The era of technology in skin cancer diagnosis and management

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Conflicts of interest

SPEAKER: Almirall, BMS, ISDIN, La Roche Posay, Leo, Novartis, Pierre Fabre, Roche, Sanofi

HONORARIA OR CONSULTATIONS FEES : Almirall, BMS, Biofrontera, GSK, ISDIN, La Roche Posay, Leo, Novartis, Polychem

GRANTS & RESEARCH SUPPORT: Almirall, Amgen, BMS, Biofrontera, Canfield, Cantabria, Fotofinder,

GSK, ISDIN, La Roche Posay, Leo, Mavig, Nevisense, Novartis, Polychem, Roche,iTOBOs (EU Grant)

Spouse/partner: Almirall, Amgen, BMS, Biofrontera, Canfield, Cantabria, Fotofinder, GSK, ISDIN, La Roche Posay, Leo, Mavig, Nevisense, Novartis, Pierre Fabre, Polychem, Roche

Other support (please specify): Abbie (educational activities), Lilly (educational activities), Novartis

Co-founder of Diagnosis Dermatologica sl and Athena Tech, Investor of Dermavision

ATHENA TECH

DIAGNOSIS DERMATOLOGICA

Clínic Barcelona

iTOBOS

MELCAYA

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IDIBAPS Institut D'Investigacions Biomèdiques August Pi i Sunyer

ATHENA TECH

Fundació La Marató de TV3

Universitat de Girona

ViCOROB Computer Vision and Robotics

iToBOS

Skin Cancer Center in the Hospital Clinic of Barcelona

University Hospital Clinic of Barcelona

University of Barcelona

CEK. IDIBAPS. Fundació Clínic

Hospital Clínic de Barcelona

Fundació de Recerca Clínic Barcelona-Institut d'Investigacions Biomèdiques August Pi i Sunyer

CERCA center (Instituto Carlos III)
Science Foundation center Association (AECC)
Biosanitary Clinical Research Management Institutions (REGIC)
Esther Koplowitz Center (CEK) 2,500 m^2 + CELLEX 2,000 m^2

+3.9k	+362	+225.7k	+10k	+3.4k	+341
investigadors	entitats	publicacions	projectes i contractes	tesis	propietat industrial i intel·lectual

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Melanoma: imaging, genetics and immunology

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Dermoscopy, digital dermoscopy, confocal microscopy and new photonic and physic technologies

Genetic epidemiology in melanoma and non-melanoma skin cancer

Evaluation of immune response in melanoma

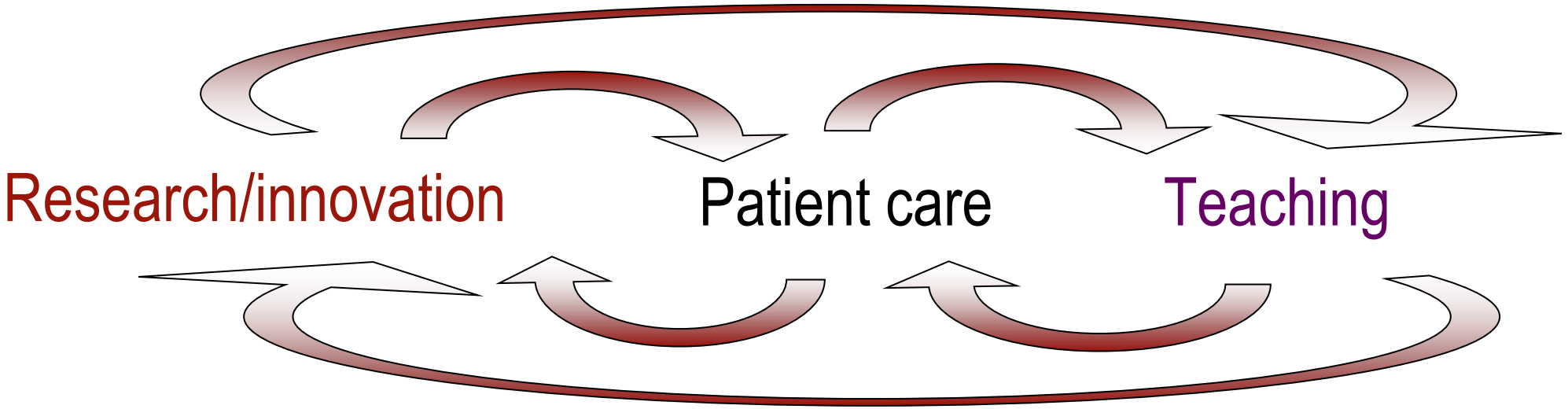
Giant congenital nevi

Identification of genetic prognostic profiles in melanoma

Study of the mechanisms involved in carcinogenesis and photocarcinogenesis in melanoma and non-melanoma skin cancer

The Mission

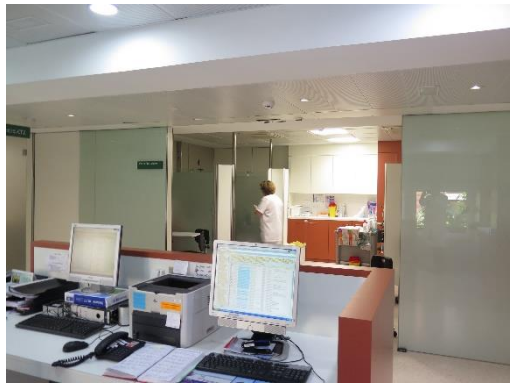
Skin Cancer Center



Quality assurance

The Skin Cancer Centre

- **Modern inpatient, ambulatory care and laboratory facilities** necessary for the overall educational program for the different skin cancers
- **Dermatopathology** services
- **Modern diagnostic radiology** services,
- Resources for **nuclear medicine imaging**
- **Blood banking**, blood therapy facilities, facilities for **clinical pharmacology** and **tumour immunology/biology**.
- An advanced **oncology service (surgical, medical and radiotherapy)**.
- A set-up for regular **multidisciplinary tumour conferences**
- Set up for **clinical trials on Good Clinical Practice base**

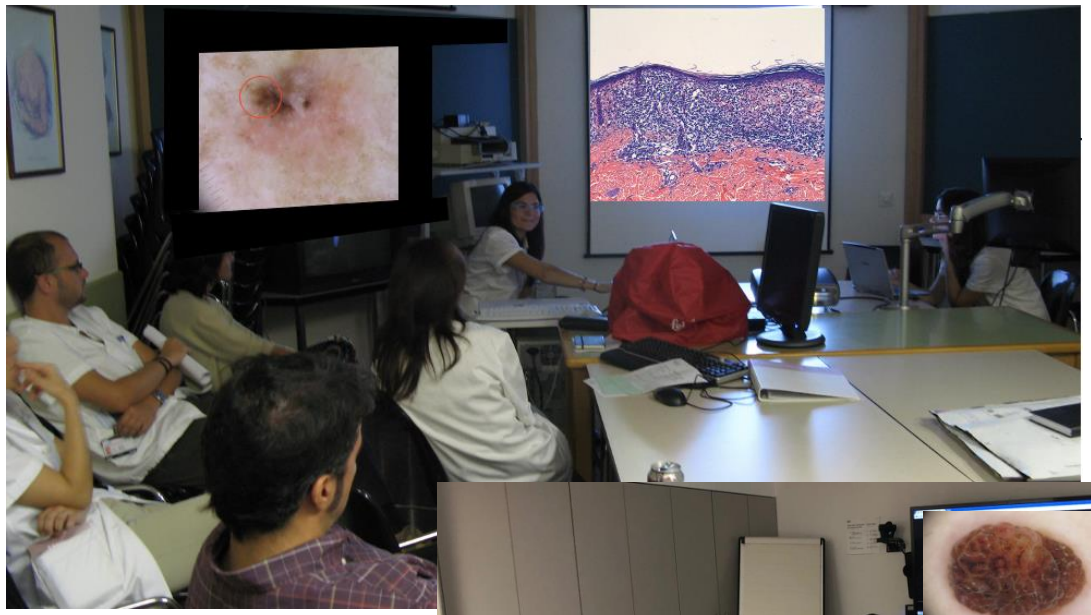


Hospital Clínic de Barcelona

IDIBAPS y Fundación Clínic

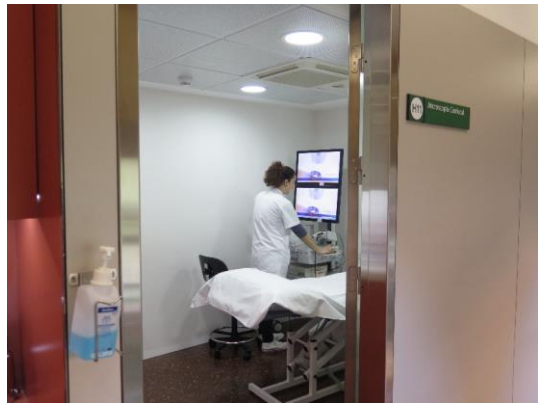
Patients

- Patients atended yearly = 3,500
- Visits = 12,500 year
- New melanoma patients = 300 pts/yr
- Pts with systemic therapies = 200/ yr
- Complex Surgeries = 1500-1600 yr
- Clinical trials (ongoing) = 20-25



Diagnostic of skin cancer

Diagnostic technologies
3D body scanner (Vectra 360)
In vivo RCM (V1500, V3000); LC-OCT/OCT; US and ex-vivo CM microscopy (V2500)



1200 examinations of complex tumors per year
Fast Mohs surgery (550 patients/year)

Pigmented lesions Clinic (1980)

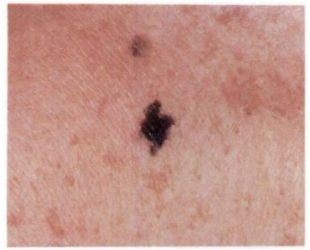
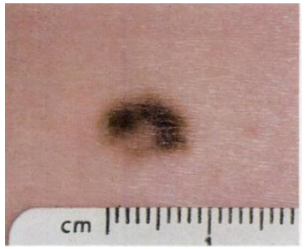
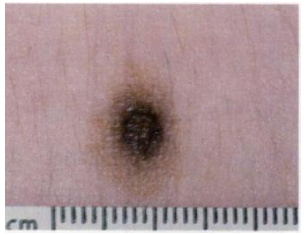


Fig. 18. Early malignant melanoma, approximately six mm in diameter.

