How to Biopsy the Nail Unit

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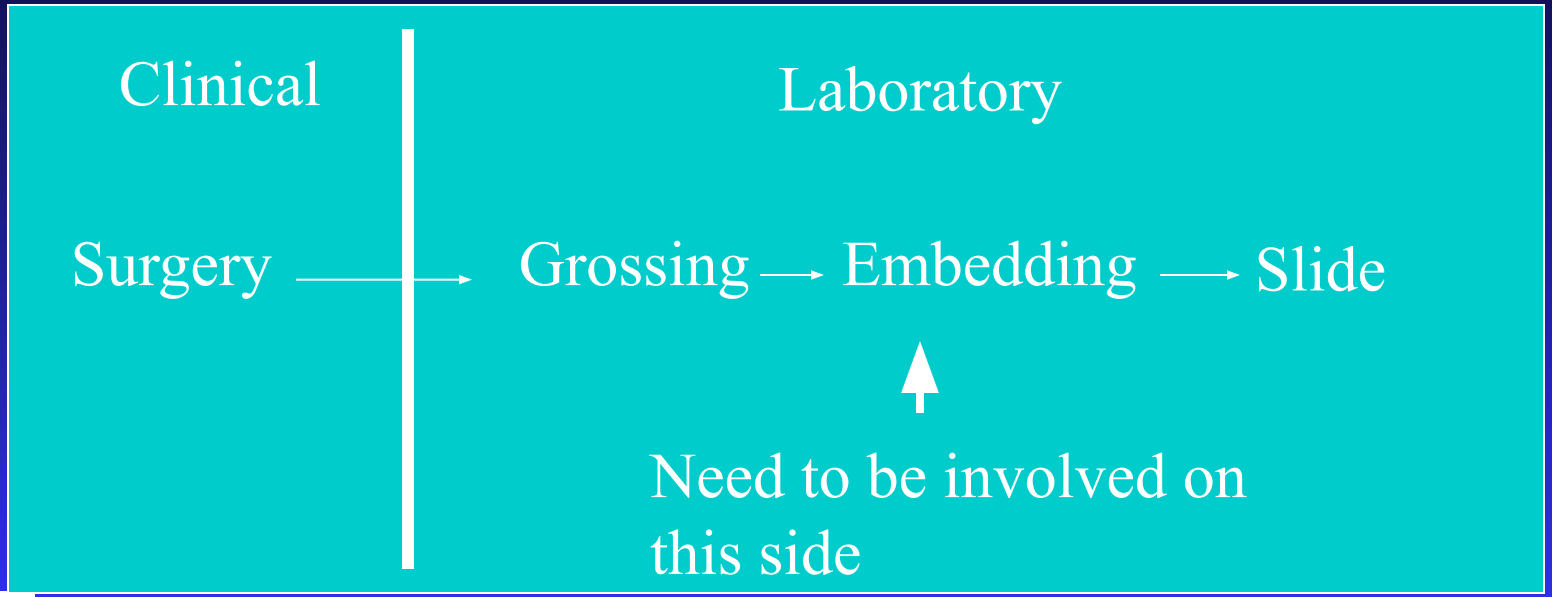
Objectives

- How/where to biopsy
- How to submit to laboratory
- Laboratory processing
- Special stain utility
- Fungal diagnostics

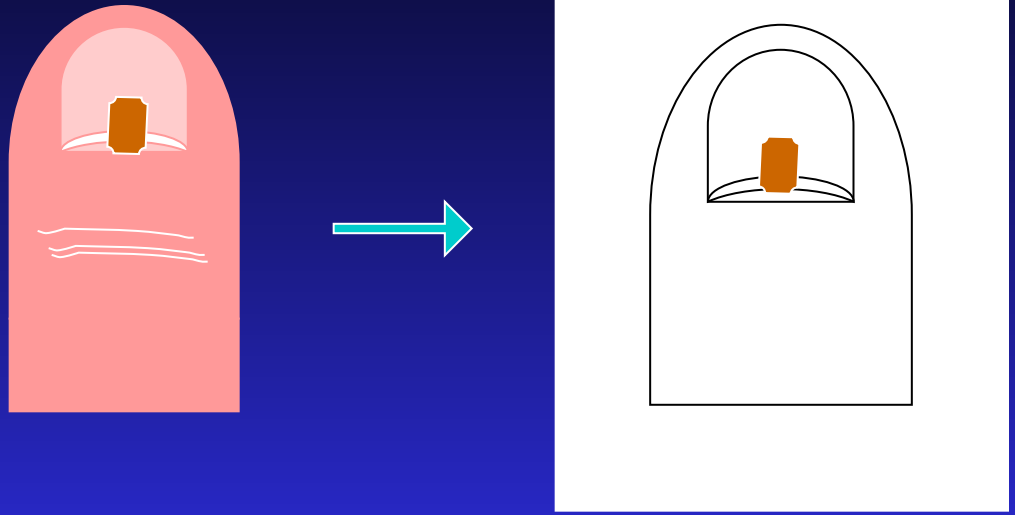
What can the nail surgeon do to submit a bed/matrix specimen for appropriate interpretation?

