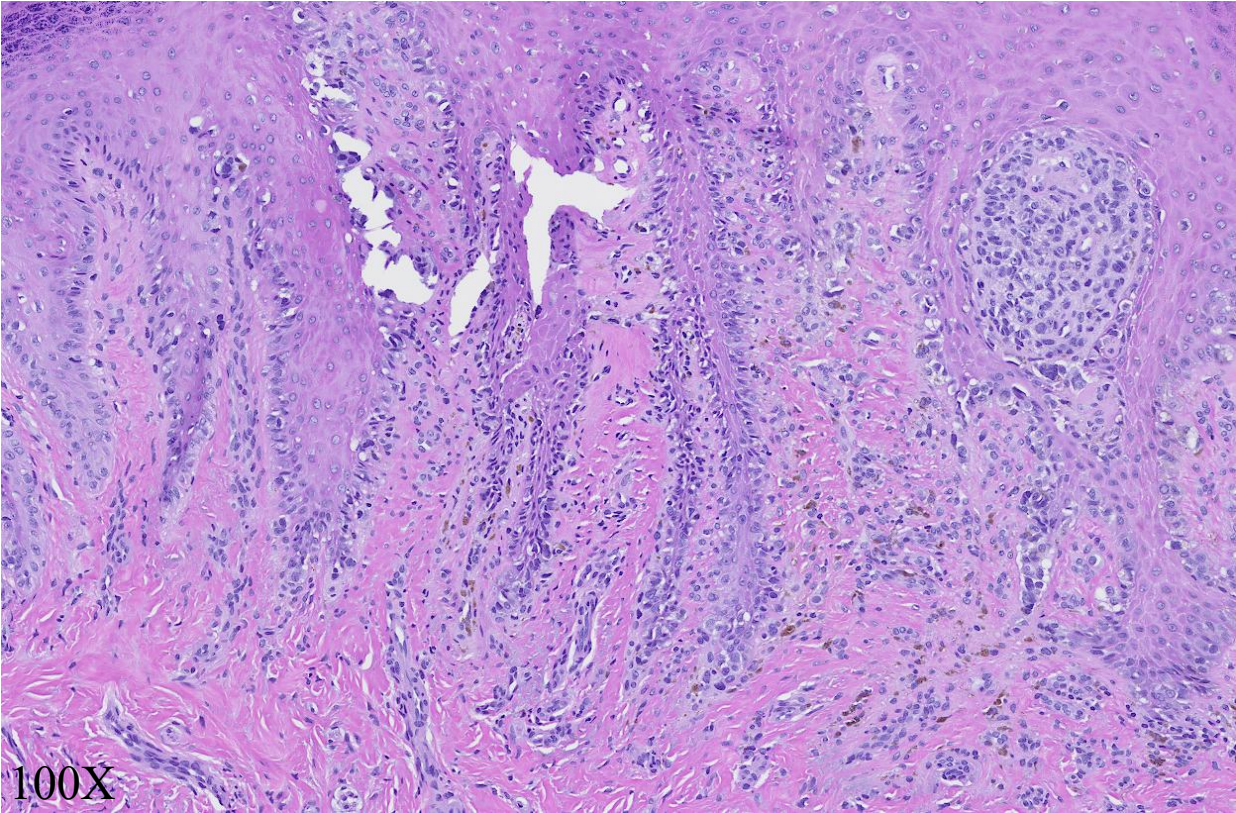
Morphology: irregular brown papule
DDX: Atypical Junctional Melanocytic Neoplasm