Fig. 19. Early malignant melanoma, approximately eight mm in diameter.



ig. 25. Dysplastic nevus measuring nine mm diameter.



ig. 26. Dysplastic nevus with features of a lark-target variant

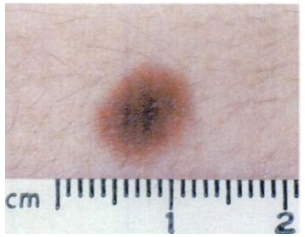


Fig. 12. Border irregularity of early malignant melanoma.

Fig. 13. Border irregularity of early malignant melanoma.

remembered by thinking of ABCD:
- A = Asymmetry.
- B = Border irregularity.
- C = Color variegation.
- D = Diameter generally greater than six mm.

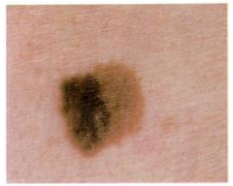


Fig. 15. Color variegation of early malignant melanoma.

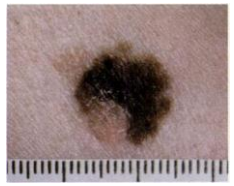


Fig. 16. Color variegation of malignant melanoma. Note the pink-red component at lower margin of lesion.

Fig. 22. Progression of malignant melanoma: plaque with nodule.

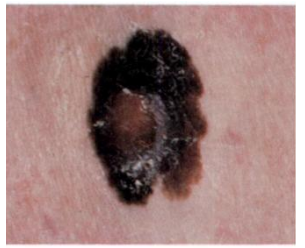


Fig. 23. Progression of malignant melanoma plaque with amelanotic nodule.

Friedman RJ
Rigel DS
Kopf AW
Cancer
Journal 1986

Diagnostic of Skin Cancer: Technology

- Laboratory vs Patient (Medical Devices)
- In vivo vs ex-vivo
- Natural contrast or artifical contrast
- Imaging vs Quantitative

Qualitative methods (images)

Total Body Scanners/ Dermoscopy
Optical Coherence tomography (OCT)
Confocal Microscopy (CM)
LC-OCT

Quantitaive

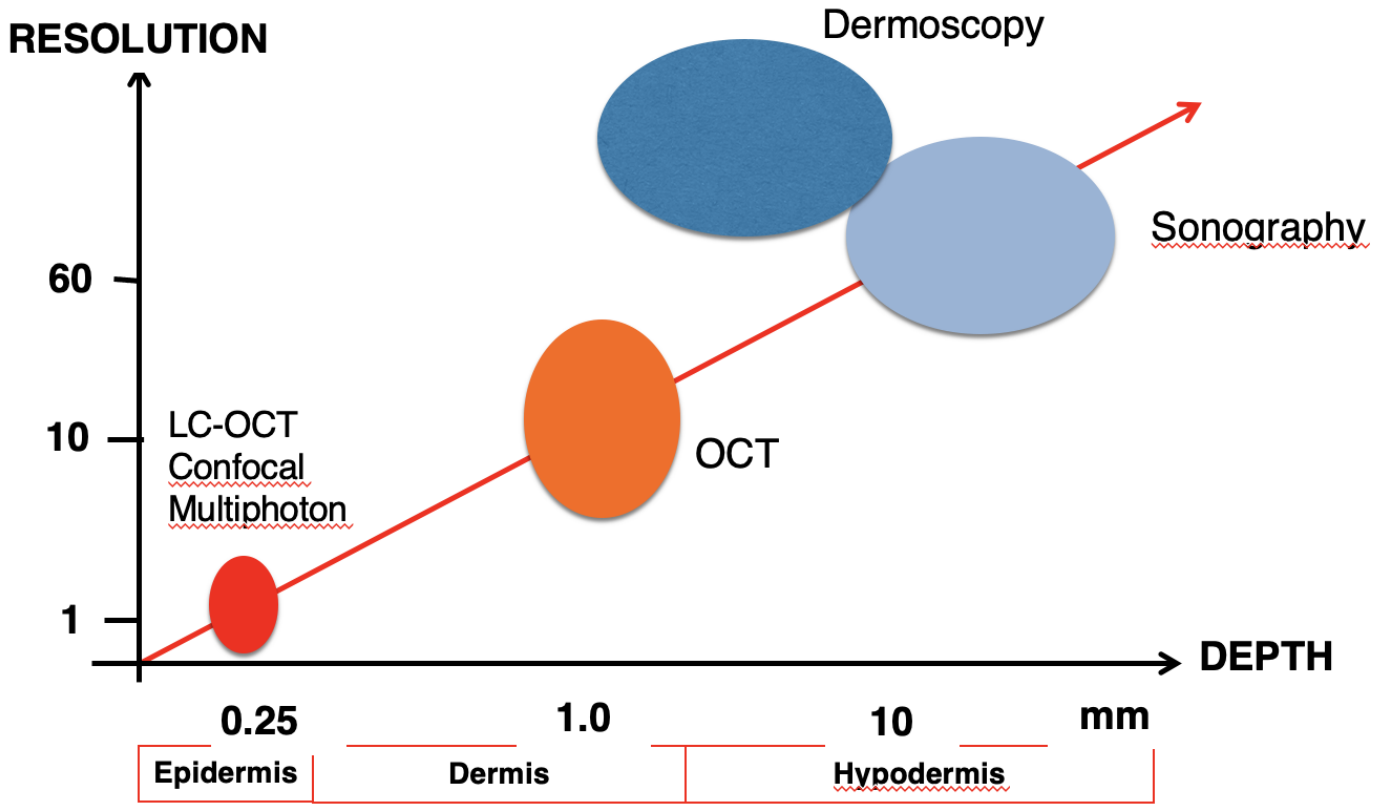
Impedanciometry
Multispectral analyses
RAMAN

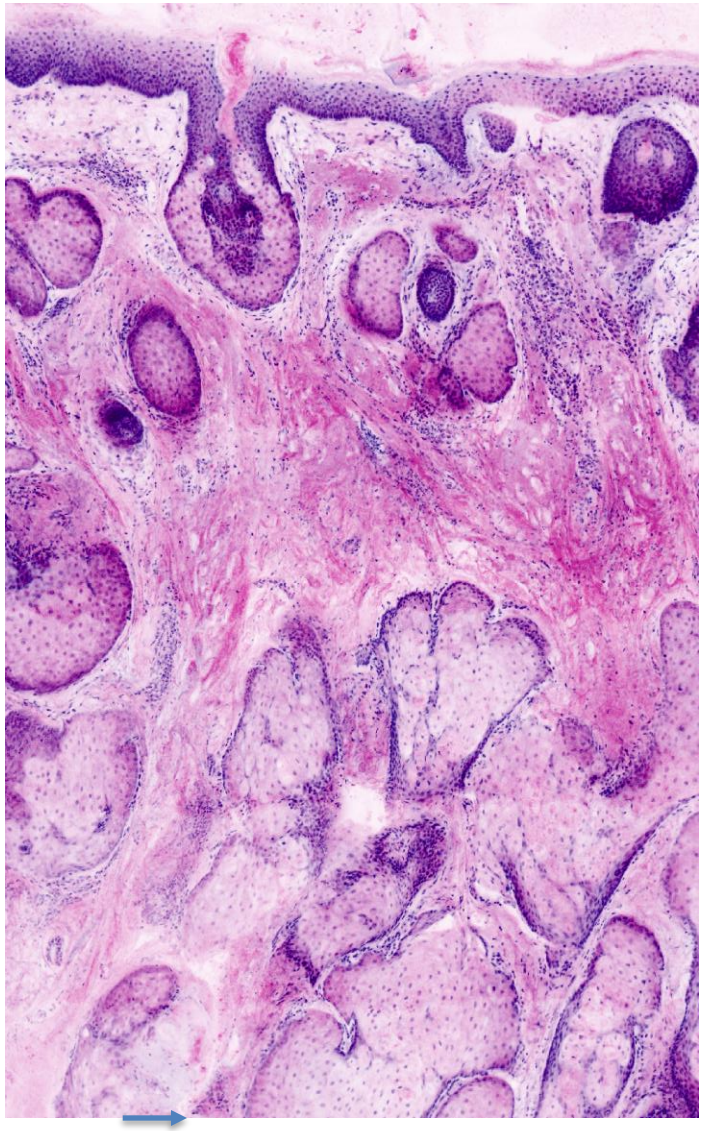
Diagnostic of Skin Cancer: Technology

Preclinical development	Enginering, laboratory
CE marked approval	Start-up, clinical studies, regulatory
Clinical adoption	Vendors, education, reimbursement