Need to be involved in lab prep



Need concise and clear guidelines for specimen submission:

- Orientation of tissue
- Clear information to histotechnicians
- Reproducible among different laboratories



Courtesy of Dr. Phoebe Rich

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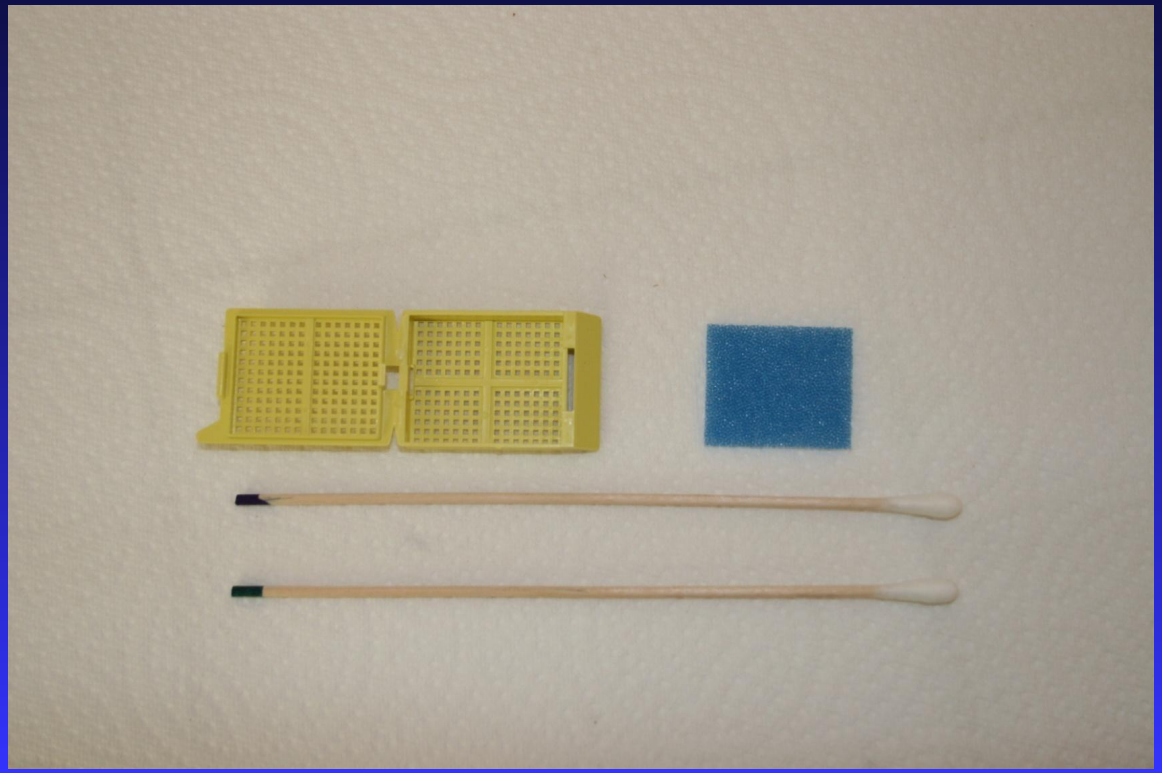
Histology Materials