61 y/o female right thumbnail

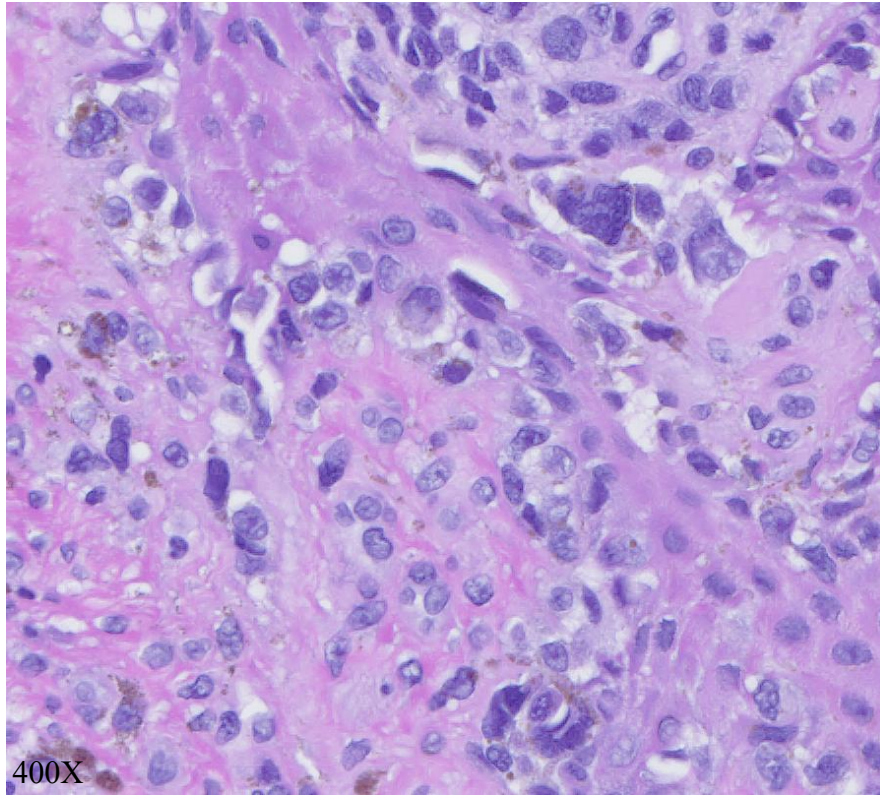


20X

61 y/o female right thumbnail



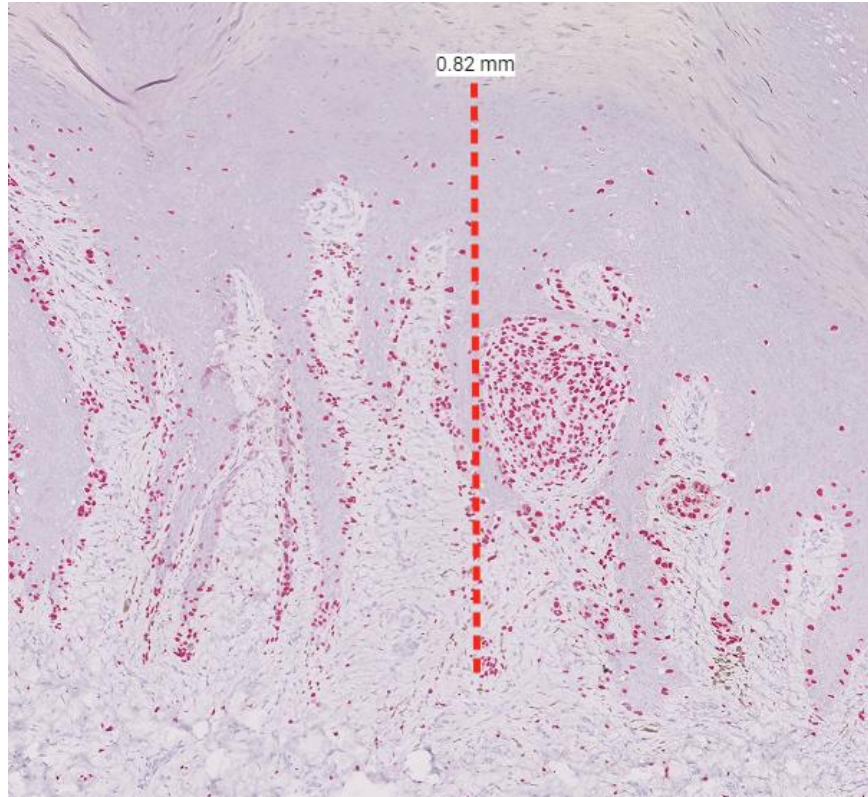
61 y/o female right thumbnail



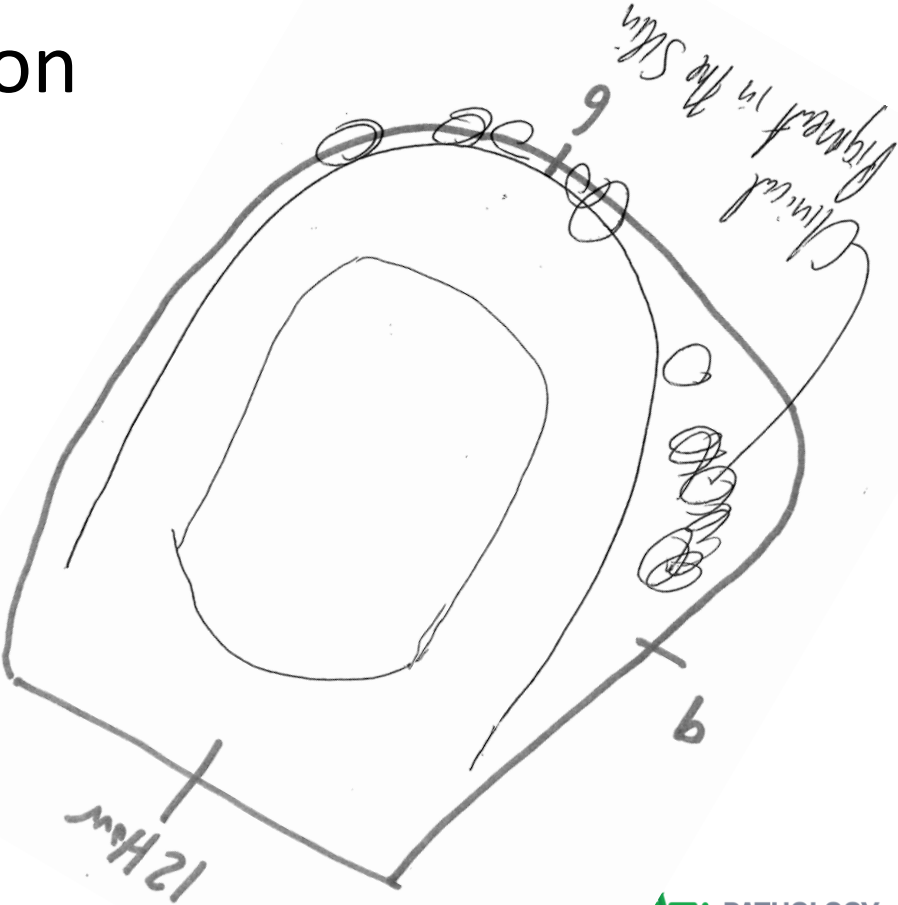
400X

61 y/o female right thumbnail

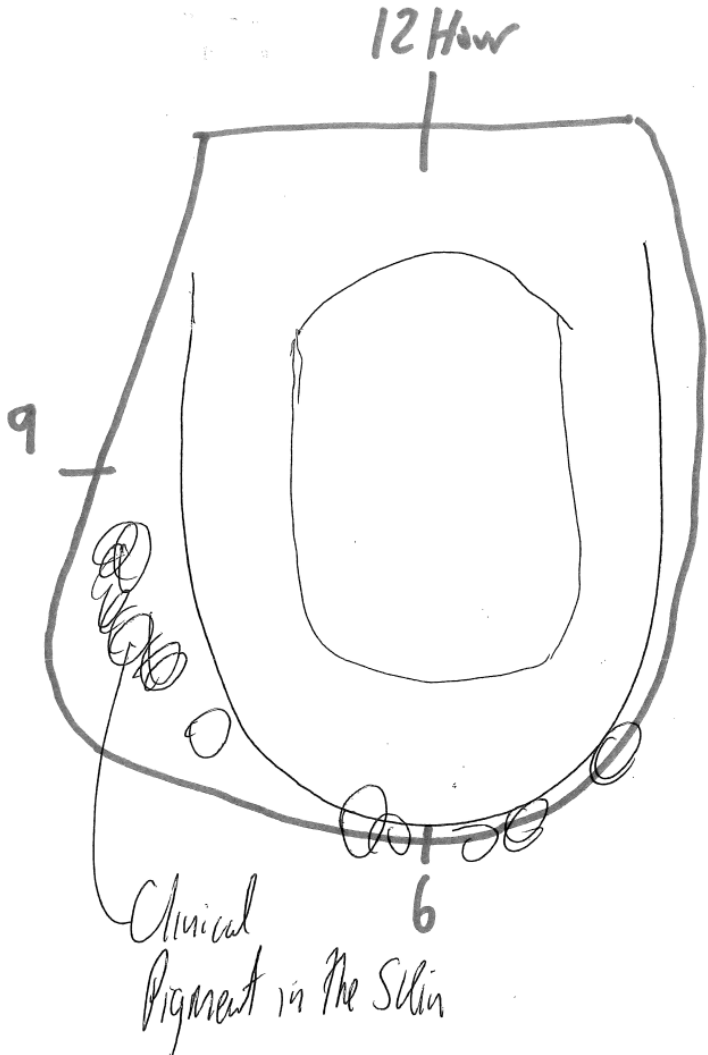
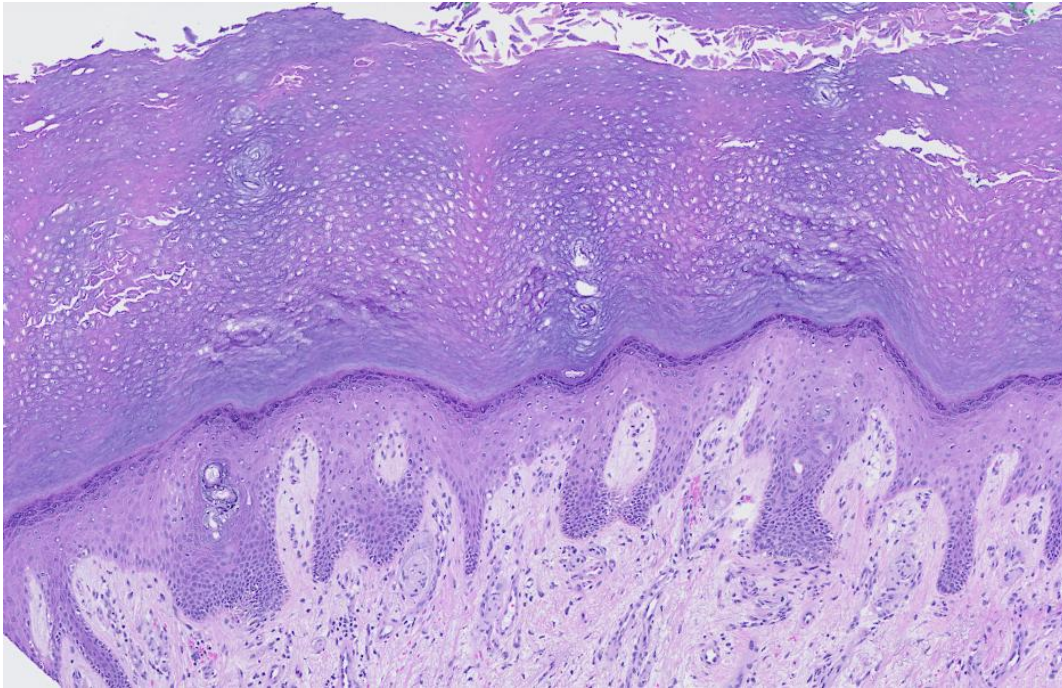
- Breslow 0.82mm
- Stage pT1a



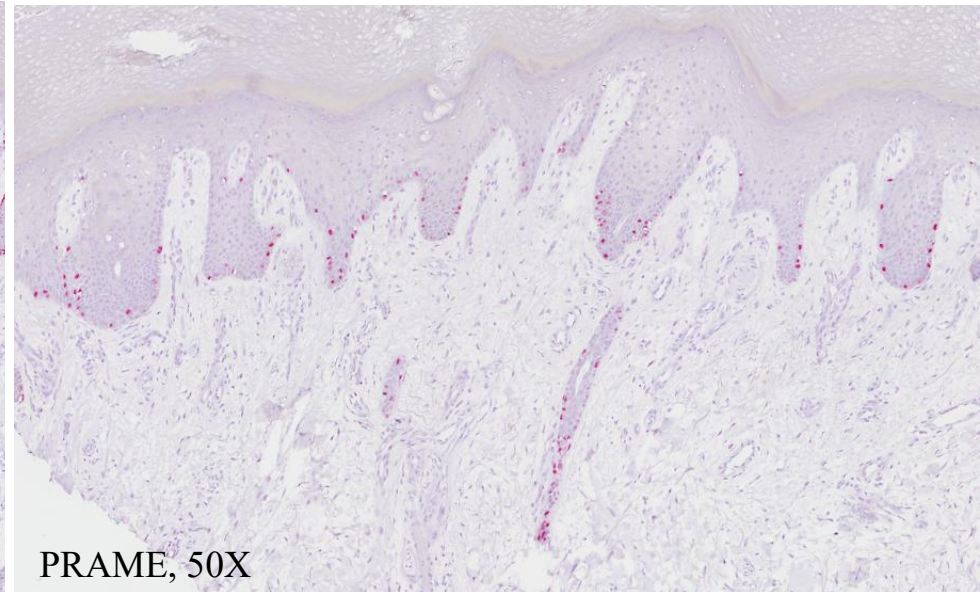
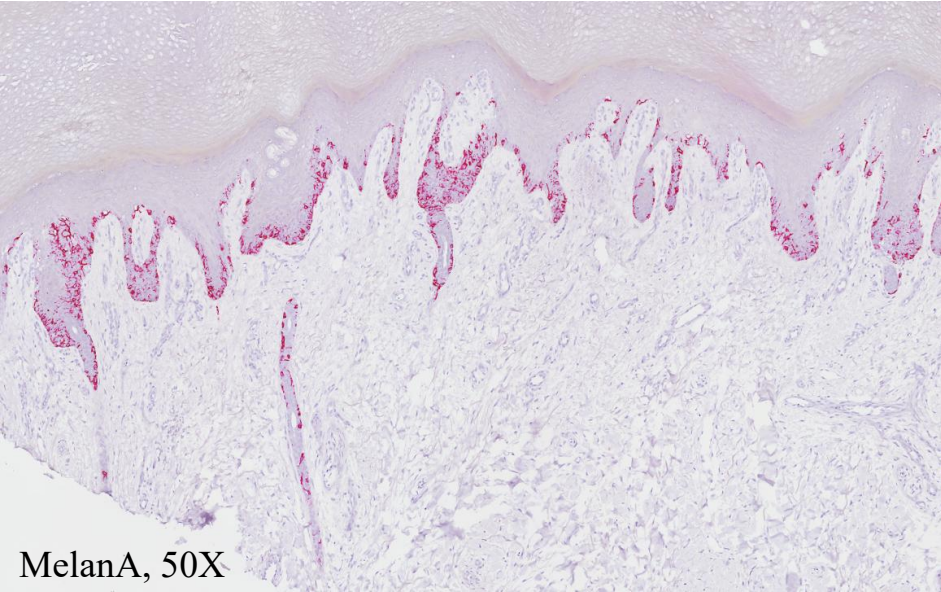
61 y/o female Re-Excision