10 yrs

Tissue properties and photonics



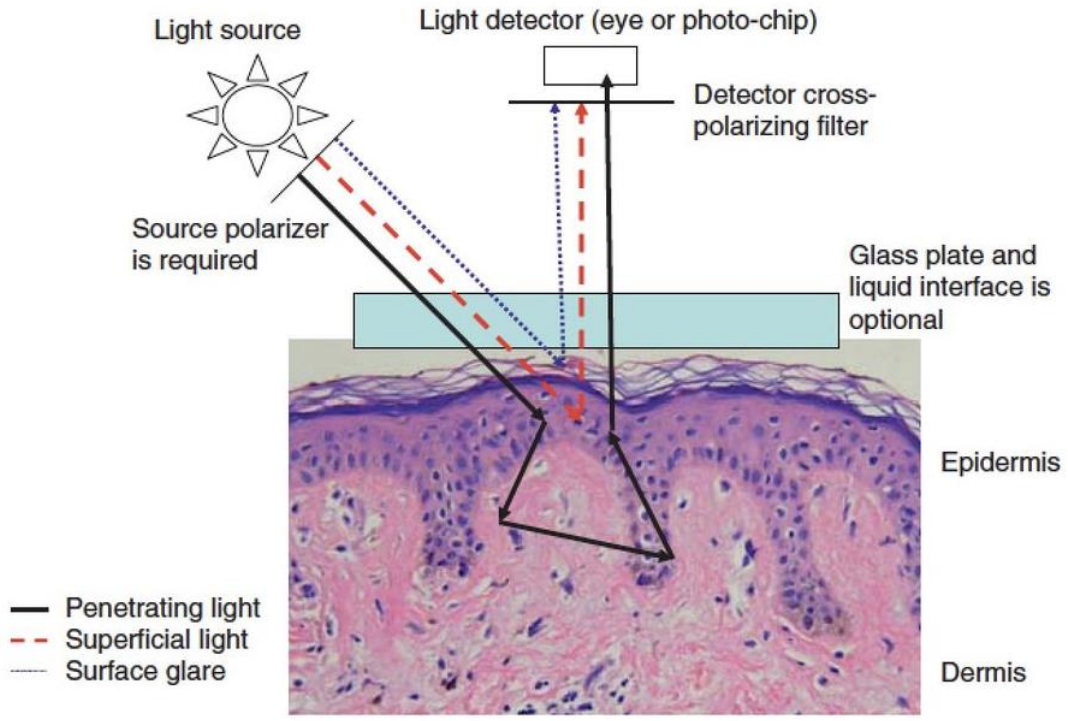


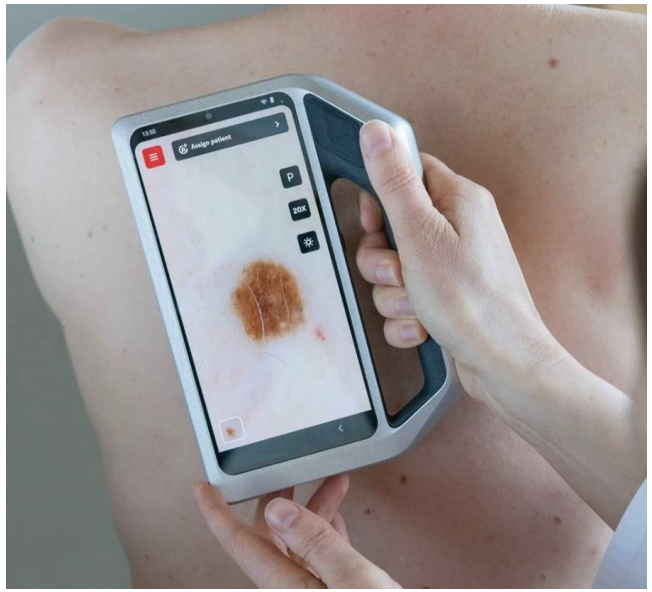
0.30 mm

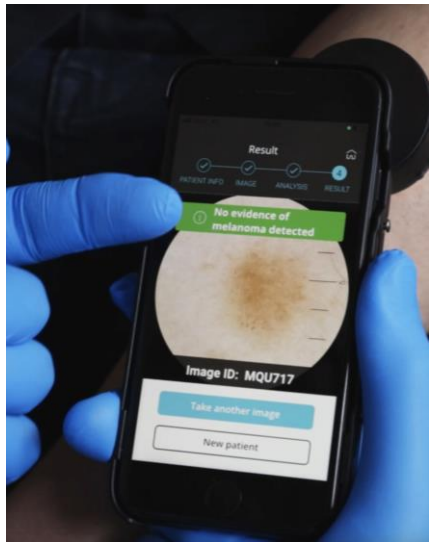
1 mm

3 mm

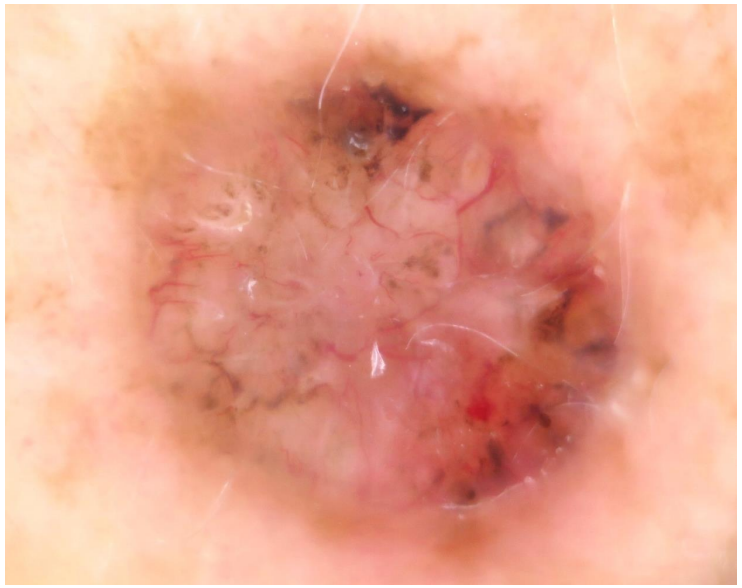
Dermatoscopes







Dermoscopes contain light-emitting diodes to provide illumination and are equipped with a magnification lens. However, PDs use two polarized filters to achieve **cross-polarization**



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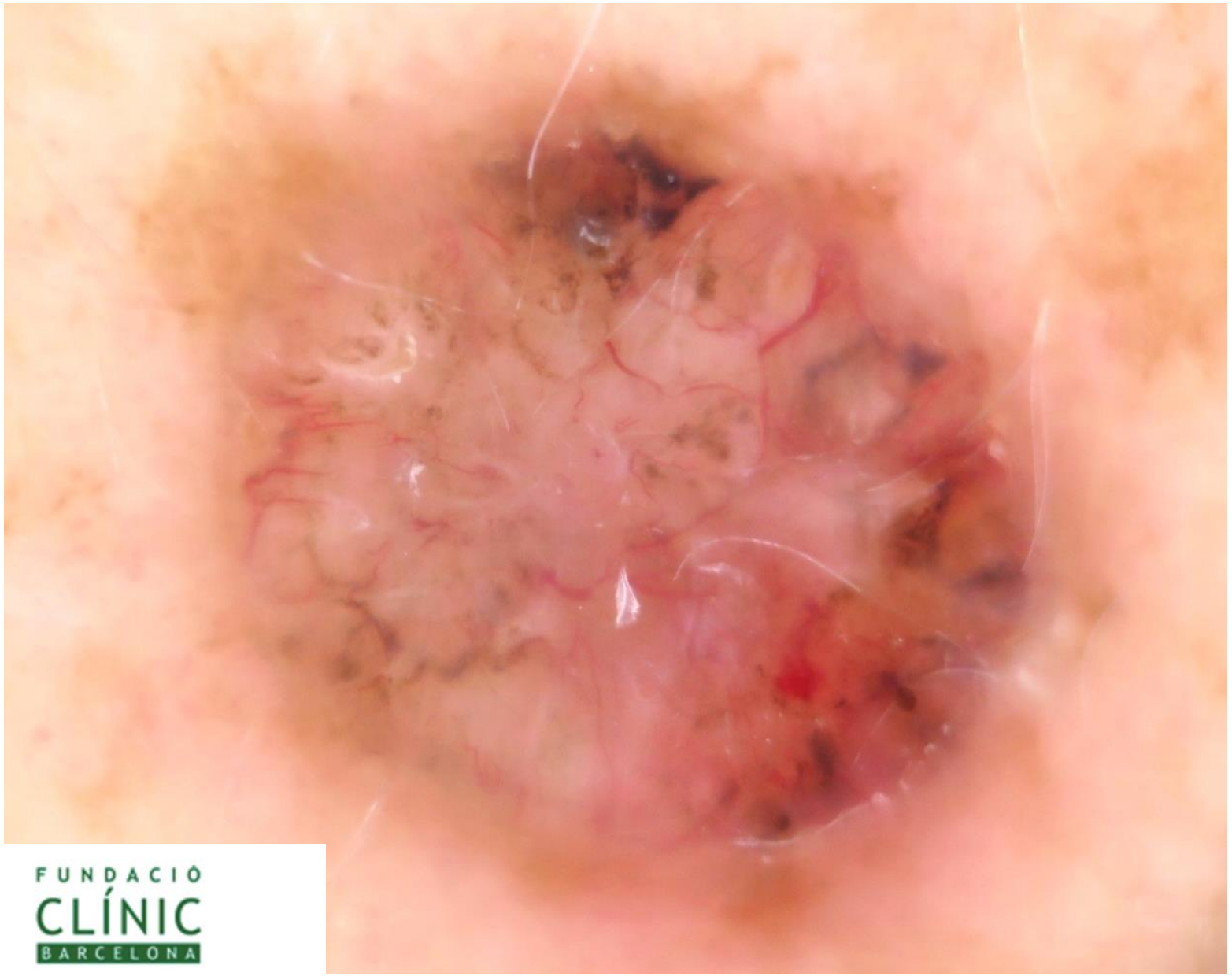