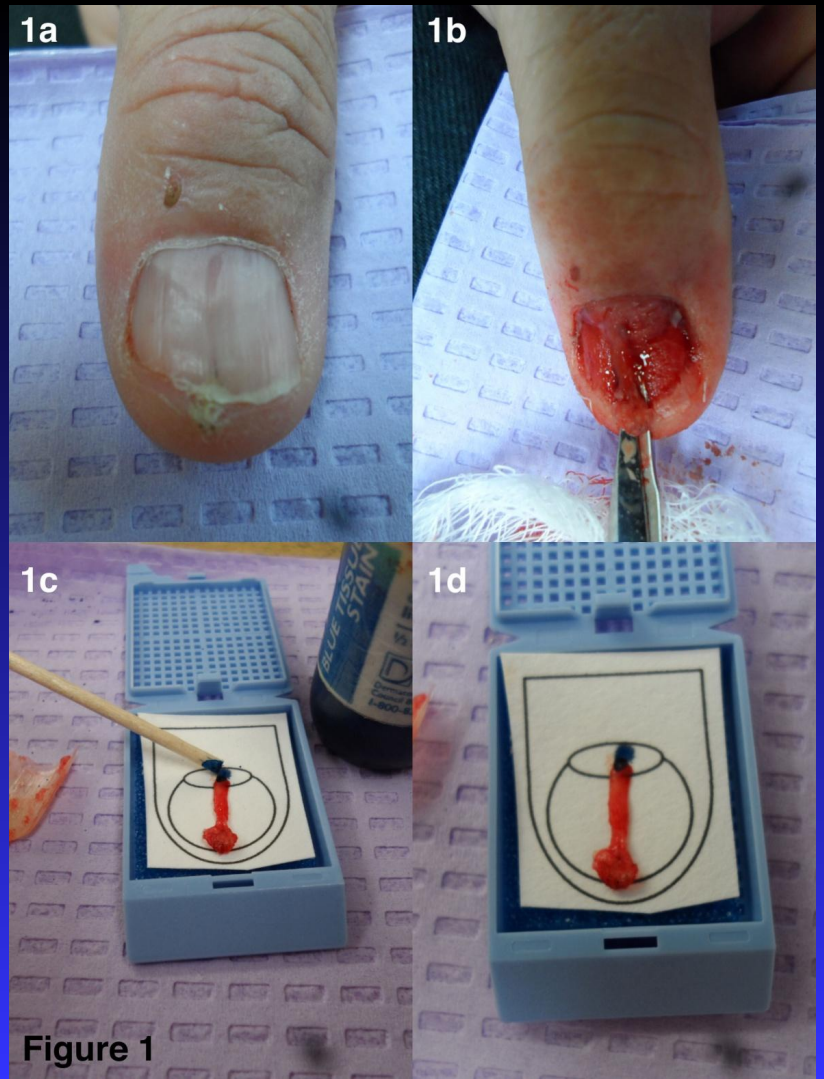


Figure 1

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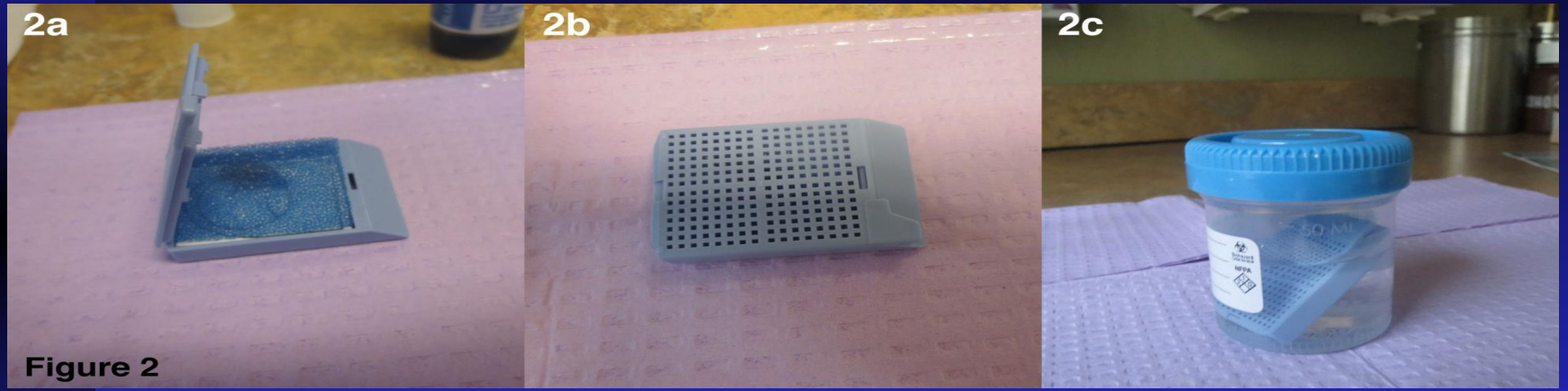