61 y/o female Re-Excision



61 y/o female Re-Excision



Longitudinal melanonychia



11/16/2010 11:41

Challenge

- Identifying source of clinical pigmentation



Finding the pigment

- H&E with initial levels

- MelanA IHC

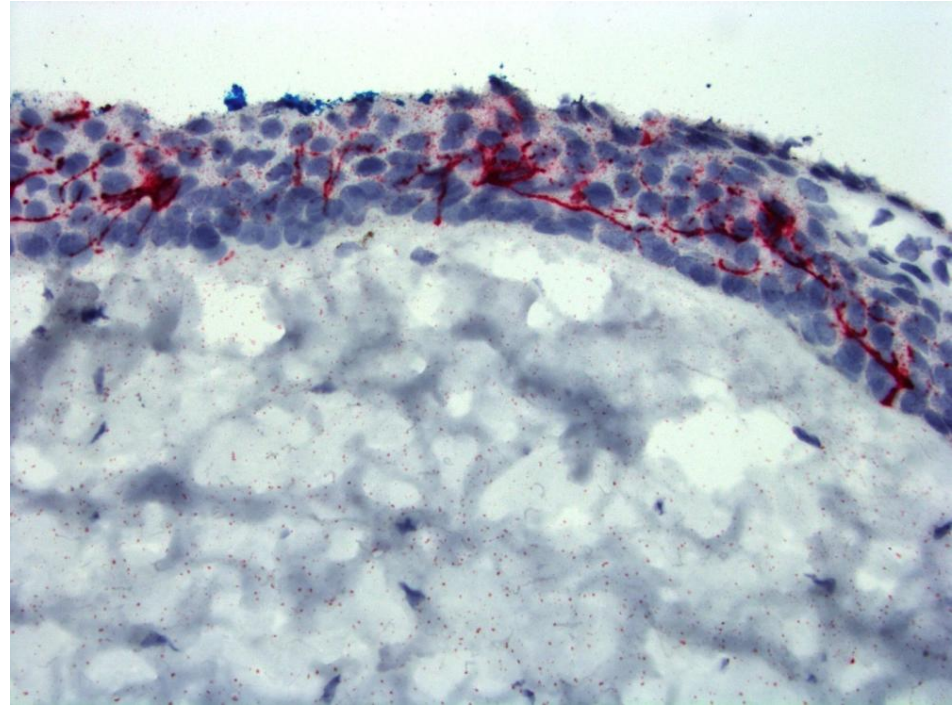
- Fontana-Masson

- PAS fungus

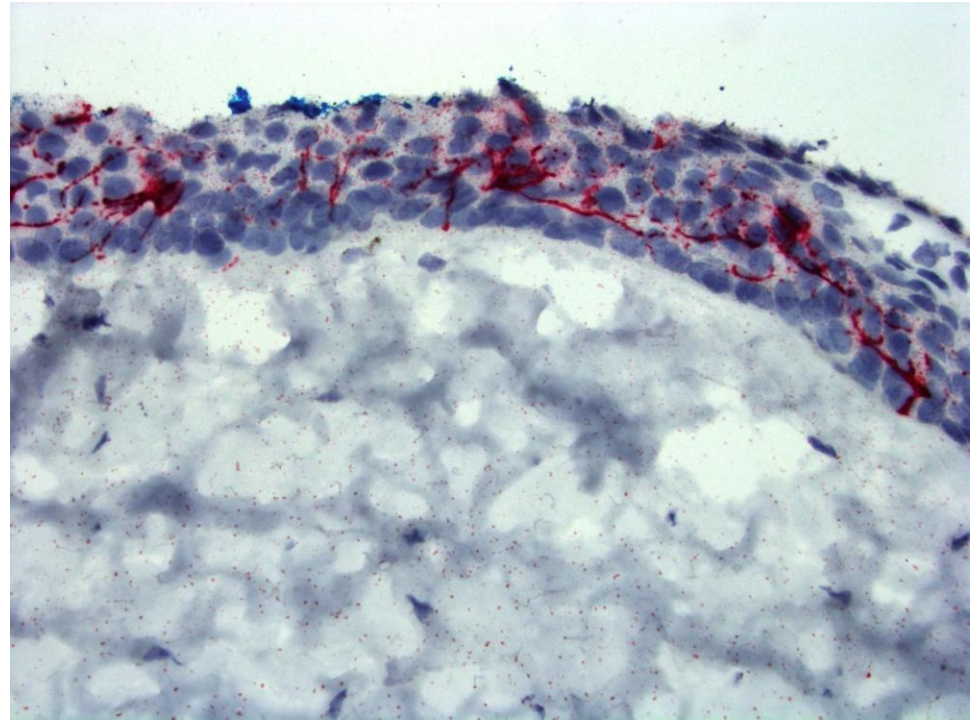
- Unstained slides

Immunohistochemistry

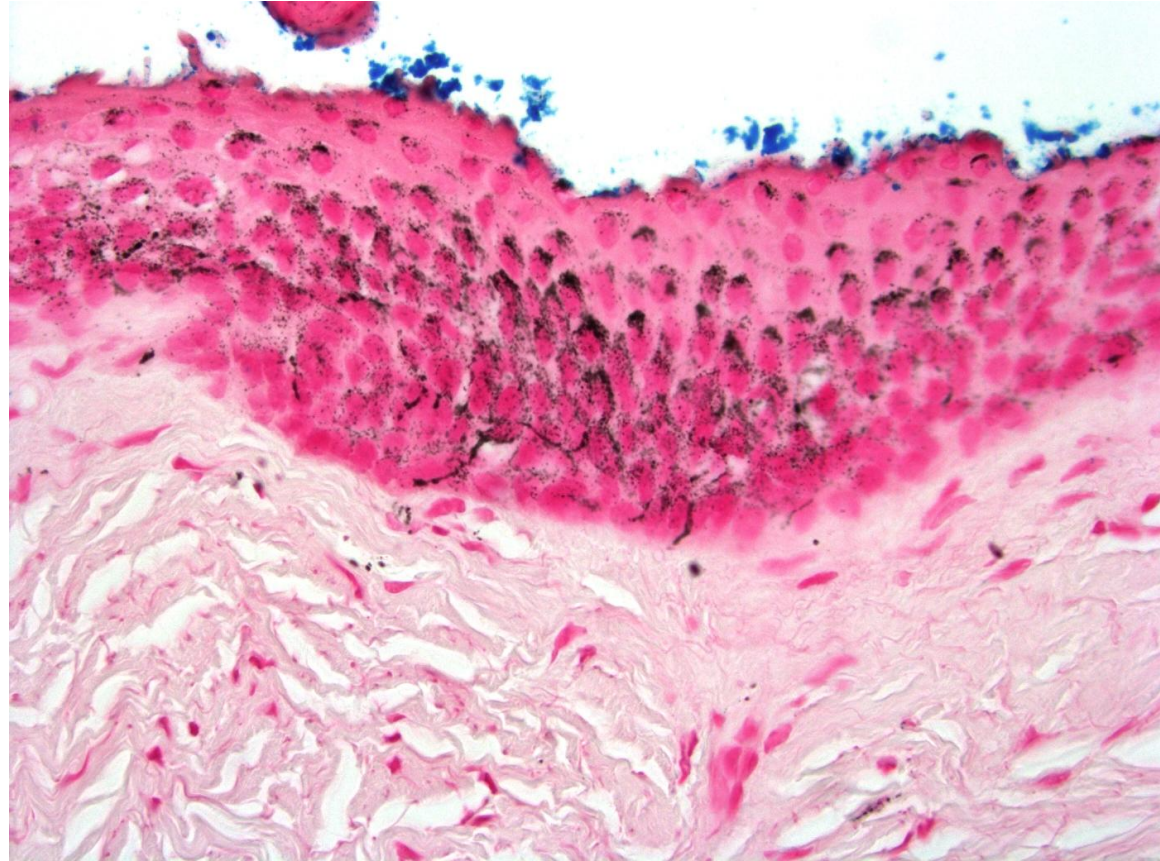
- Melanocyte density
- Red chromogen



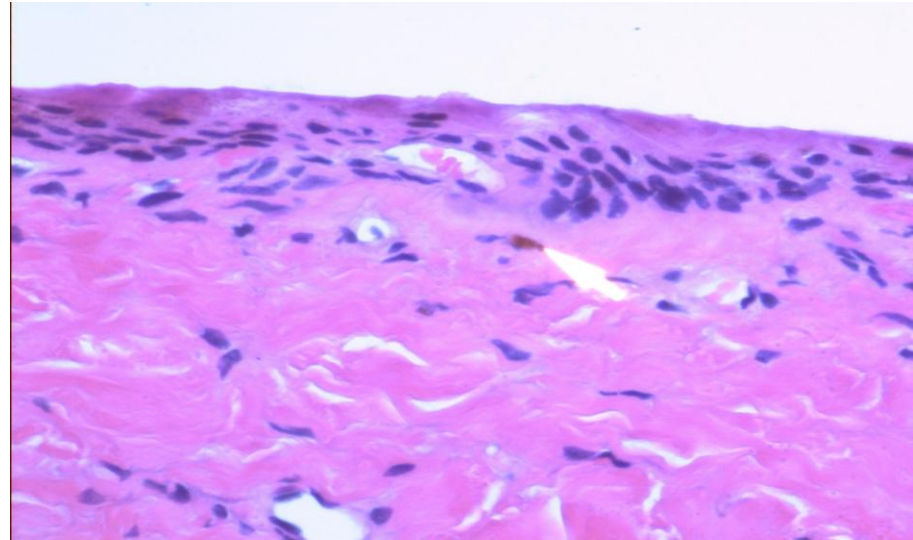
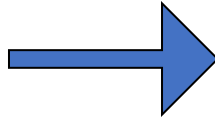
MelanA/Mart-1 is better than SOX-10