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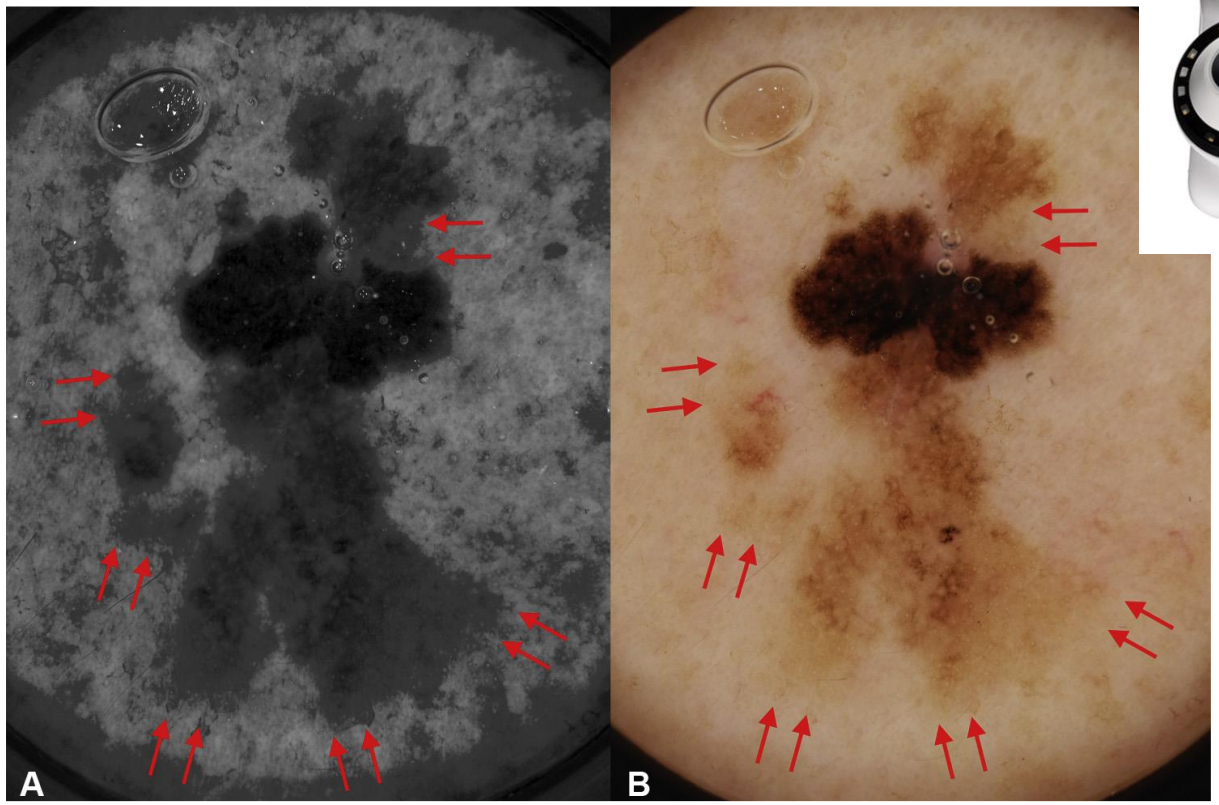
UV light dermoscopy

Dermoscopy with ultraviolet light utilizes the fluorescence emitted by skin lesions:

- Superficial micosis
- nail diseases
- *Demodex* mites
- scabies, and pigmented diseases
- Melanoma demmarcation for complete excision

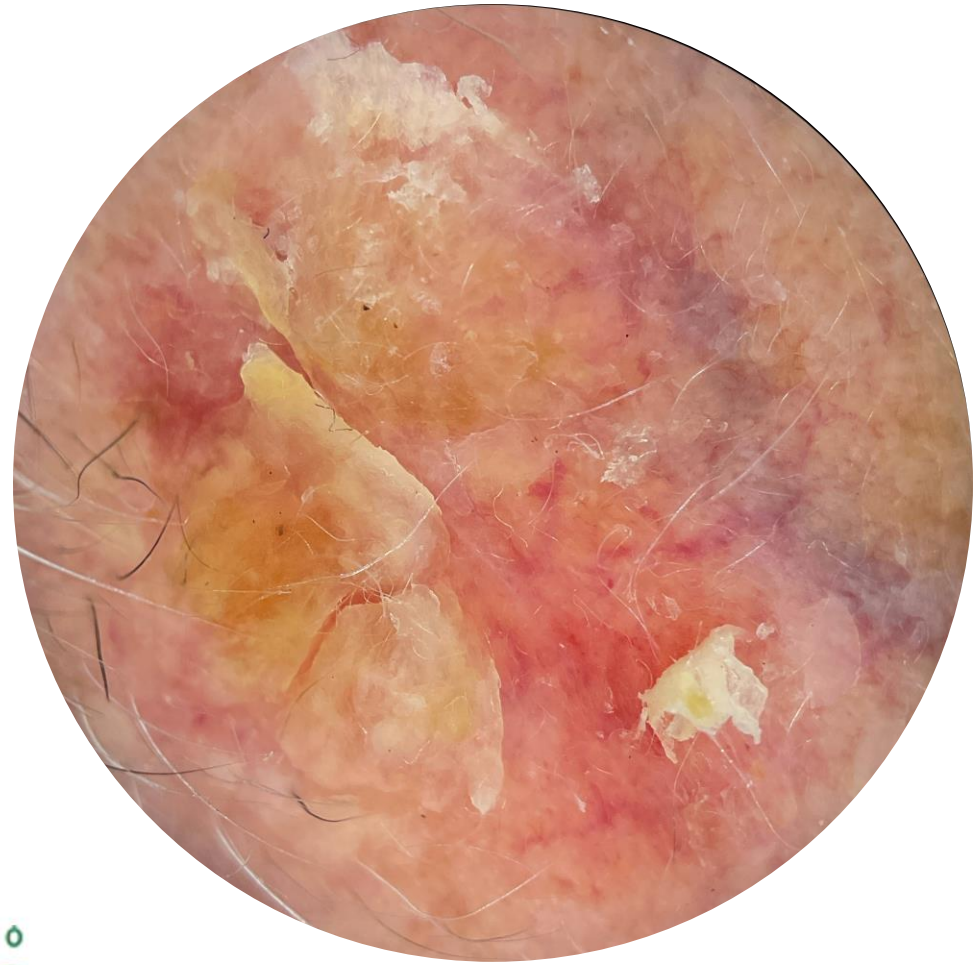


A digital camera integrated dermoscope with a built-in near- UV wavelength (405-nm) light source (DZ-D100 device (Casio Computer Co, Ltd, Tokyo, Japan). It is also more easily accessible than Wood's lamps because eye protection and a darkroom are not required to obtain images.

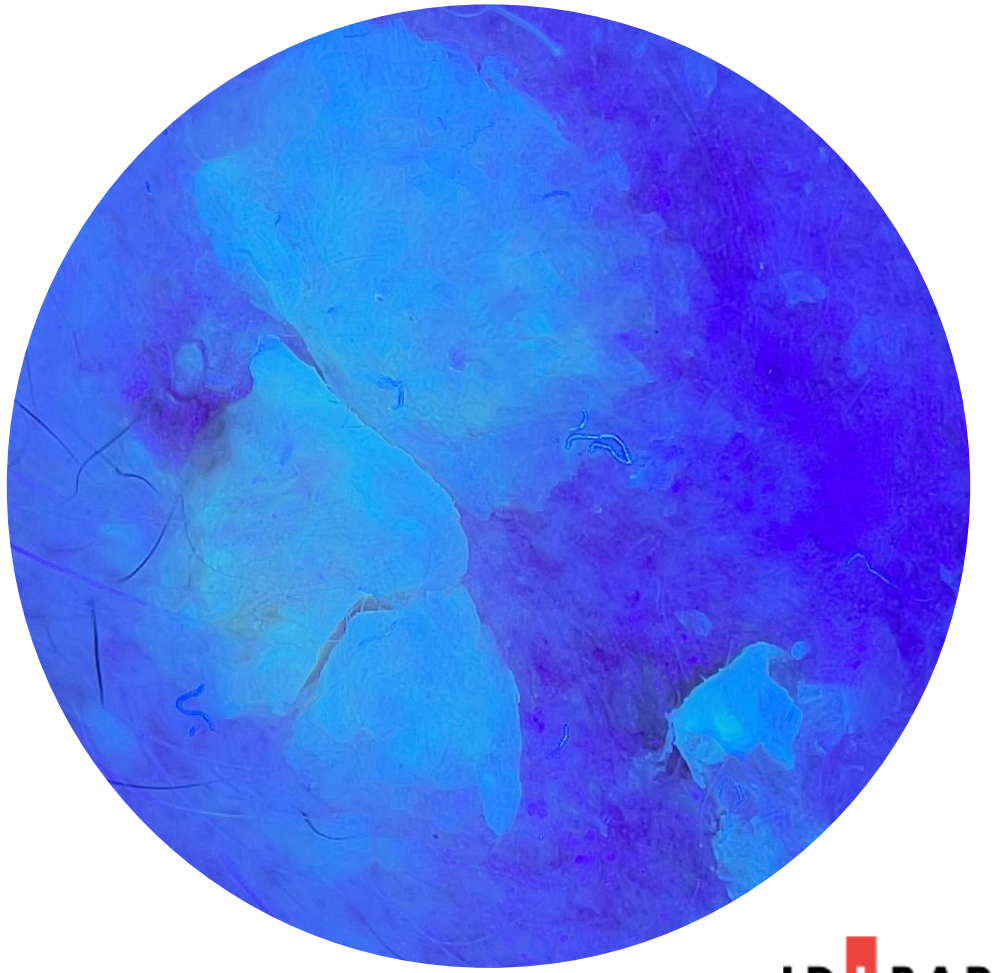
Sano T, Minagawa A, Suzuki R, Koga H, Okuyama R. Dermoscopy with near-ultraviolet light highlights the demarcation of melanin distribution in cutaneous melanoma. J Am Acad Dermatol. 2020;23:S0190-9622(20)32281-7.