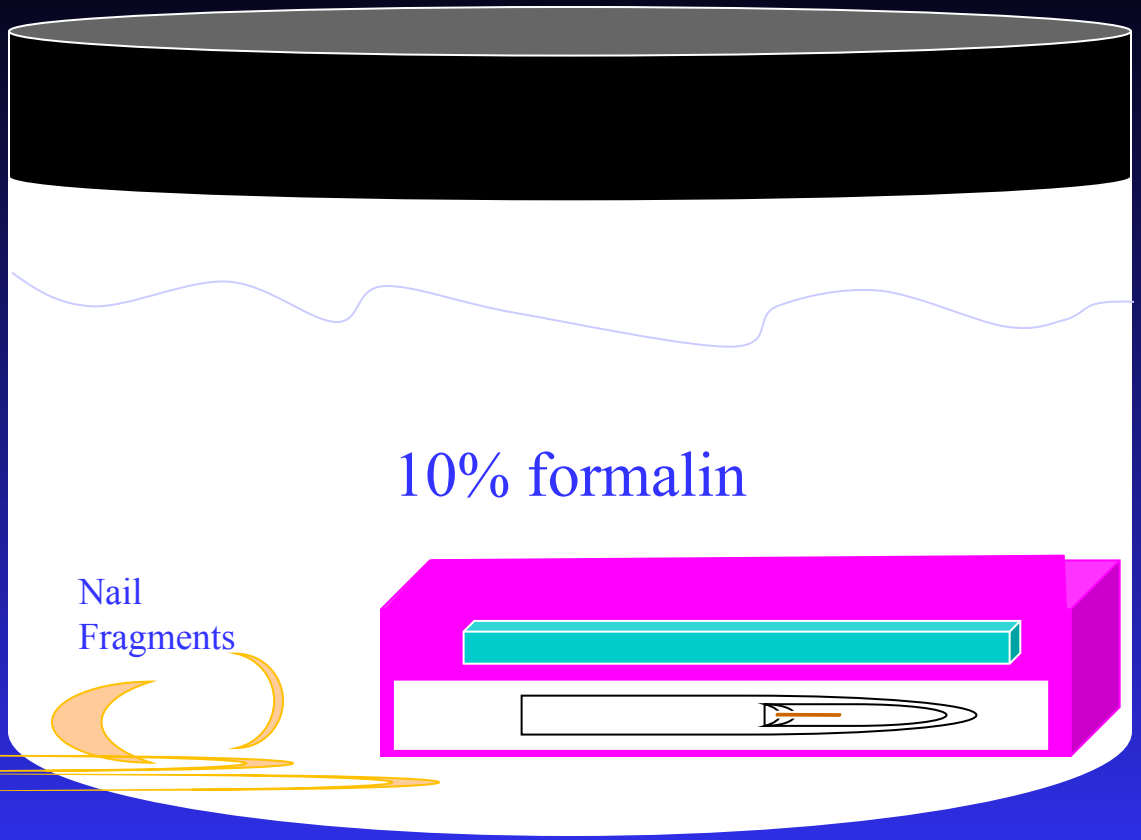

Each specimen is different

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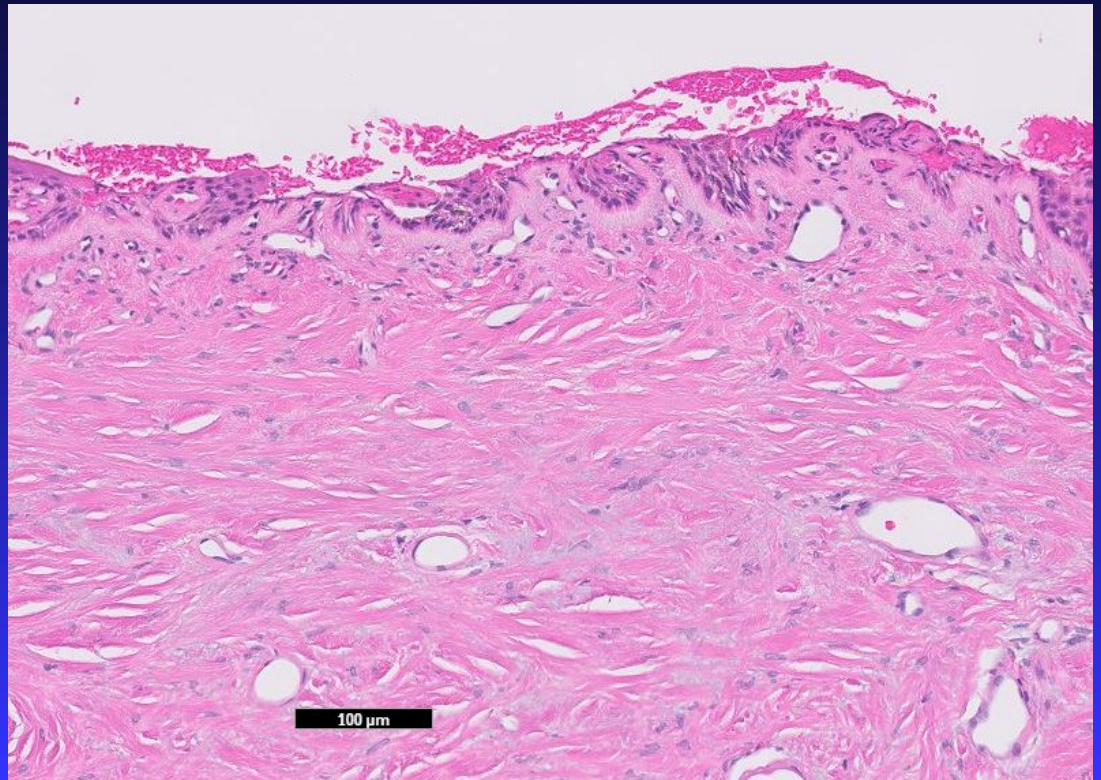
Pathologist review before grossing

- Number tissue blocks
- Unstained slides or levels at the start
- Special stains
- Importance of nail
- Reserve nail for fungal testing

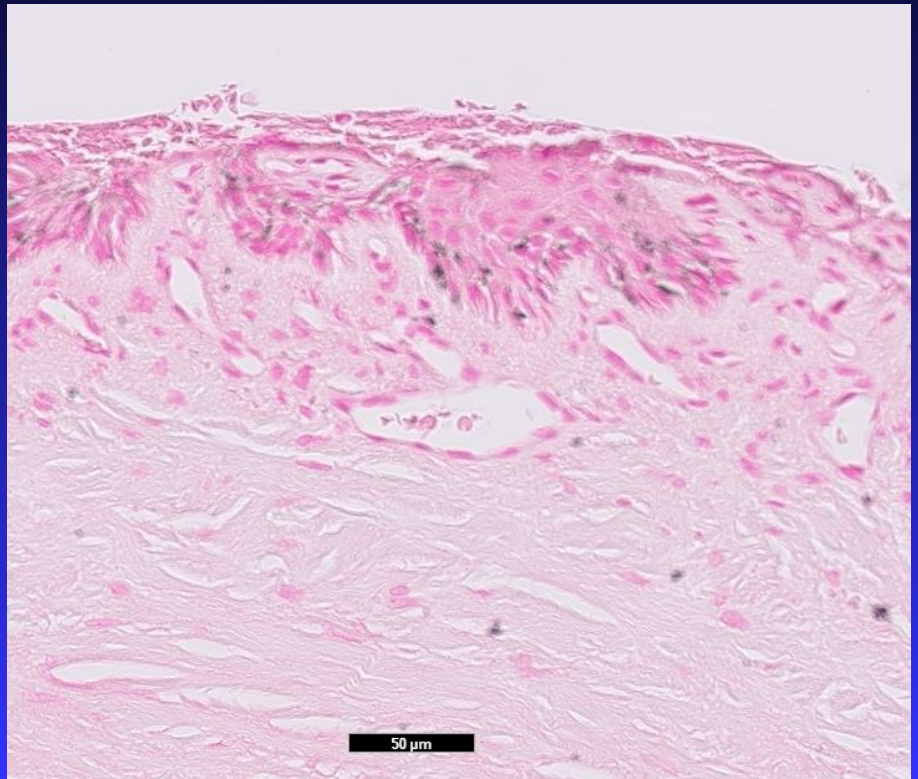
Finding the pigment

- H&E with initial levels
- MelanA IHC
- Fontana-Masson
- PAS fungus
- Unstained slides