Fontana-Masson Stain



Finding subtle pigment



Benign Activation of Junctional Melanocytes

- Synonyms
 - Melanotic macule of the nail
 - Nail unit lentigo

Benign Activation of Junctional Melanocytes

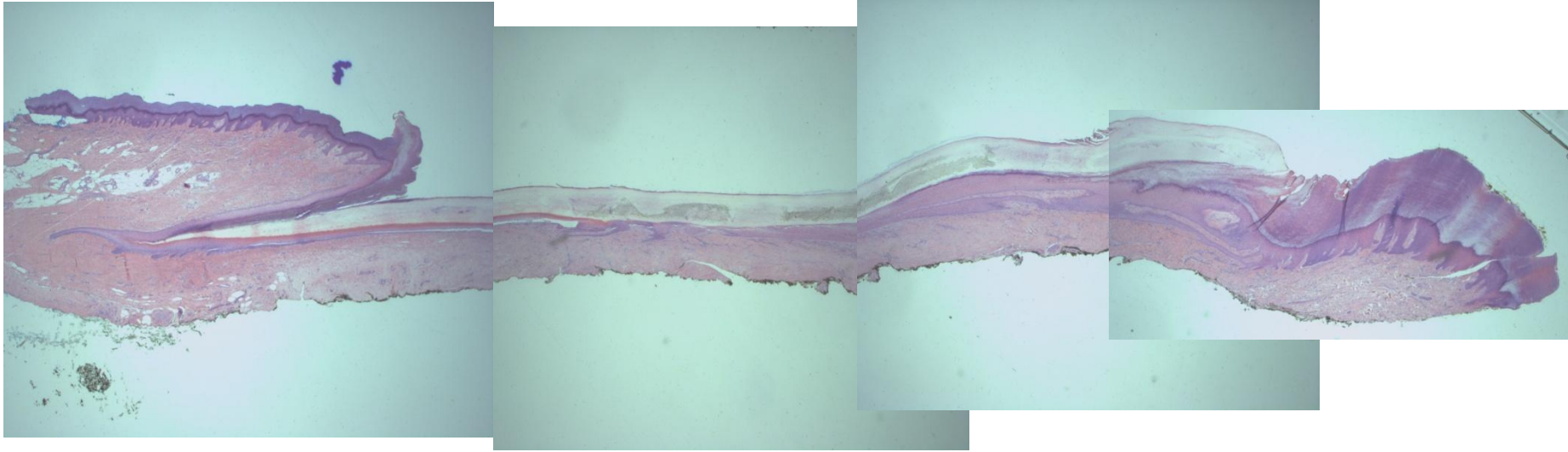
- Similar to benign solar lentigo



Hutchinson's Sign



Hutchinson's Sign



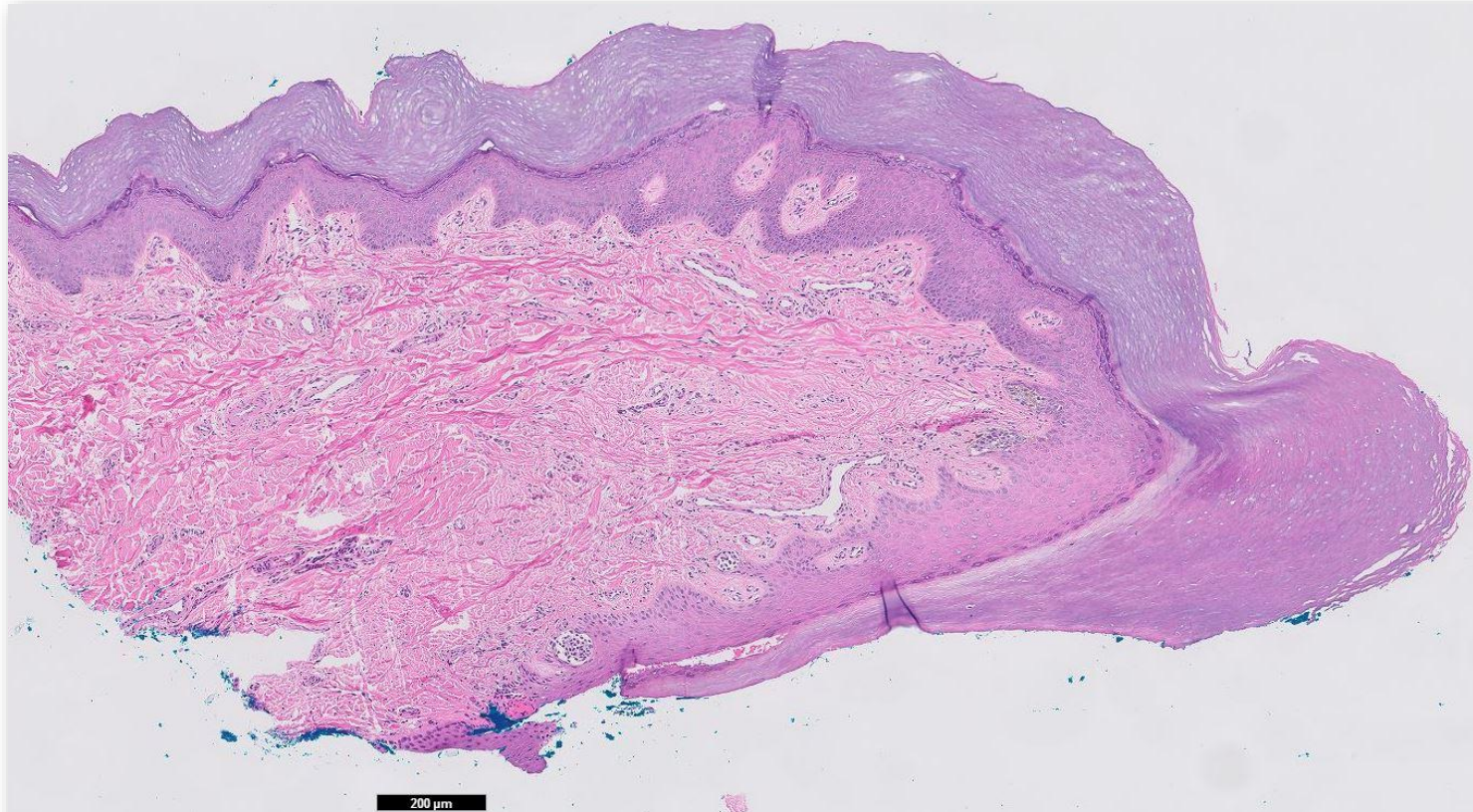
Hutchinson's Sign

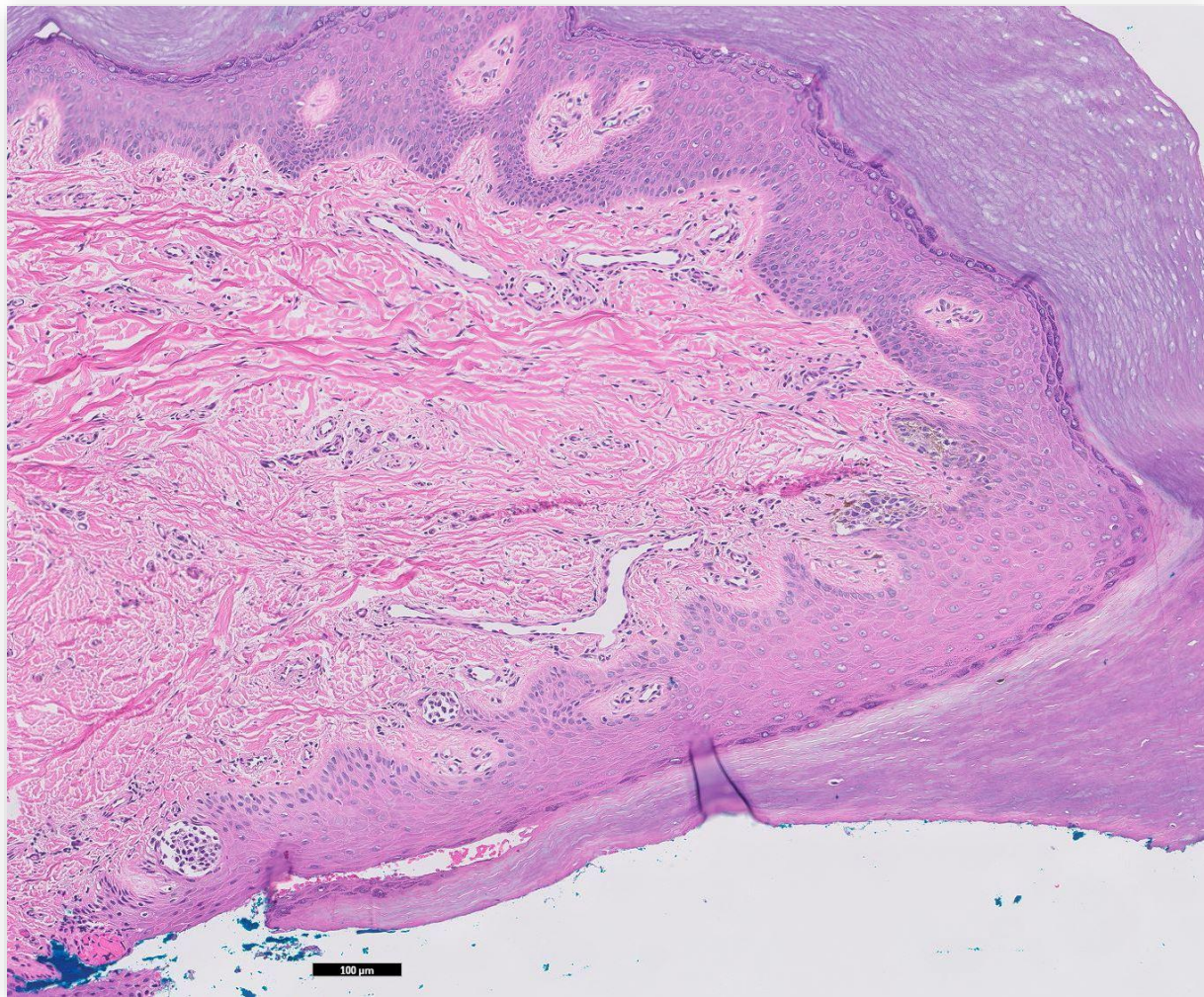
- [J Am Acad Dermatol](#). 2001 Feb;44(2):305-7.
- **Two kinds of Hutchinson's sign, benign and malignant.**
- [Kawabata Y](#), [Ohara K](#), [Hino H](#), Tamaki K.
- Department of Dermatology, Faculty of Medicine, University of Tokyo, Japan.
KAWABATA-der@h.u-tokyo.ac.jp
- We examined 6 subungual melanomas in situ and 18 melanocytic nevi and compared pigmentation of the nail plates and hyponychium with the use of a dermatoscope. Hutchinson's sign on the hyponychium was not always evidence of subungual melanoma because it can be seen in both diseases. However, there was a wide difference in their dermatoscopic features. We believe that observation of pigmentation on the hyponychium with the use of a dermatoscope contributes to the precise diagnosis of subungual melanoma.

- 10 y/o male with pigmented nail of great toe. It appeared at age 3.