Dermoscopy

Cross-Polarized



385 nm



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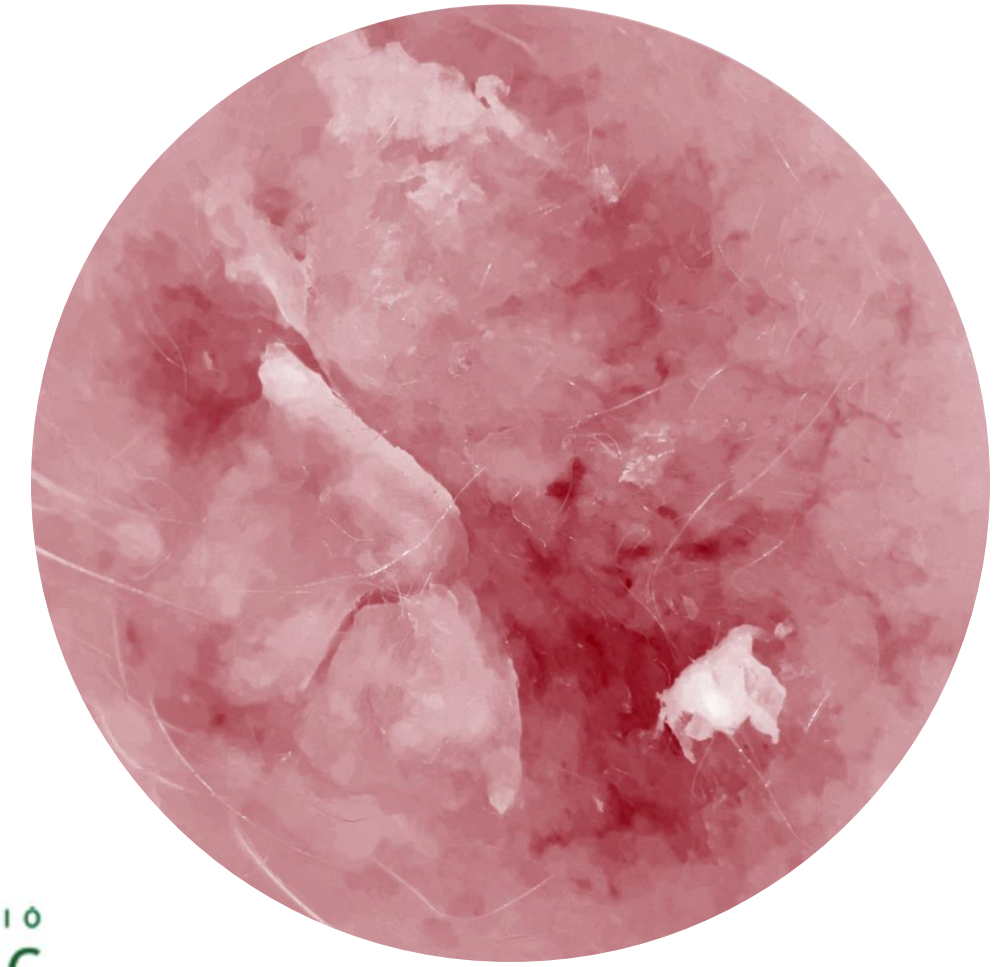
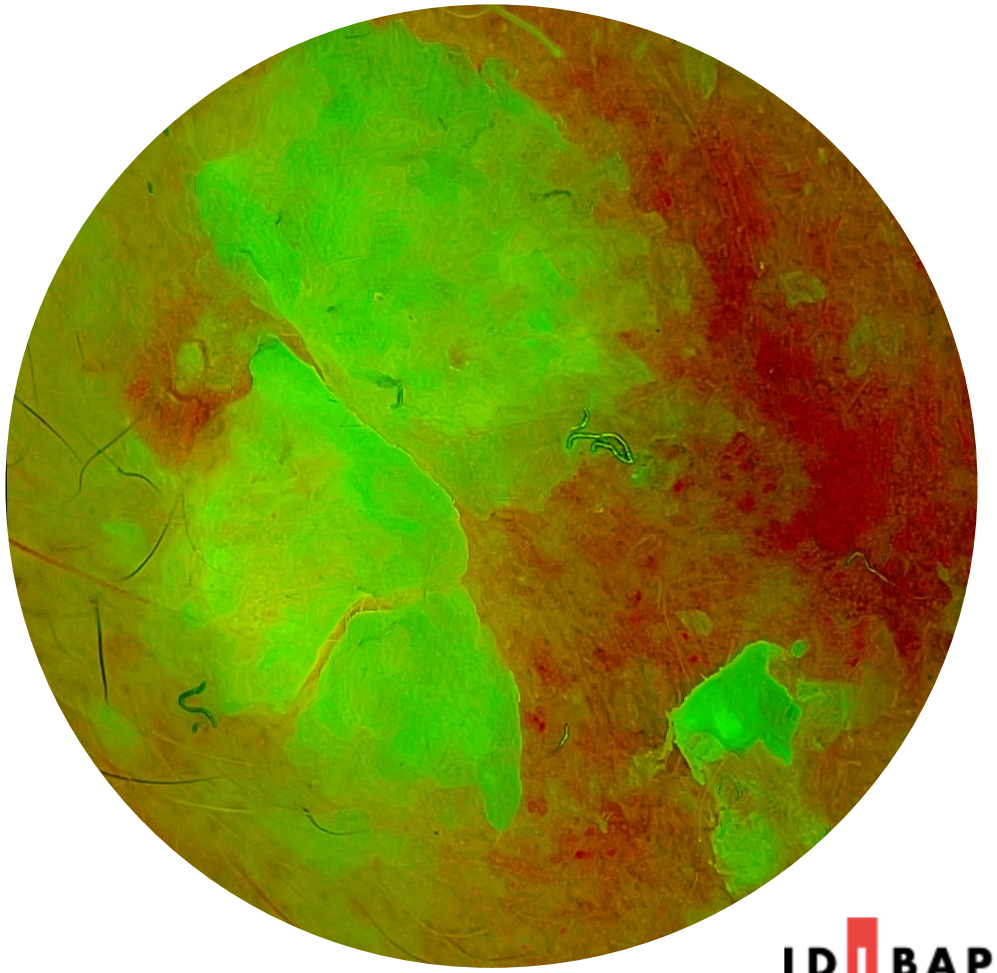
Dermoscopy

RBX-Red



UV-Fluorescence



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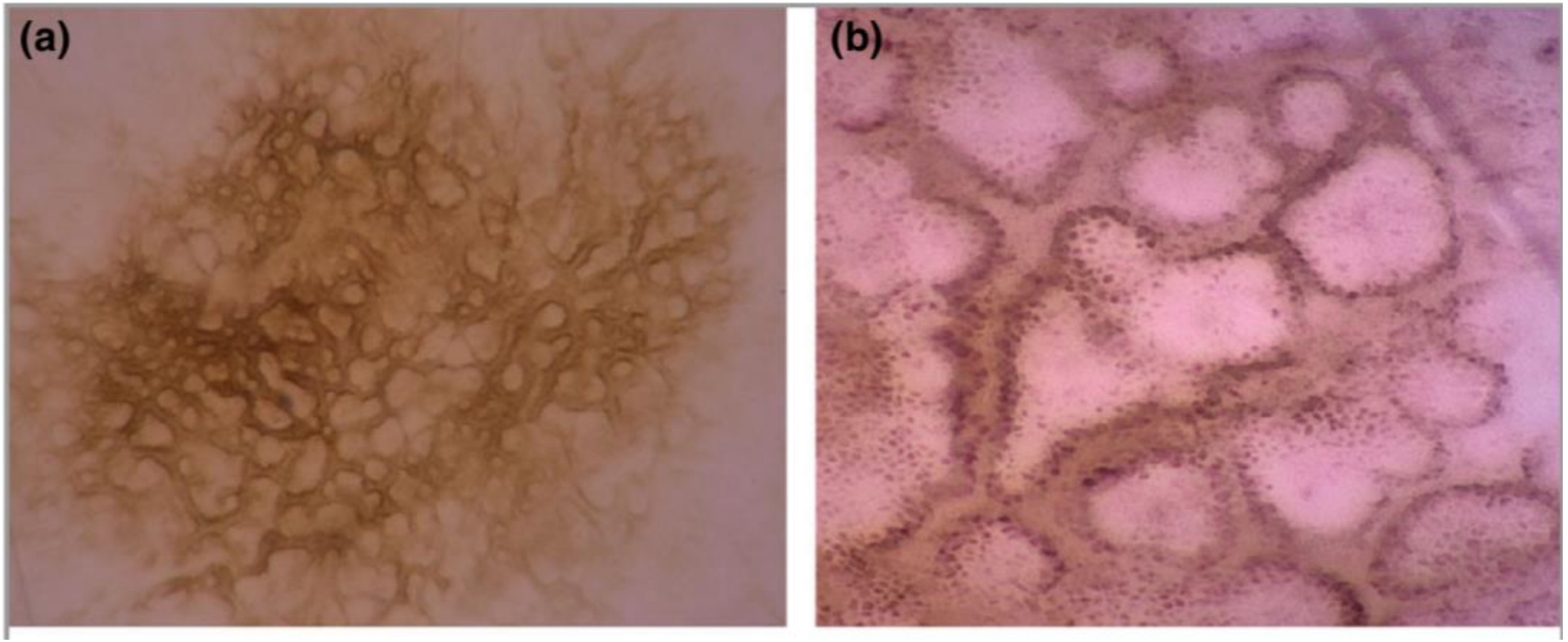
High magnification microscopy of the skin

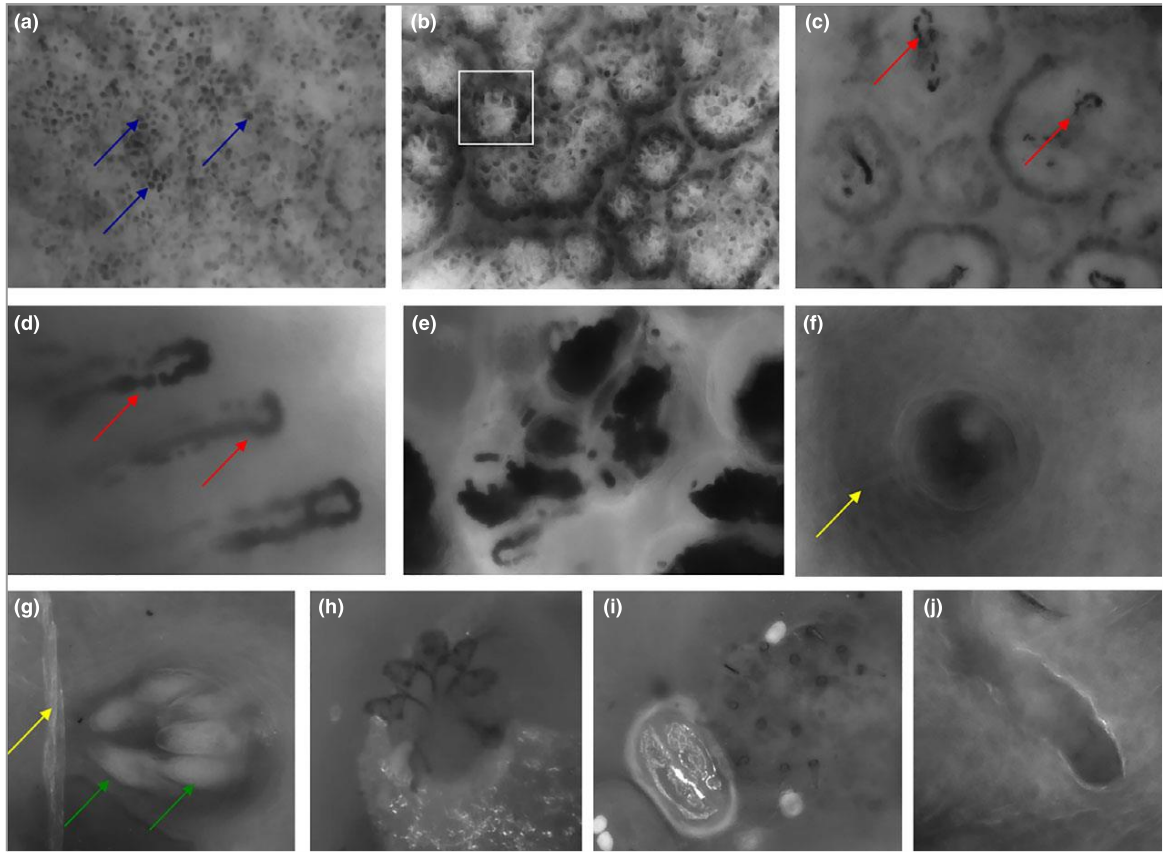
Super-high magnification dermoscopy at 400x magnification (D400)