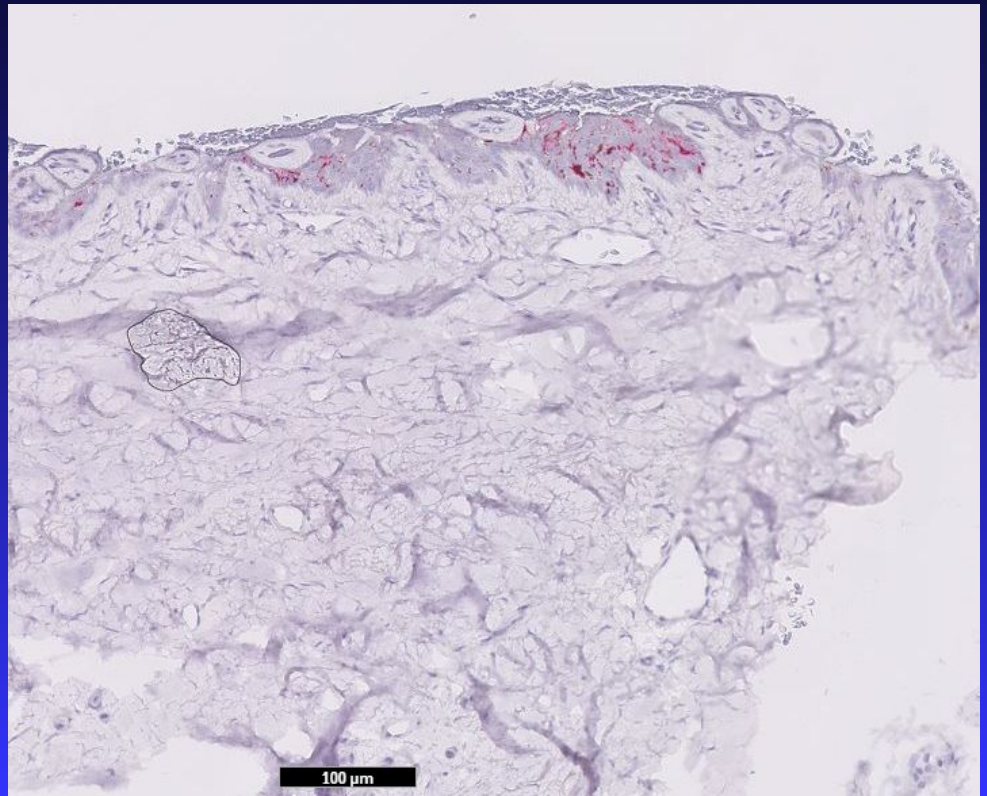
Finding the pigment
H&E levels



Finding the pigment
Melanin stain (Fontana-Masson)



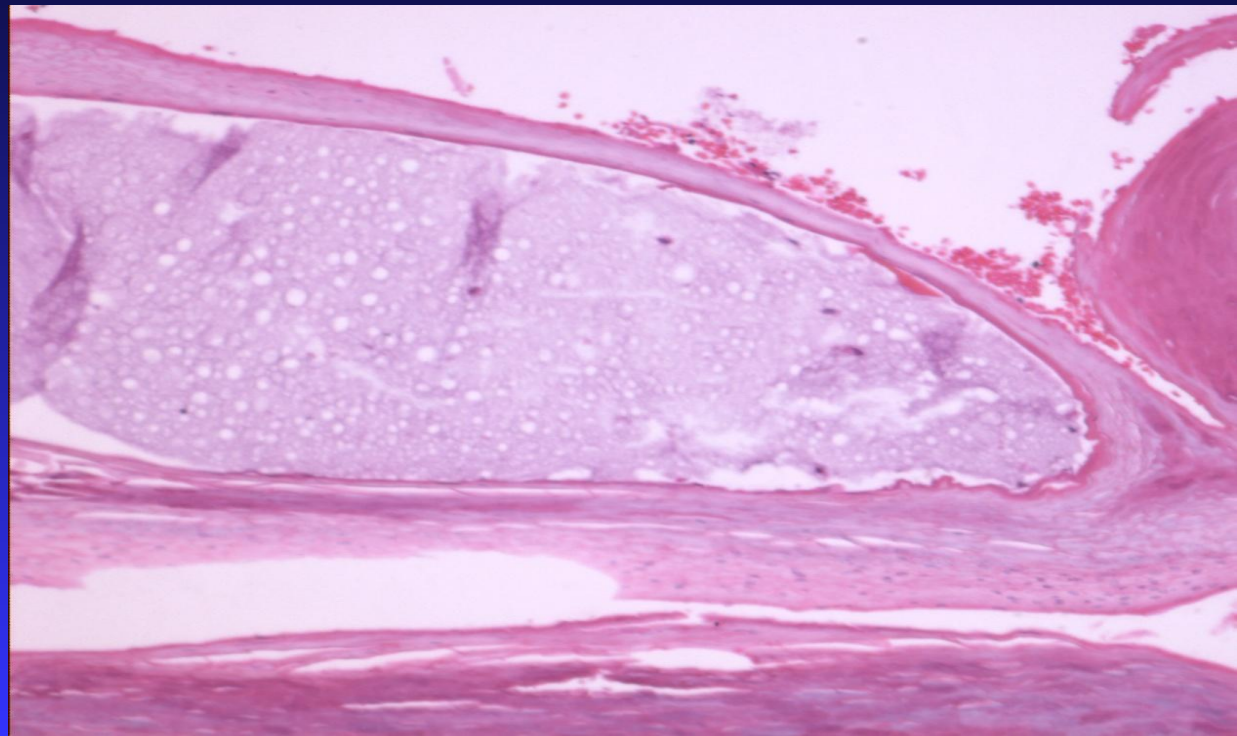
Finding the pigment
Melanocyte market (melanA/Mart1