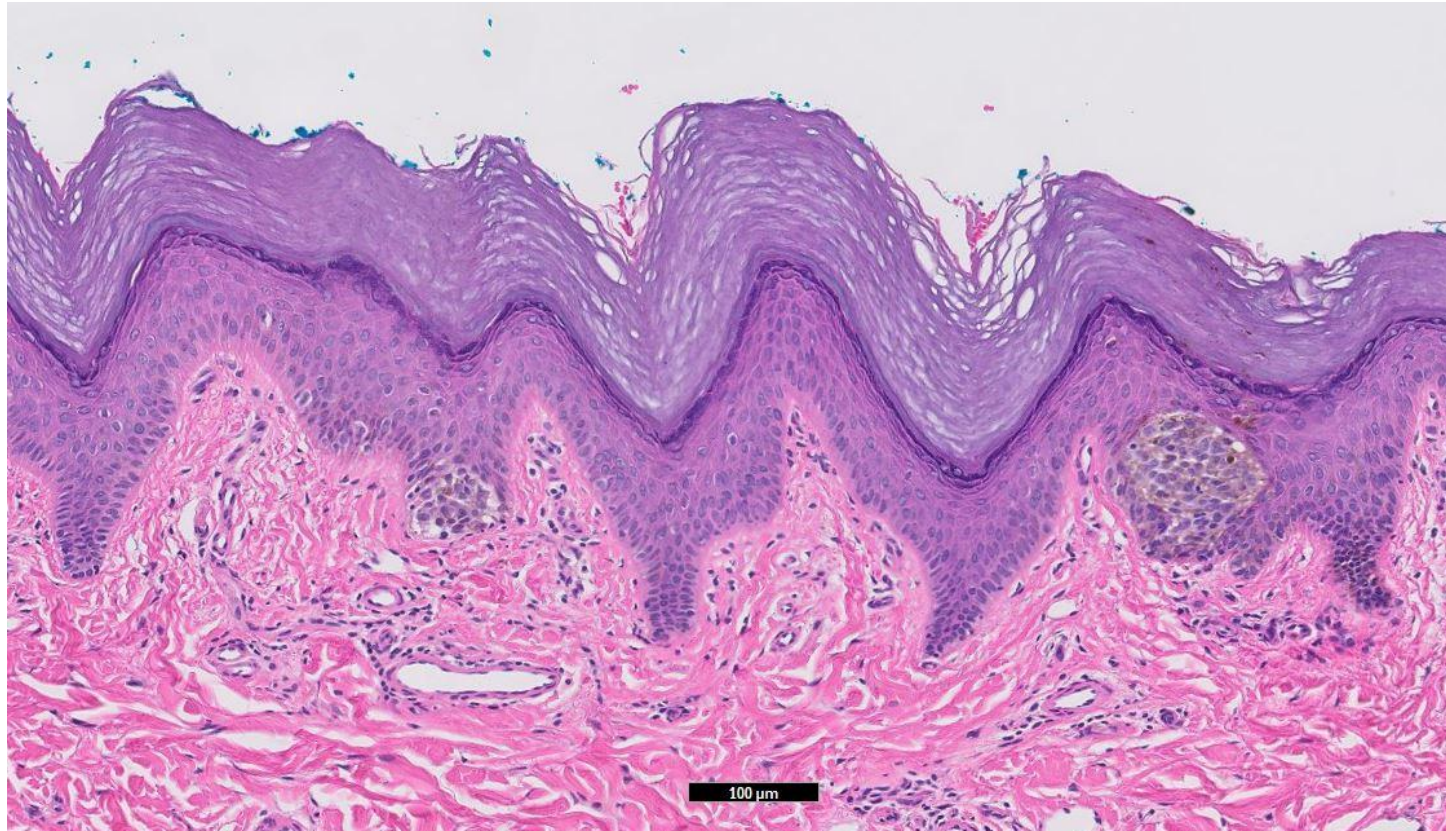


10 y/o boy

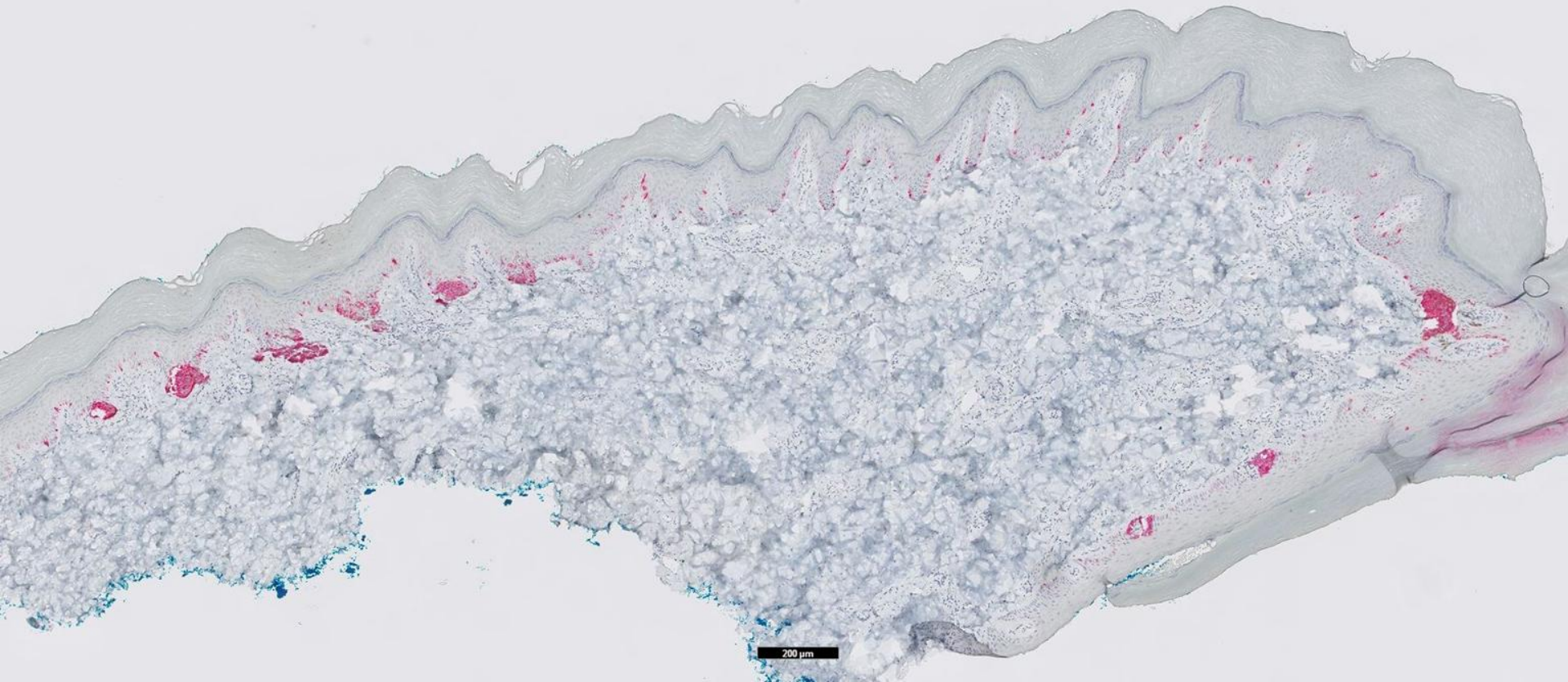




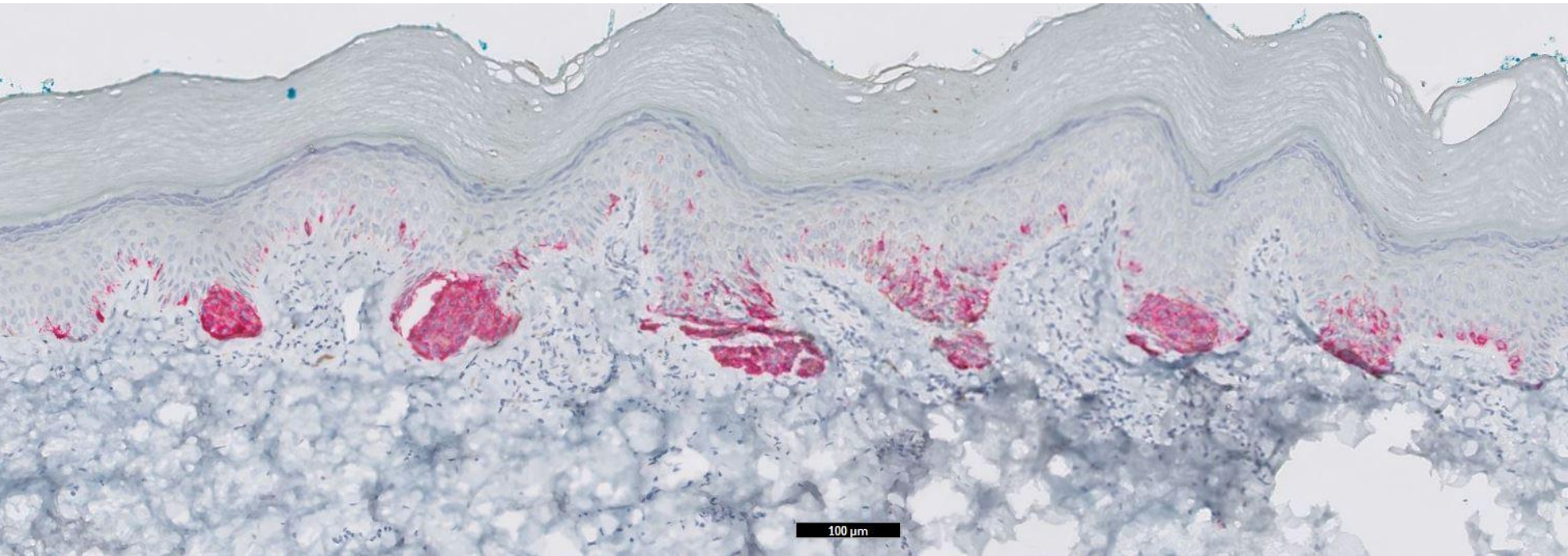
Proximal nail fold



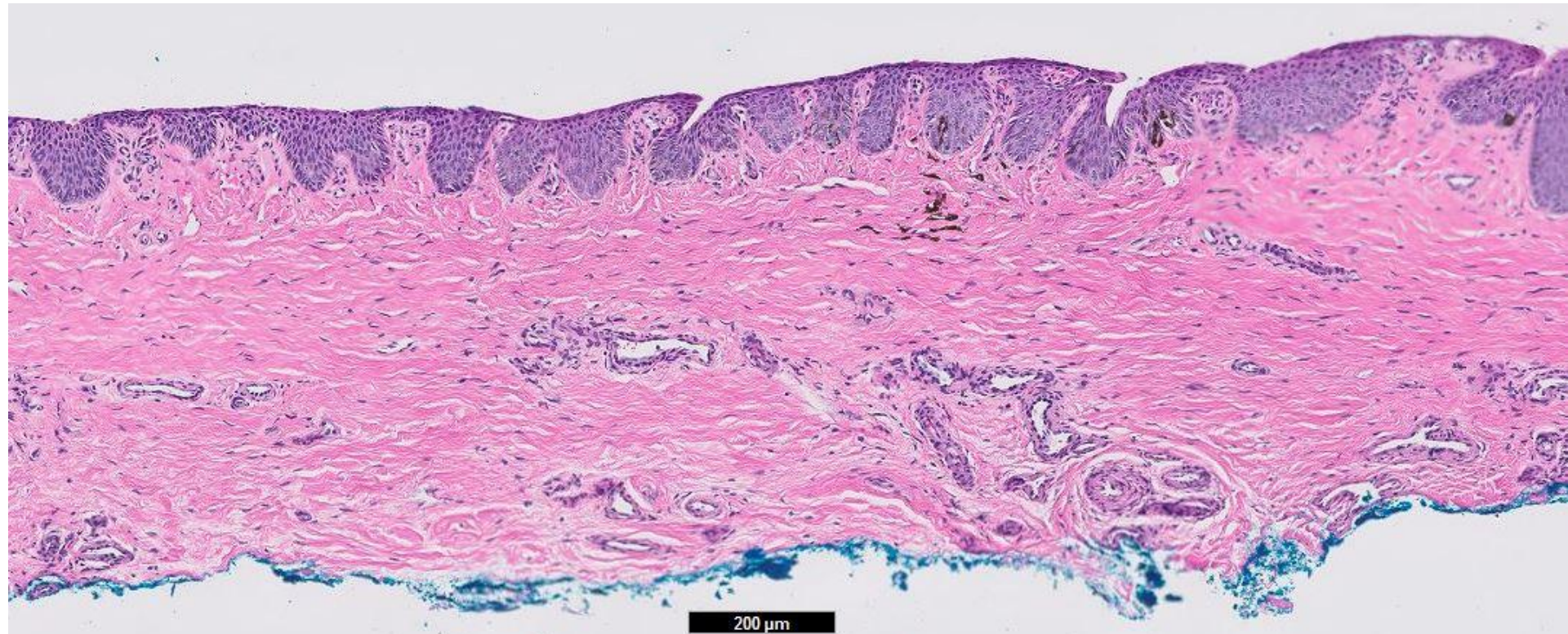
10 y/o



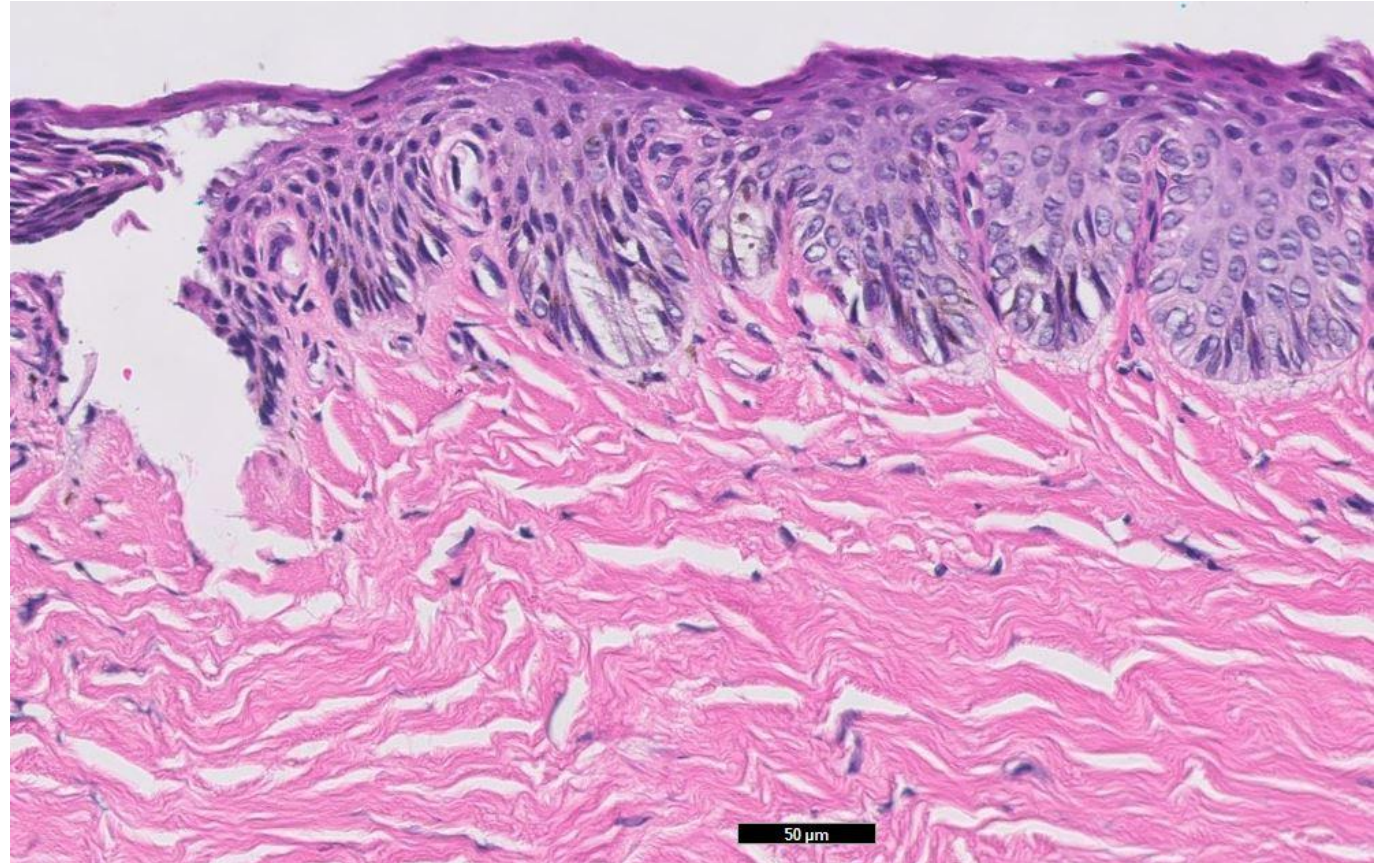
Proximal nail fold



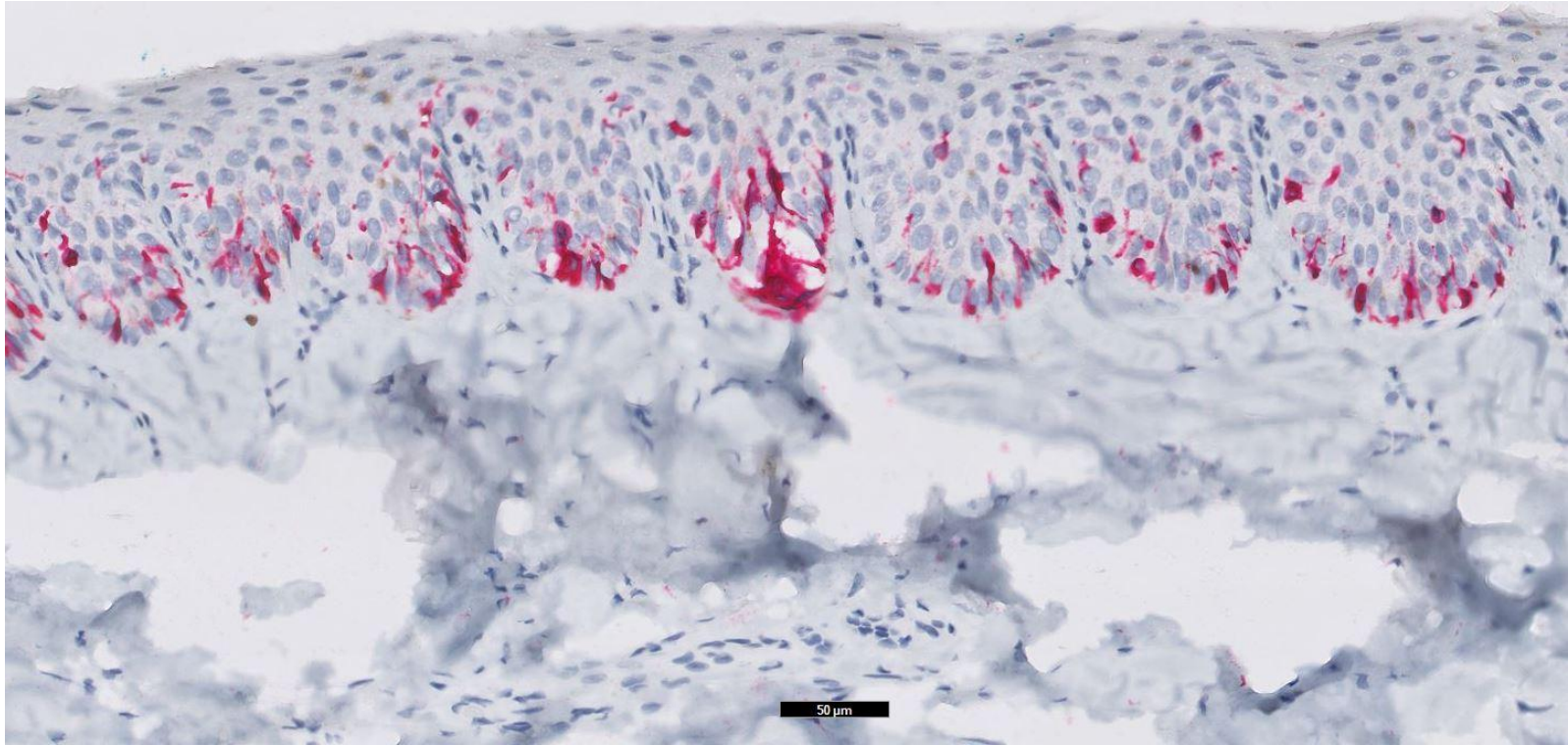
Nail bed/matrix



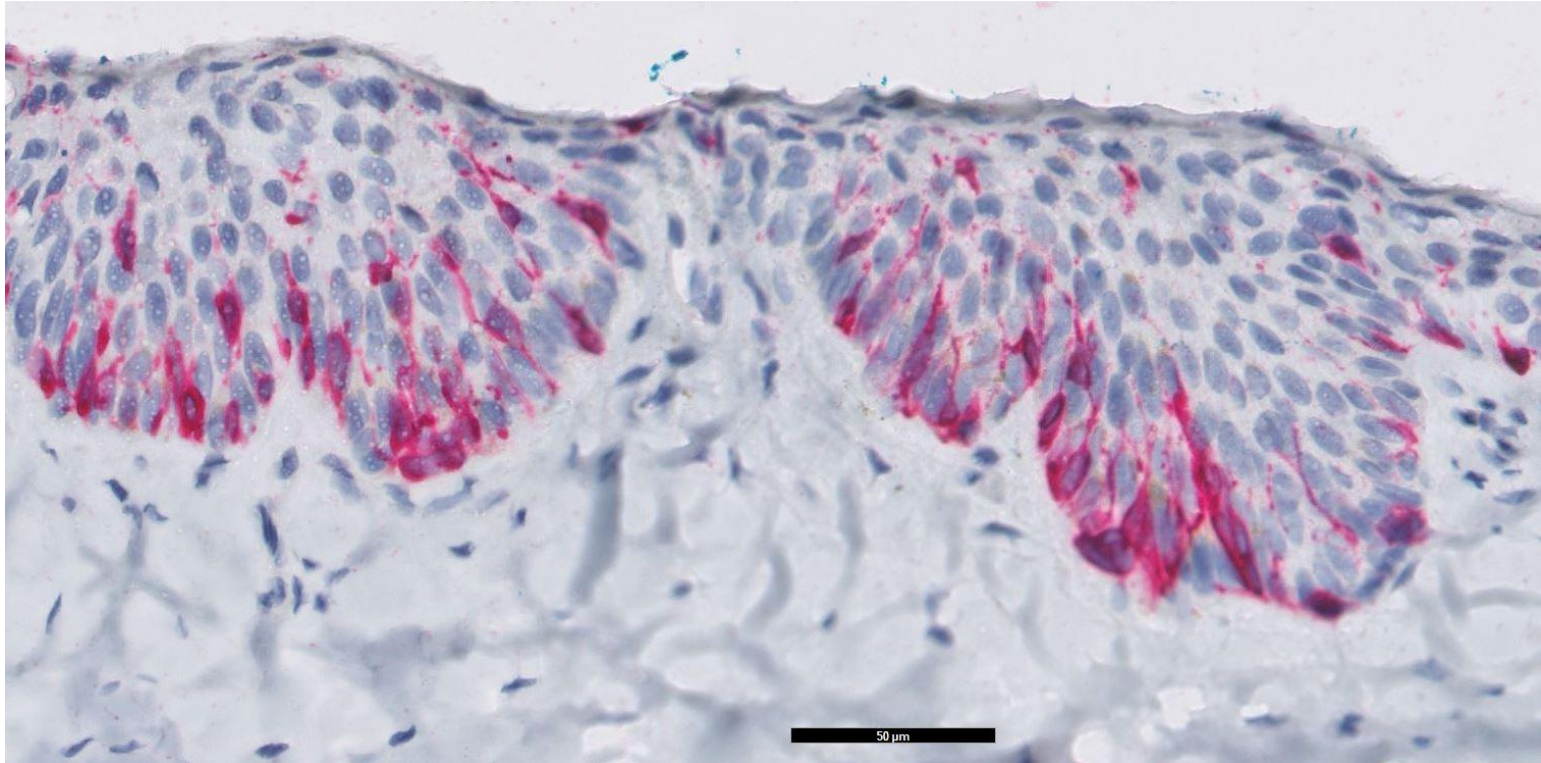
10 y/o nail bed/matrix



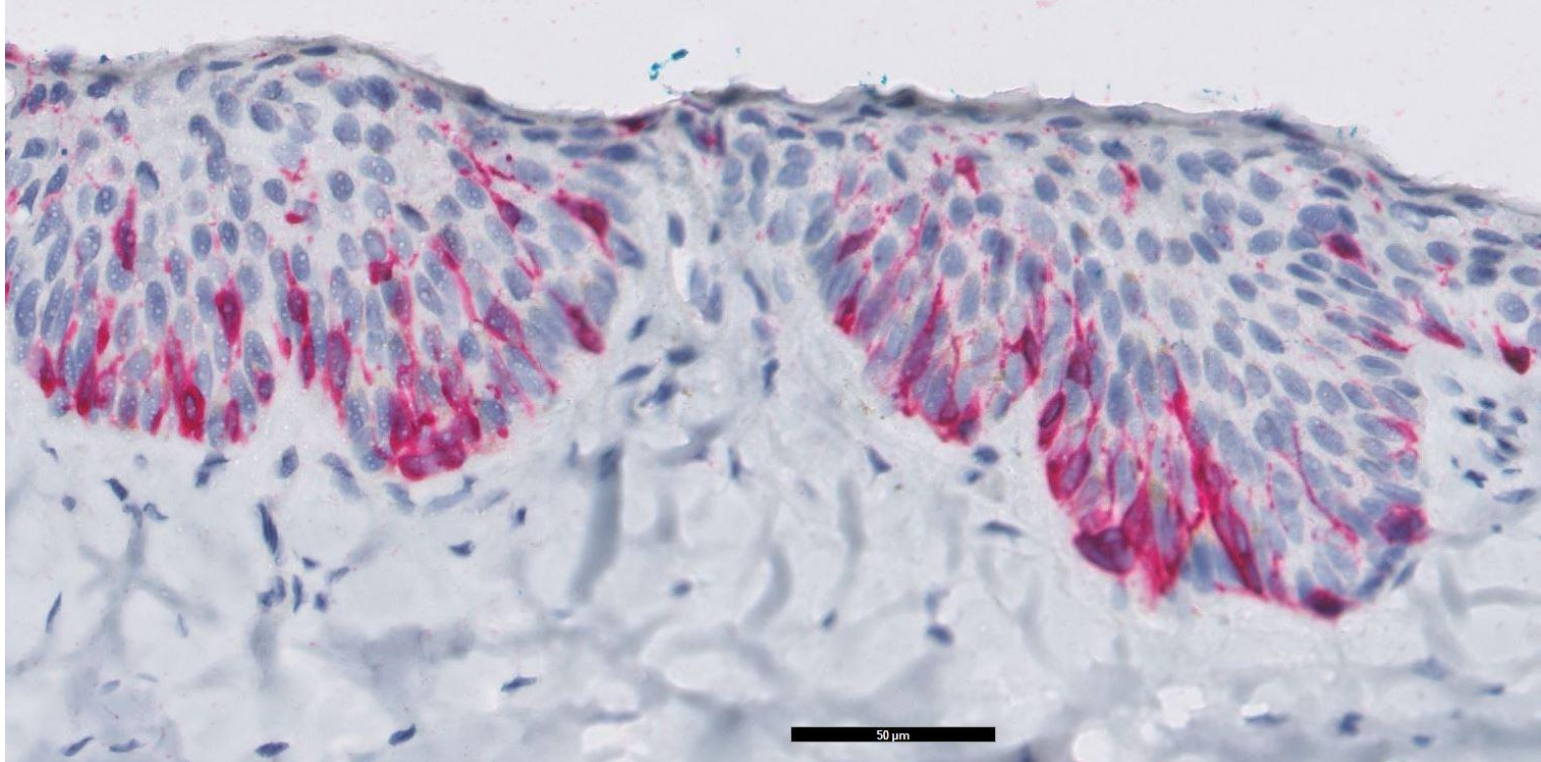
Nail bed/matrix