Dusi D, Rossi R, Simonacci M, Ferrara G. Image Gallery: the new age of dermoscopy: optical super-high magnification. Br J Dermatol. 2018 May;178(5):e330.

FLUORESCENCE-ADVANCED VIDEODERMATOSCOPY

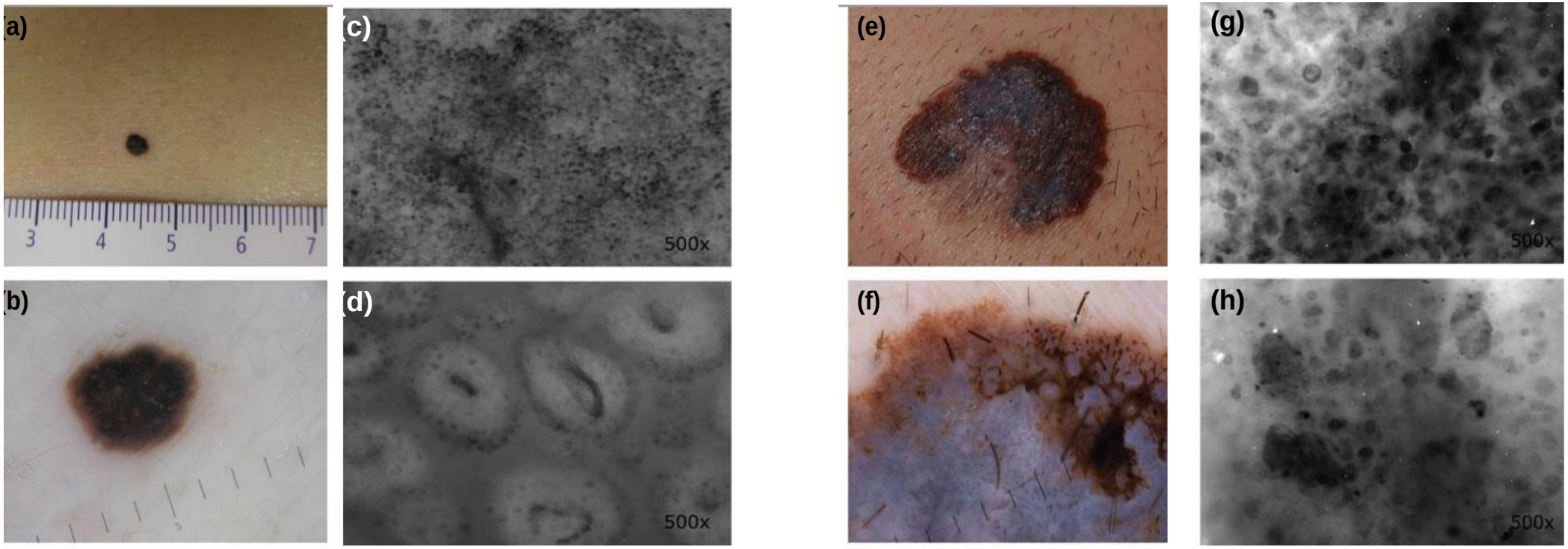
- FAV is an optical electronic system consisting of a handheld probe and a monochromatic light-emitting source with a λ of 405 nm (±5 nm) and a fixed angle of incidence.
- Optical penetration depth varying from 200 µm to 400 µm
- Visualization of subcutaneous structures to the point below the papillary dermis.
- To prevent light diffusion on the corneum stratus, glycerol is applied to the skin surface.
- The working mechanism underlying FAV exists in the ability of endogenous molecules to emit fluorescence after absorbing specific wavelengths.



Sanlorenzo M, Vujic I, De Giorgi V, et al. Fluorescence-advanced videodermatoscopy: a new method for in vivo skin evaluation. Br J Dermatol. 2017;177:e209-e10.

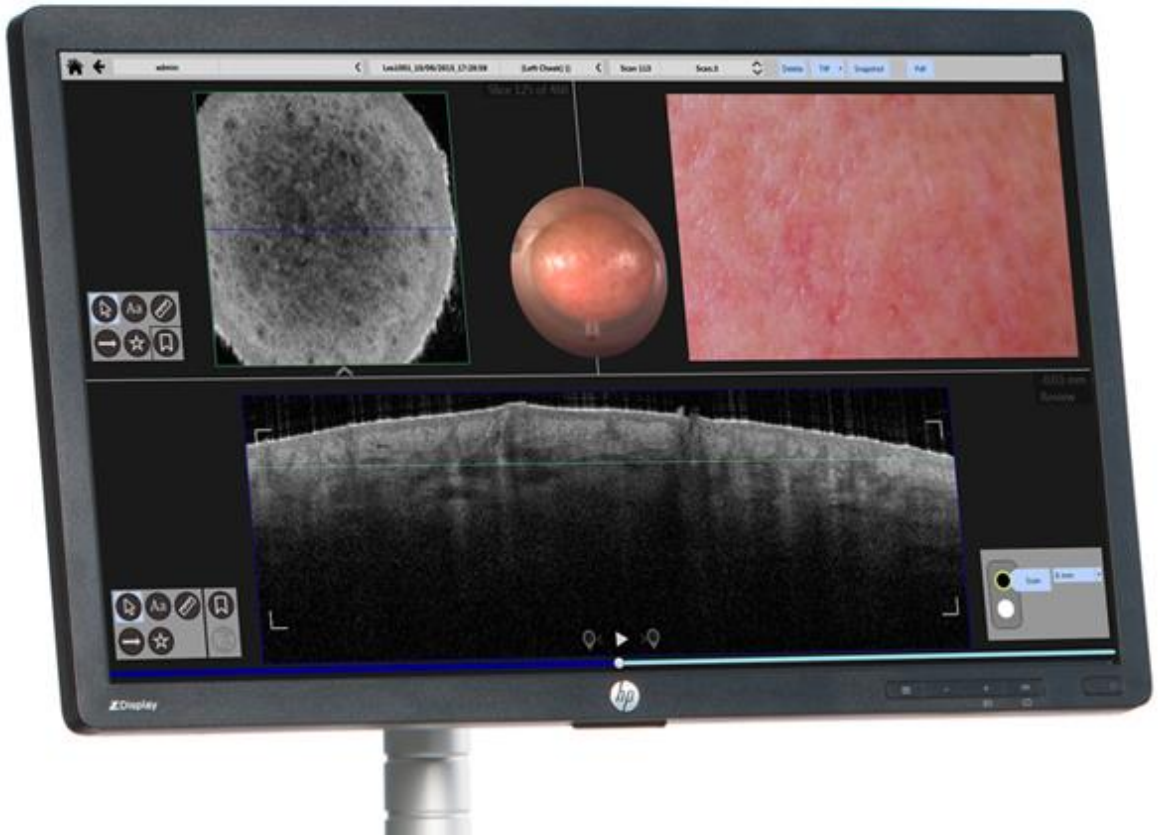
Scarfi F, Gori A, Silvestri F, et al. Fluorescence-advanced videoder- matoscopy: a promising and potential technique for the in vivo evaluation of vitiligo. Dermatol Ther. 2019;32:e12863.

FLUORESCENCE-ADVANCED VIDEODERMATOSCOPY



Scarfi F, Gori A, Topa A, et al. Image Gallery: In vivo fluorescence-advanced videodermatoscopy for the characterization of skin melanocytic pigmented lesions. Pediatr Dermatol. 2019;180:e104.
Cinotti E, Cortonesi G, Rubegni P. High magnification and fluorescence advanced videodermoscopy for hypomelanotic melanoma. Skin Res Technol. 2020;26:766–768.

OCT in Dermatology



- OCT is a noninvasive, in vivo imaging method, which captures high-resolution (µm), 2D or 3D images of biological tissue (6x 6 mm ;2mm depth). Navigation in the skin with clinical image reference. Resolution (axial 10 µm; lateral 7.5 µm)
- OCT is an interferometric technique using relatively long-wavelength light in the near-IR portion of the spectrum.

CLINICAL TRIAL

BJD
British Journal of Dermatology

Optical coherence tomography of basal cell carcinoma: influence of location, subtype, observer variability and image quality on diagnostic performance*

J. Holmes,[1] T. von Braunmühl,[2] C. Berking,[2] E. Sattler,[2] M. Ulrich,[3] U. Reinhold,[4] H. Kurzen,[5] T. Dirschka,[6] C. Kellner,[7] S. Schuh[8] and J. Welzel[8]

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[2]University Hospital Munich, Department of Dermatology, Munich, Germany
[3]Private Dermatology Office/CMB Collegium Medicum Berlin GmbH, Berlin, Germany
[4]Dermatology Center Bonn Friedensplatz, Bonn, Germany
[5]Private Dermatology Office, Freising, Germany
[6]Private Dermatology Office, Wuppertal, Germany
[7]St Bernard-Hospital, Kamp-Lintfort, Germany
[8]General Hospital Augsburg, Department of Dermatology and Allergology, Augsburg, Germany

Linked Editorial: Rossi *et al. Br J Dermatol* 2018; 178:994–996.