Digital Myxoid/Mucous Cyst

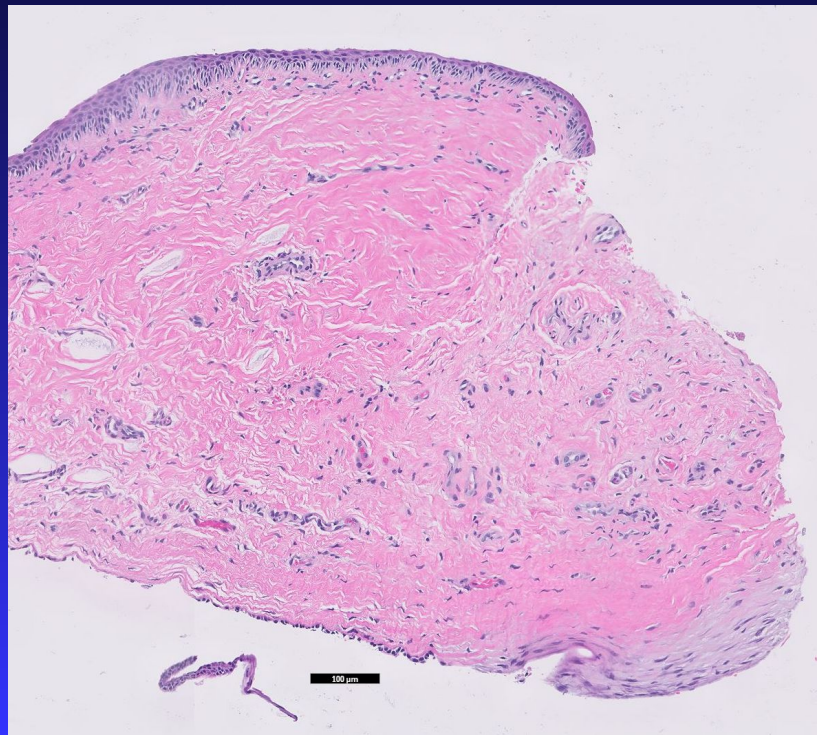
Digital Myxoid/Mucous Cyst

- Mucin may be anywhere

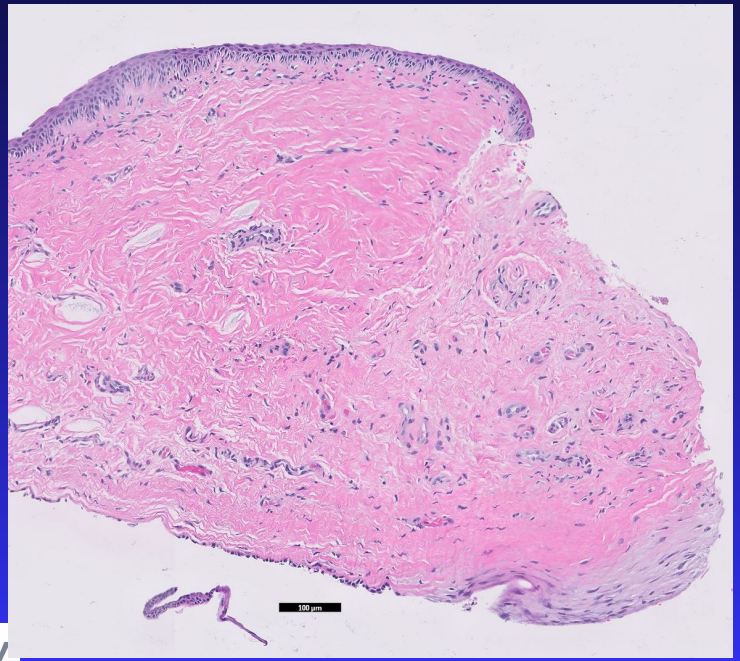


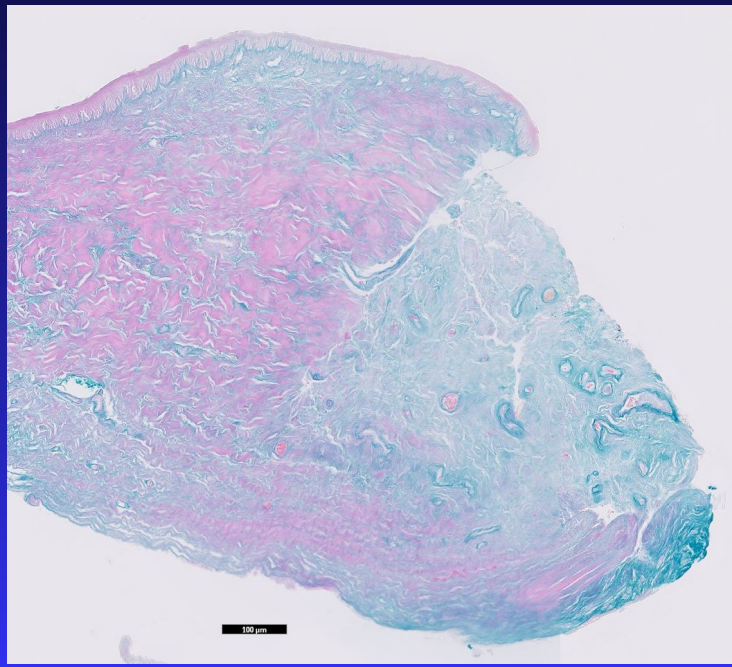
Digital Myxoid Cyst

- Often don’t see mucin
  - Scar
  - Reactive changes



Mucin stain often required





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Nail Fungus Diagnostics

- Sampling an issue

Submit specimen dry in an envelope

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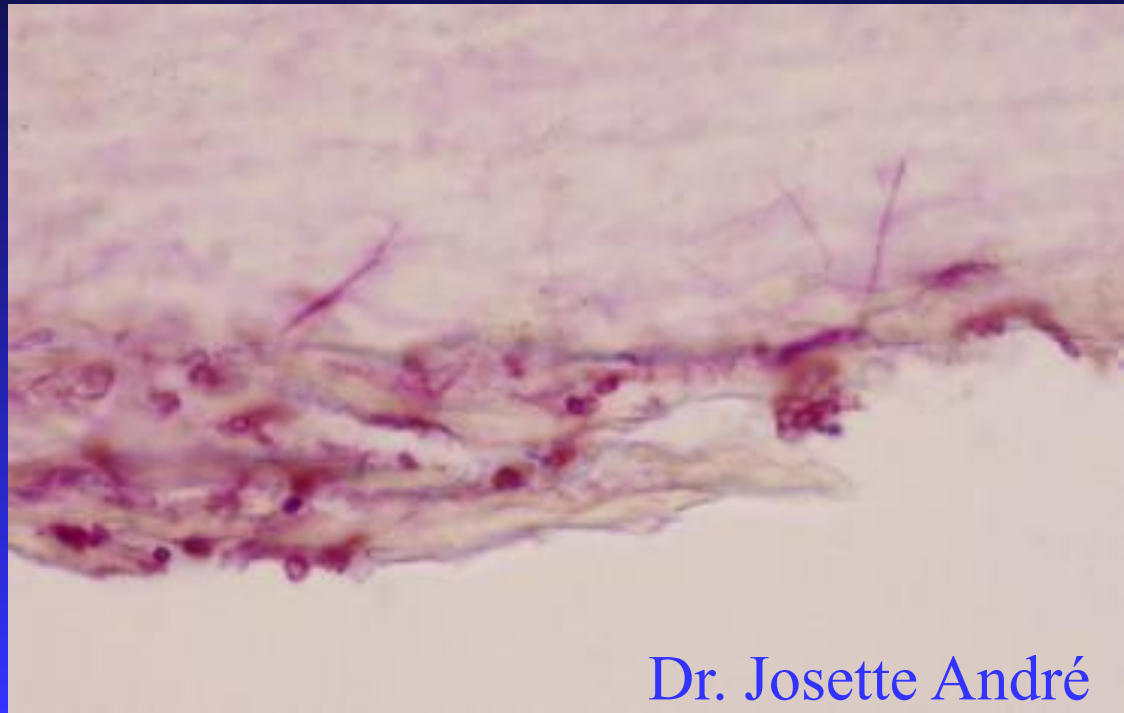
Mold