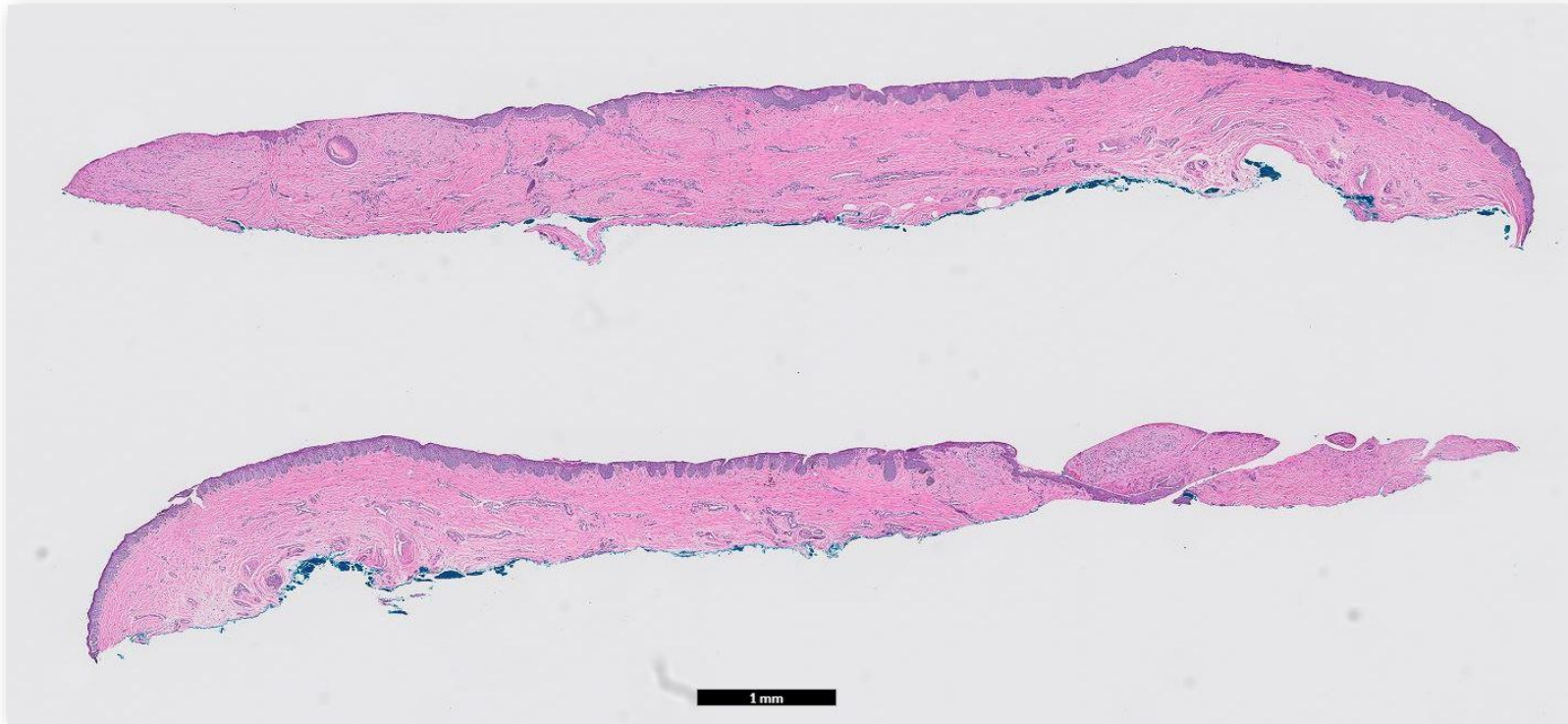
Nail bed/matrix



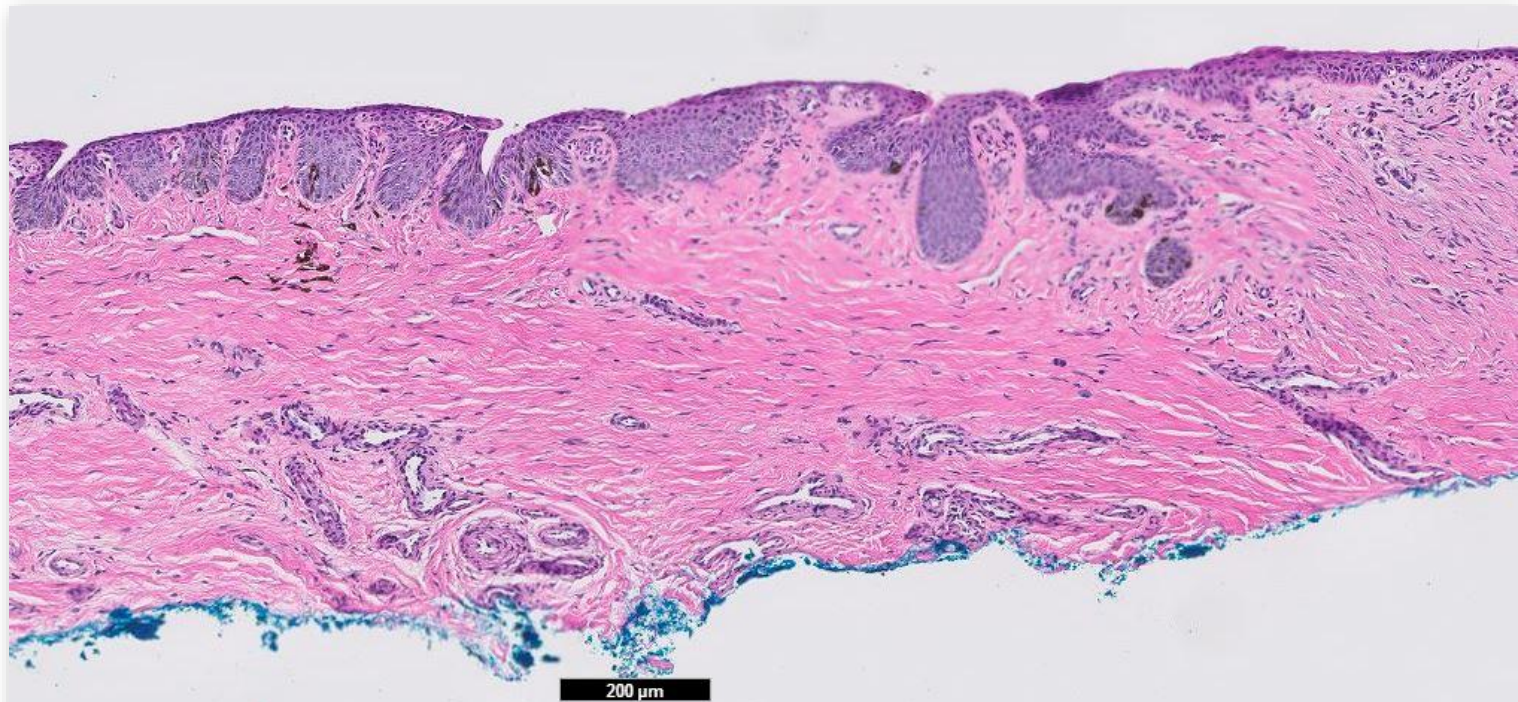
Benign nevus in 10 y/o



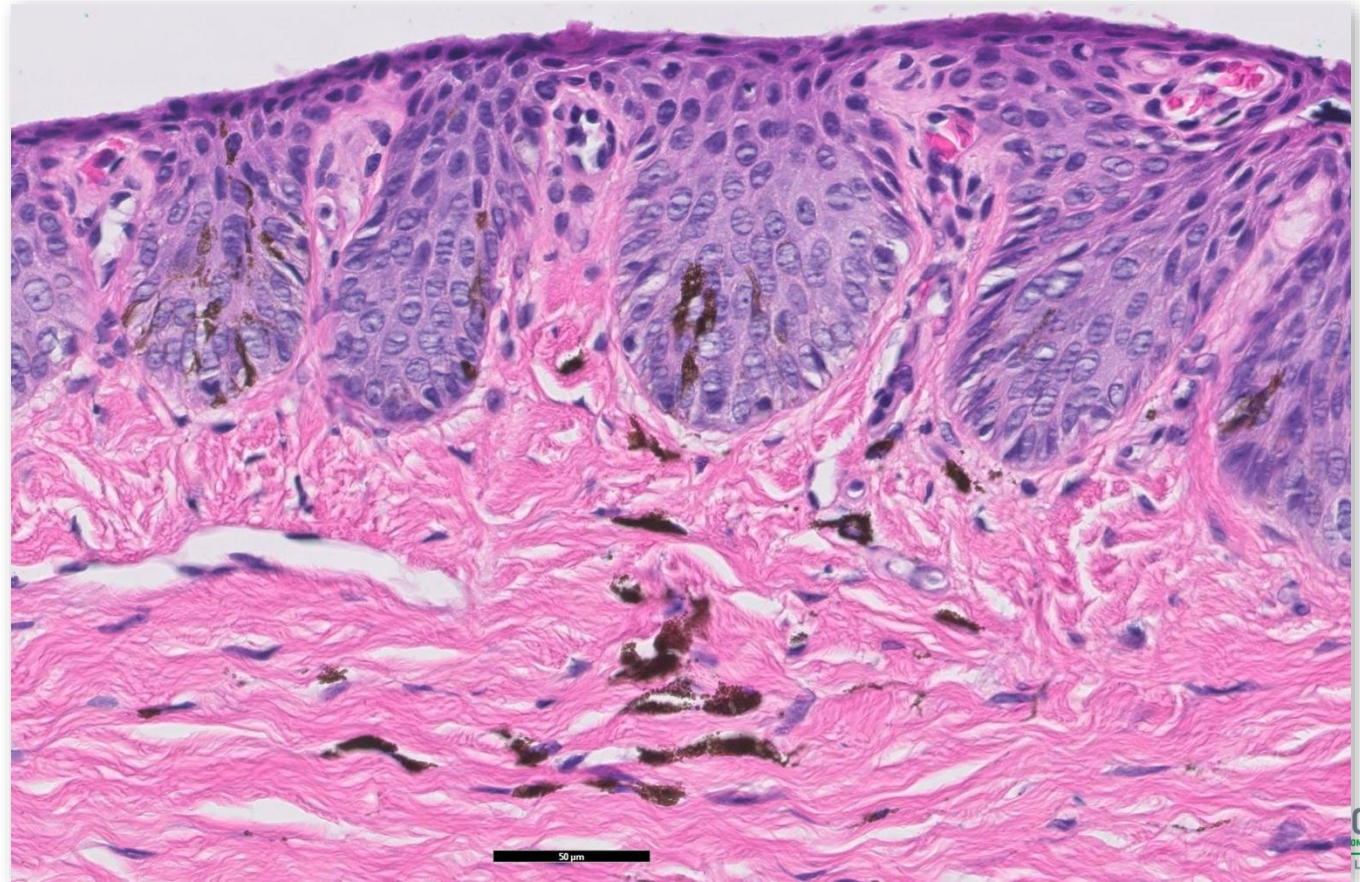
13 y/o male



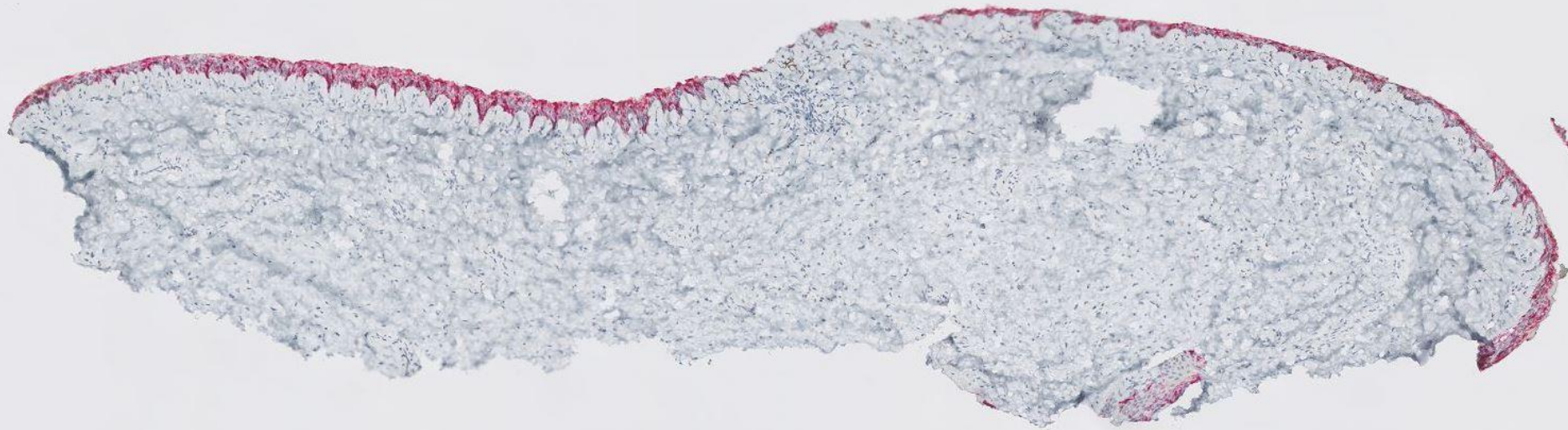
13 y/o male



13 y/o male



13 y/o nailbed



200 μ m

Pigmented lesion in a child

- Often type III skin type or above (worry about acral lentiginous MM)
- Concern to parents—pressure to biopsy
- Biopsy usually shows large, single, Spitzoid melanocytes (?Atypia?)—PRAME++