What does this study add?

- Lesion location does not affect diagnostic performance with OCT.
- Poor OCT image quality is associated with superficial scales and crusting, reducing diagnostic performance, but in these cases diagnosis with OCT is better than by clinical or dermoscopy examination alone.
- Observers' diagnostic confidence increases when using OCT and their performance reflects this.
- Diagnostic performance is consistent between trained observers.
- BCC subtype can be diagnosed from OCT images with moderate accuracy.

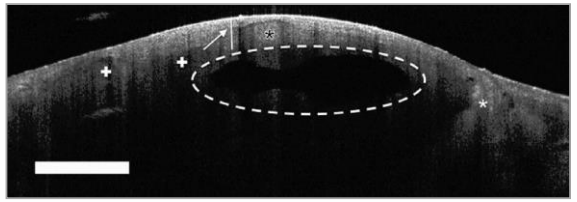


Fig 1. Example of a nodular basal cell carcinoma with typical characteristics, such as a poorly defined dermoepidermal junction (white line and white arrow), dark ovoid structures (+), ovoid structures with bright centre (black asterisk), black areas corresponding to cysts (white dashed circle) and surrounding bright stroma (white asterisk). Scale bar = 1.0 mm.

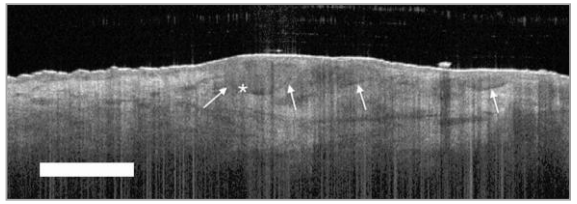


Fig 2. Superficial basal cell carcinoma (BCC). An example of tumour bulge intruding into the dermis (arrows) with an underlying dark border (asterisk), which are typical characteristics of superficial BCCs. Scale bar = 1.0 mm.

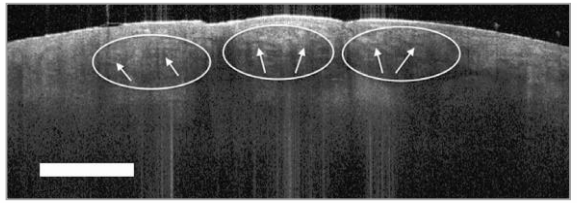


Fig 3. Infiltrative basal cell carcinoma (BCC). The characteristic feature of an infiltrative BCC is shown, the 'shoal of fish' (circle) consisting of clusters of narrow elongated dark structures (arrows). Scale bar = 1.0 mm.

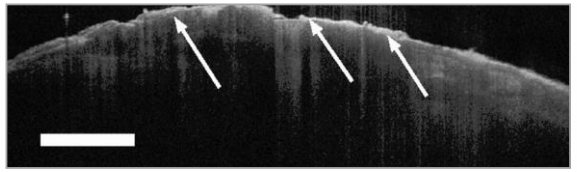


Fig 4. Example of mediocre image quality due to presence of crusting/scales (arrows). Scale bar = 1.0 mm.

Optical coherence tomography of basal cell carcinoma: influence of location, subtype, observer variability and image quality on diagnostic performance. Holmes J, et al. Br J Dermatol. 2018 May;178(5):1102-1110

SHORT REPORT

Dynamic optical coherence tomography of skin blood vessels – proposed terminology and practical guidelines

M. Ulrich,[1,*] L. Themstrup,[2] N. de Carvalho,[3] S. Ciardo,[3] J. Holmes,[4] R. Whitehead,[4] J. Welzel,[5] G.B.E. Jemec,[2] G. Pellacani[3]

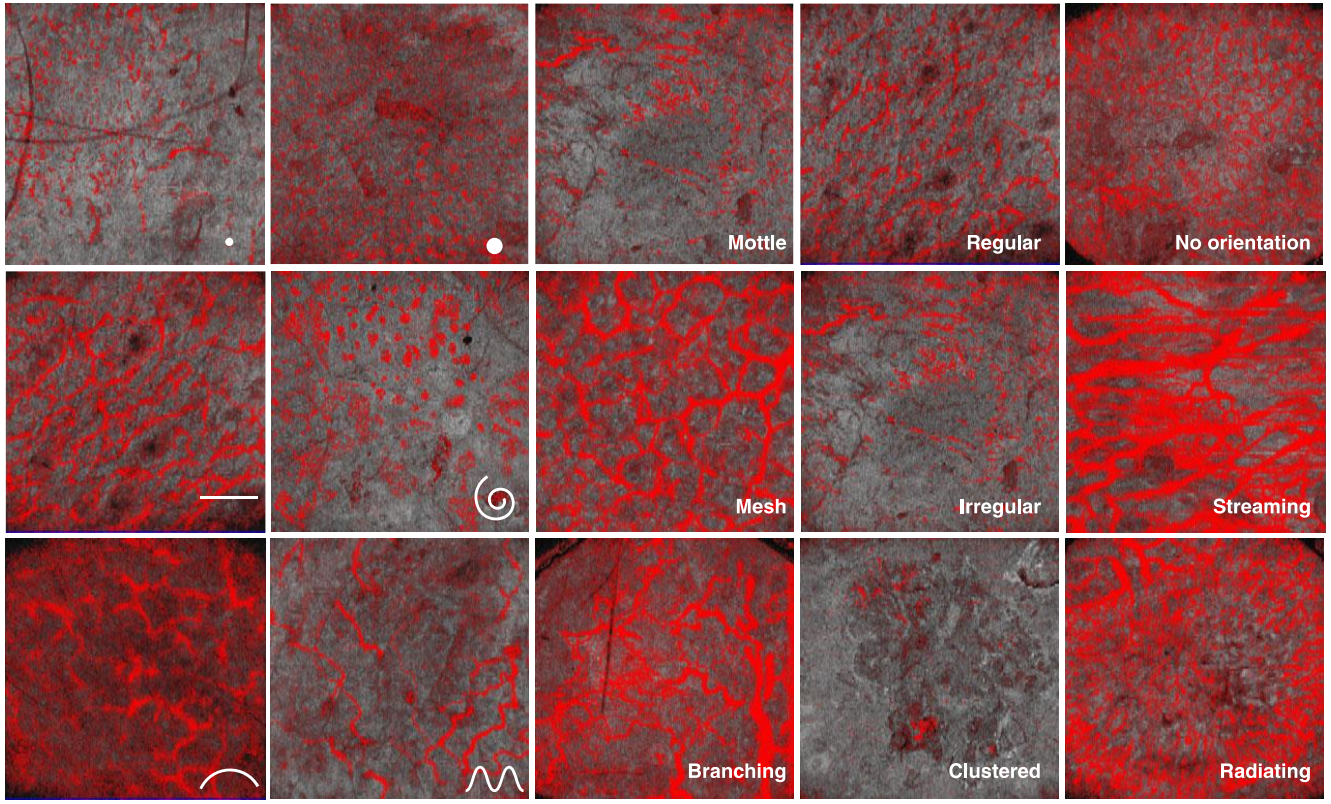
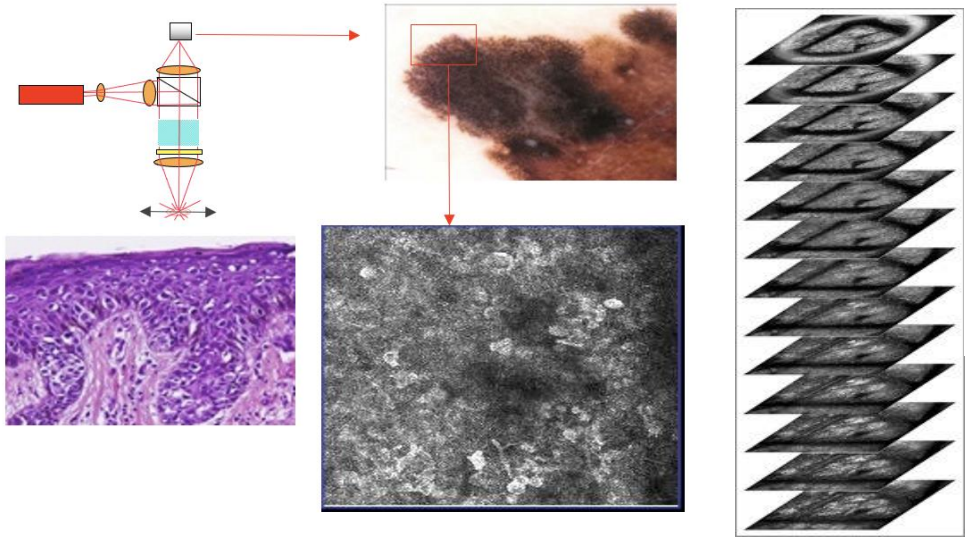
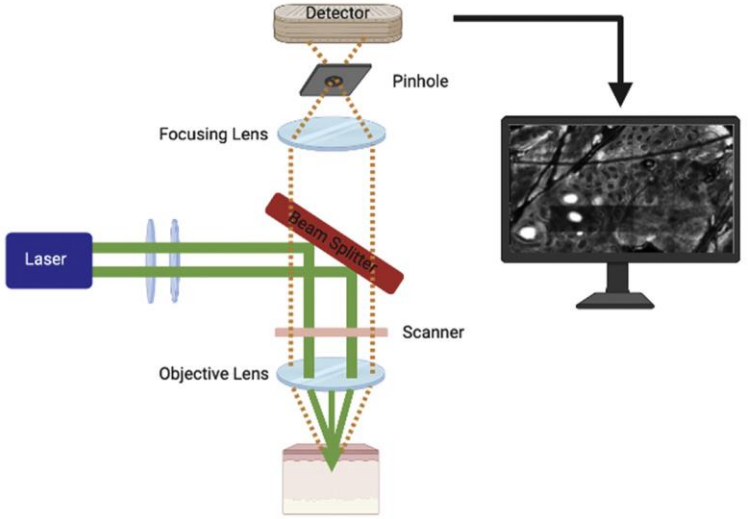
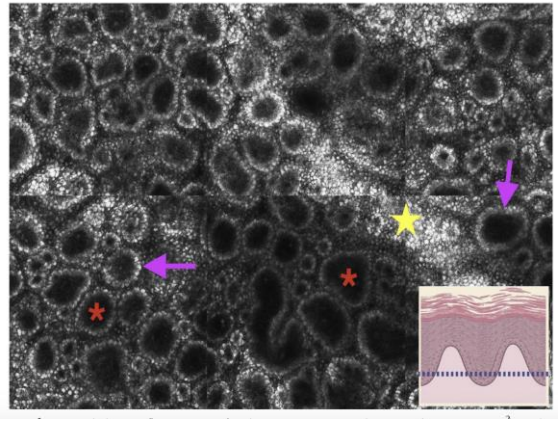


Figure 4 Correlations of schematic illustrations of the different shapes with real D-OCT images are presented.