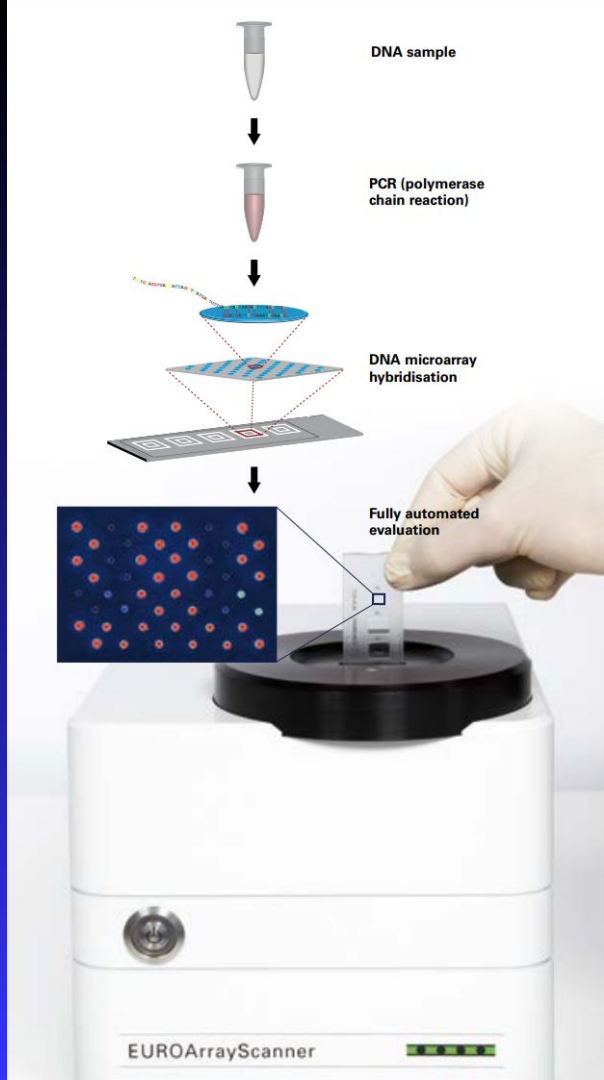
Mold vs Dermatophyte

- Invades vertical to nail plate.