Pigmented lesion in a child

- Few pediatric melanocytic tumors sampled—nail experts do not sample
- Traditional criteria for benign vs atypical vs malignant do not apply

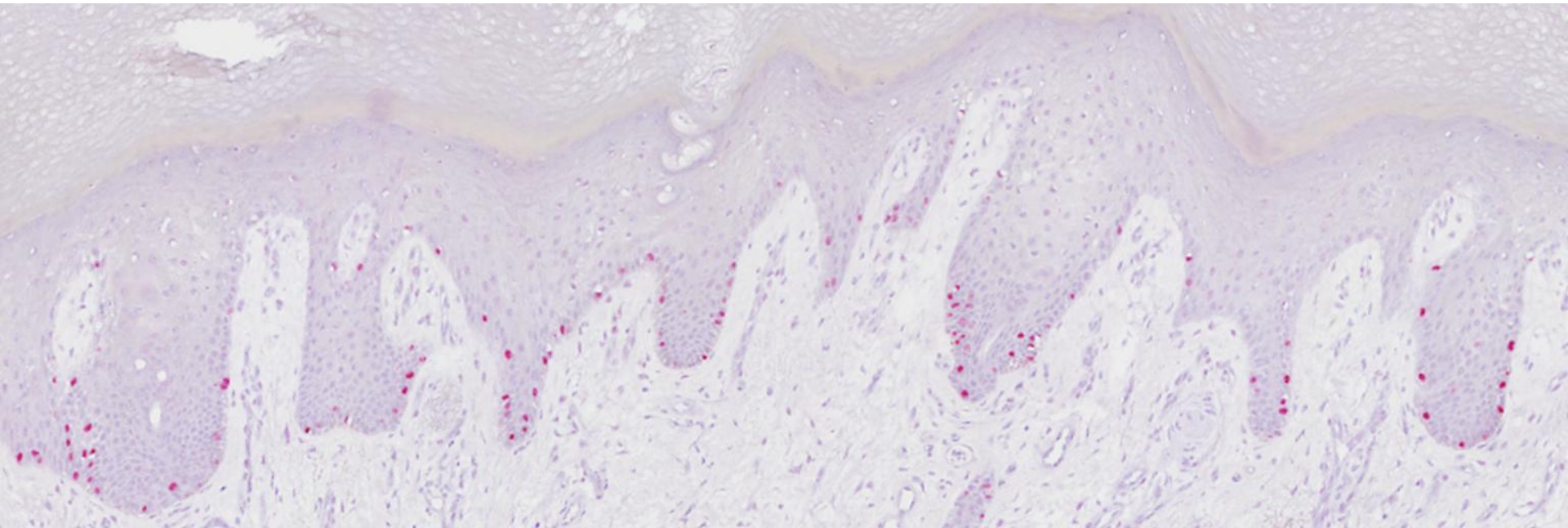
Molecular markers—B9 vs malignant

Cyclin D1 and PRAME expression in distinguishing melanoma in situ from benign melanocytic proliferation of the nail unit

[Young Jae Kim](#), [Chang Jin Jung](#), [Hyoungmin Na](#), [Woo Jin Lee](#), [Sung Eun Chang](#), [Mi Woo Lee](#), [Chan-Sik Park](#),
[Youngyoung Lim](#) ✉ & [Chong Hyun Won](#) ✉

Diagnostic Pathology **17**, Article number: 41 (2022) | [Cite this article](#)

Be careful with PRAME



A few more concepts:

- All nail neoplasms can be pigmented
- Desmoplastic melanoma often presents as painful
- Benign activation persists/recurs

Thanks!

curtis@ctapathology.com
[**www.ctapathology.com**](http://www.ctapathology.com)