Dr. Josette André

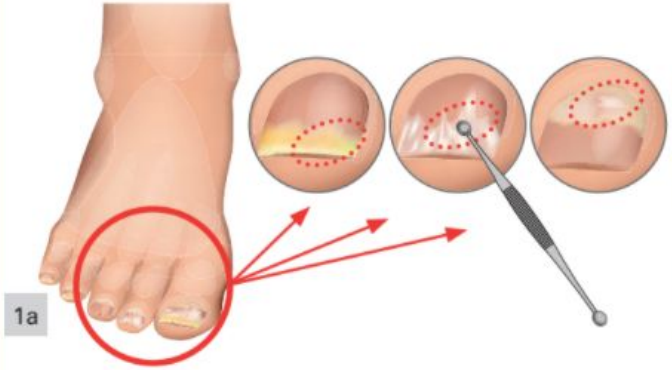
PCR replacing culture

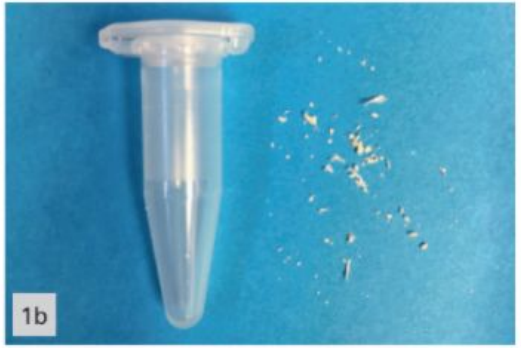


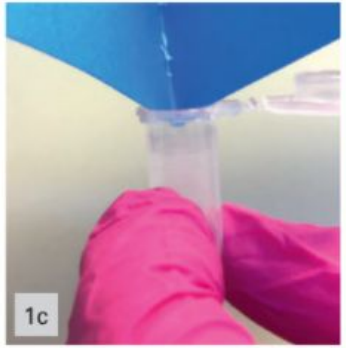
PCR Sample collection

- Remove any nail varnish
- Clean area 70% ethanol and let dry briefly

PCR Sample collection

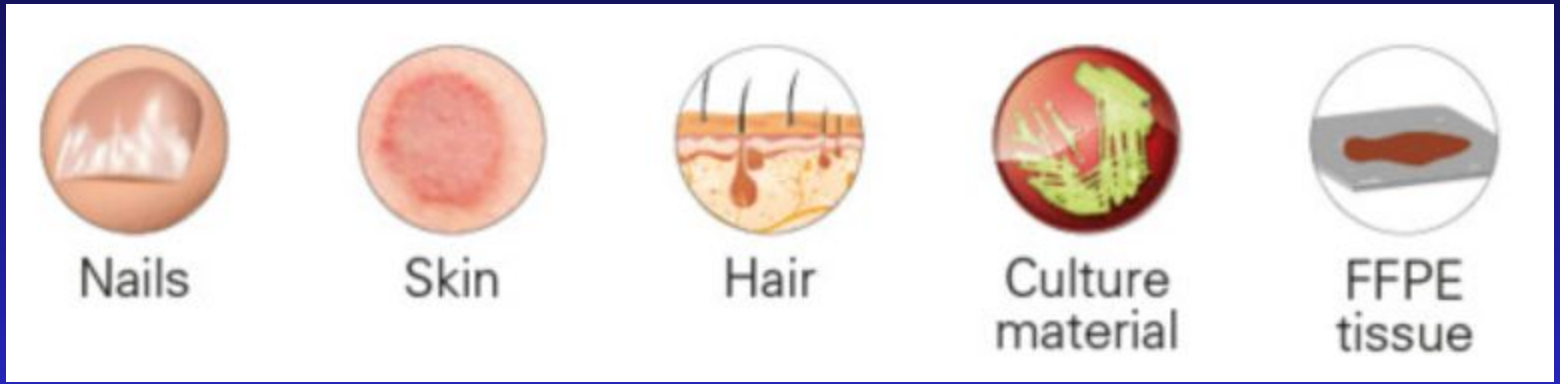






- Before collection, remove any traces of nail varnish.
- Take samples from nail areas with visible damage or staining (see Fig. 1a). Include any crumbly or soft material under the nail plate. If several nails are affected, take a pooled sample from all of them.
- Plane off sample material from the nail surface down to the deeper layers using a sterile, blunt (if required) scalpel, a sharp spoon, a ring curette or a milling tool. Retrieve any soft/crumbly material from under the nail using a small hook.
- Preferably, collect nail shavings or small pieces of the nail, not entire nails (see Fig. 1b).

PCR Sample collection



PCR replacing culture

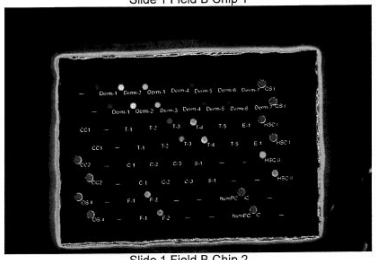
Patient ID : CT20-27456

Protocol : 1/6/21 AL

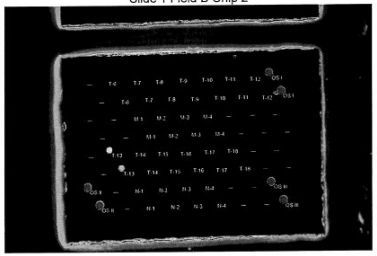
Page : 1

Partial result	Result
Cross contamination control	valid
Internal Control	valid
DNA positive control	**not detected**
Hybridisation specificity control	valid
Dermatophyte (universal)	**DETECTED**
Trichophyton equinum	not detected
Trichophyton tonsurans	not detected
Trichophyton interdigitale	**DETECTED**
Trichophyton mentagrophytes	not detected
T. interdigitale/mentagrophytes	not detected
Trichophyton quinckeanum	not detected
Trichophyton schoenleinii	not detected
Trichophyton simii	not detected
T. quinckeanum/schoenleinii/simii	**DETECTED**
Trichophyton benhamiae(white/afr.)	not detected
Trichophyton benhamiae (yellow)	not detected
T. bullosum/benhamiae (afr.)	not detected
T. concentricum/erinacei	not detected
Trichophyton erinacei	not detected
T. verrucosum/eriotrephon	not detected
Trichophyton rubrum	**DETECTED**
Trichophyton violaceum	not detected
Epidermophyton floccosum	not detected
Nannizzia fulva	not detected
Nannizzia gypsea	not detected
Nannizzia incurvata	not detected
Nannizzia persicolor	not detected
Microsporum canis	not detected
Microsporum ferrugineum	not detected
Microsporum audouinii	not detected
M. canis/audouinii	not detected
Candida parapsilosis	not detected
Candida guilliermondii	not detected
Candida albicans	not detected
Fusarium solani	**DETECTED**
Fusarium oxysporum	not detected
Scopulariopsis brevicaulis	not detected

Slide 1 Field B Chip 1



Slide 1 Field B Chip 2



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PCR replacing culture

Patient ID : CT20-27456

Test result	Result
Dermatophyte	**Multiple infection**
Yeast/Mould	**Fusarium solani**

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Patient ID : CT20-27456 **Protocol :** 1/6/21 AL
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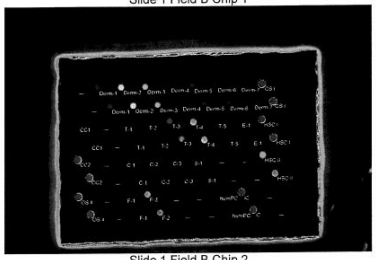

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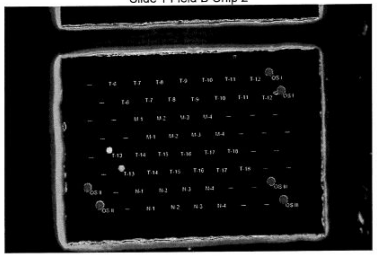

Reimbursement for PCR testing

PCR Experience to date

- Works well after PAS (formalin fixed)
- Correlates with PAS but some PAS negative are positive with PCR
- Co-infection common
- Insurances cover test

Thanks!

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