Reflectance Confocal Microscopy







1. Non-invasive examination of skin or native tissue in reflectance, that does not require the use of fluorescence, dyes or stains.

2. Contrast in the image correlates to naturally occurring variations in **refractive index of organelles and micro structures** within the skin.

3. Confocal images contain **information about nuclear, cellular and architectural detail**, similar to that seen in histology sections.

4. The pigment **melanin** within the epidermis has a high refractive index, in fact higher than keratin.

5. The confocal microscope images keratinocytes in the **epidermis, erythrocytes and leukocytes in capillaries within the papillary dermis and collagen bundles** within the dermis to a **depth of 100-200 µm at the 830 nm wavelength**.

67 years old lady consulting for stetic reasons for a ligh pigmented lesion on the face.Previous cryotherapy years before in another centre. Clinical image.

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Dermoscopy exhibits a scar-like lesion probably due to previous cryotherapy. Non-specific light brown pigmentation

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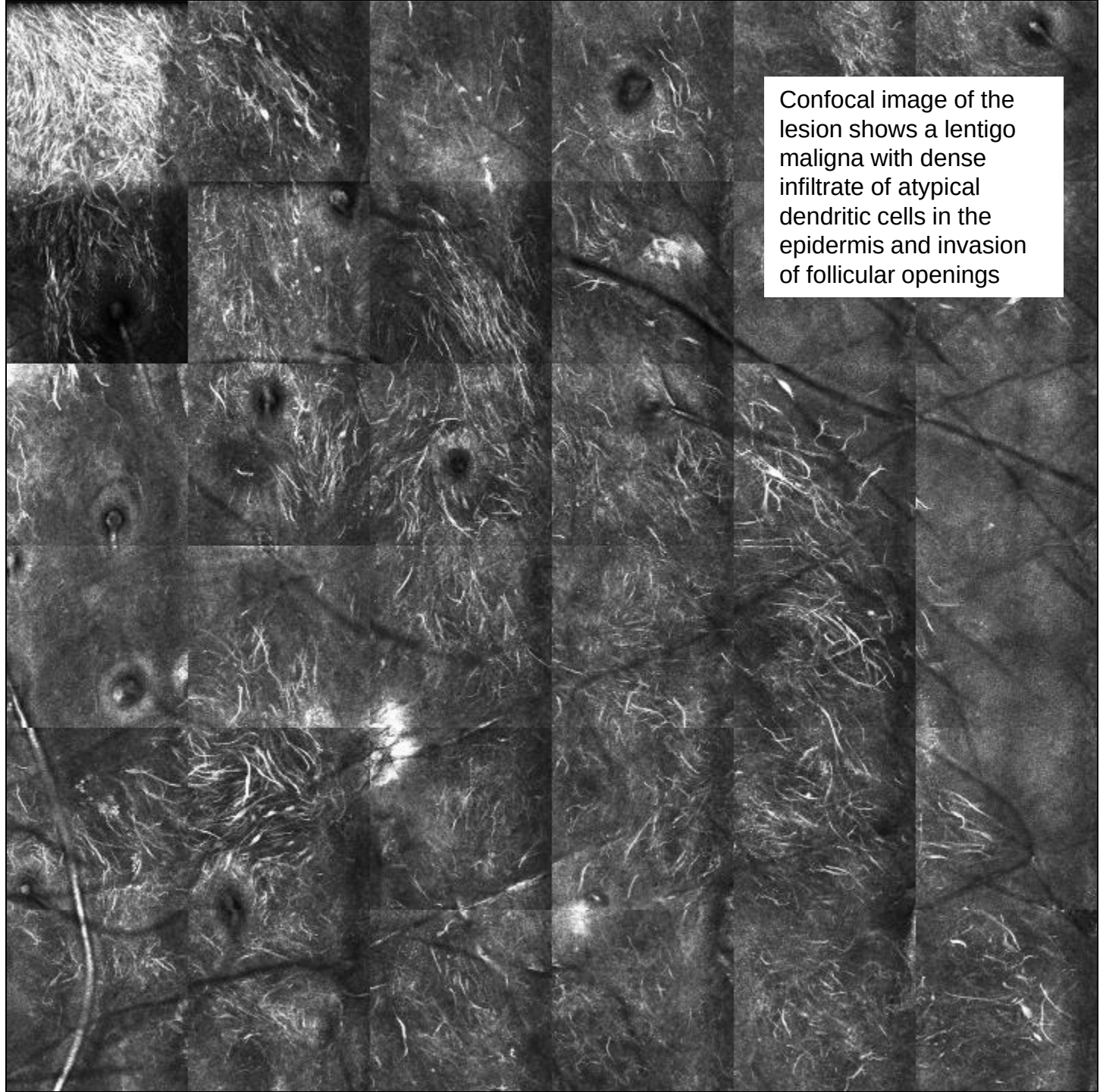

Confocal image of the lesion shows a lentigo maligna with dense infiltrate of atypical dendritic cells in the epidermis and invasion of follicular openings

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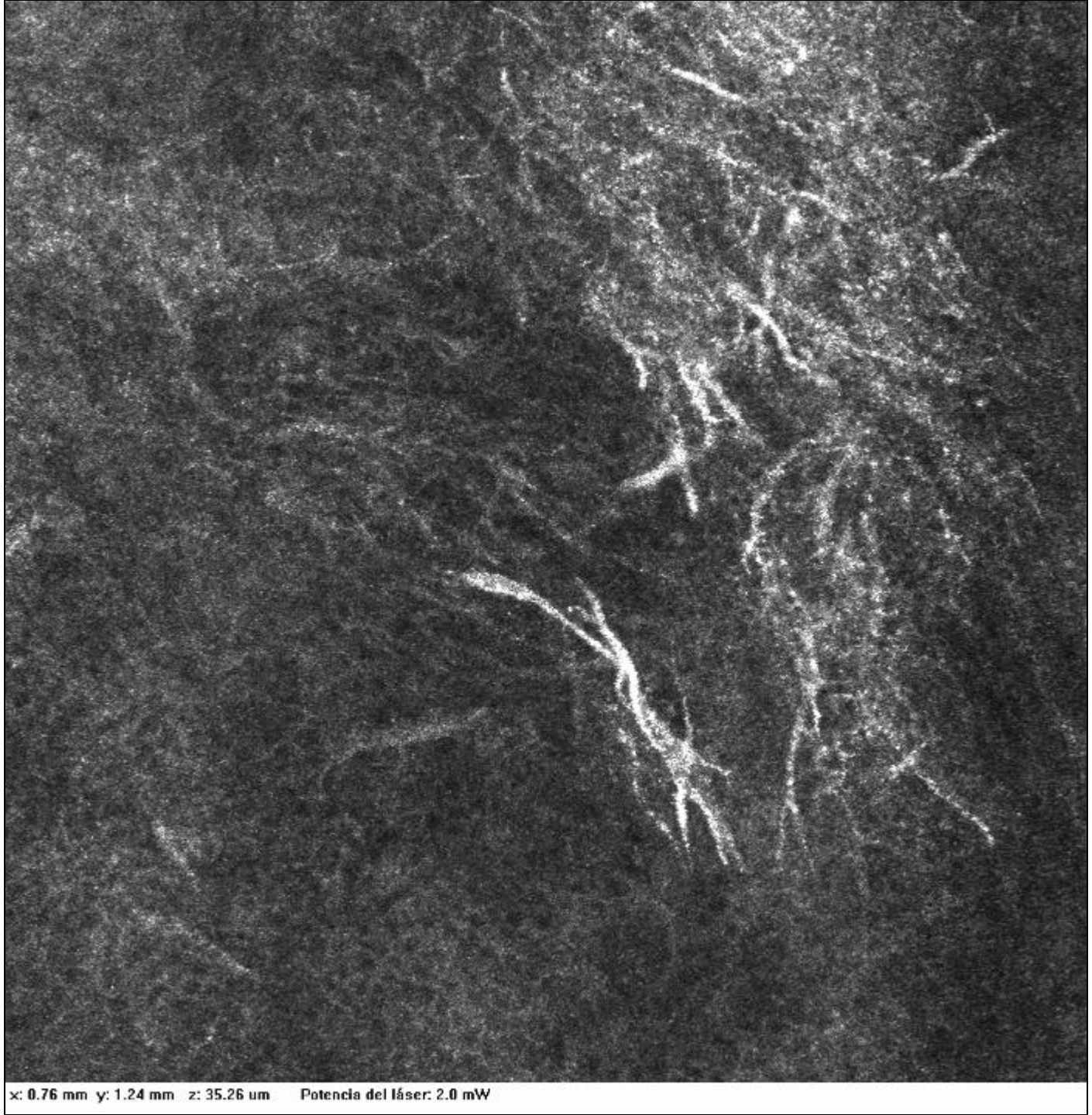

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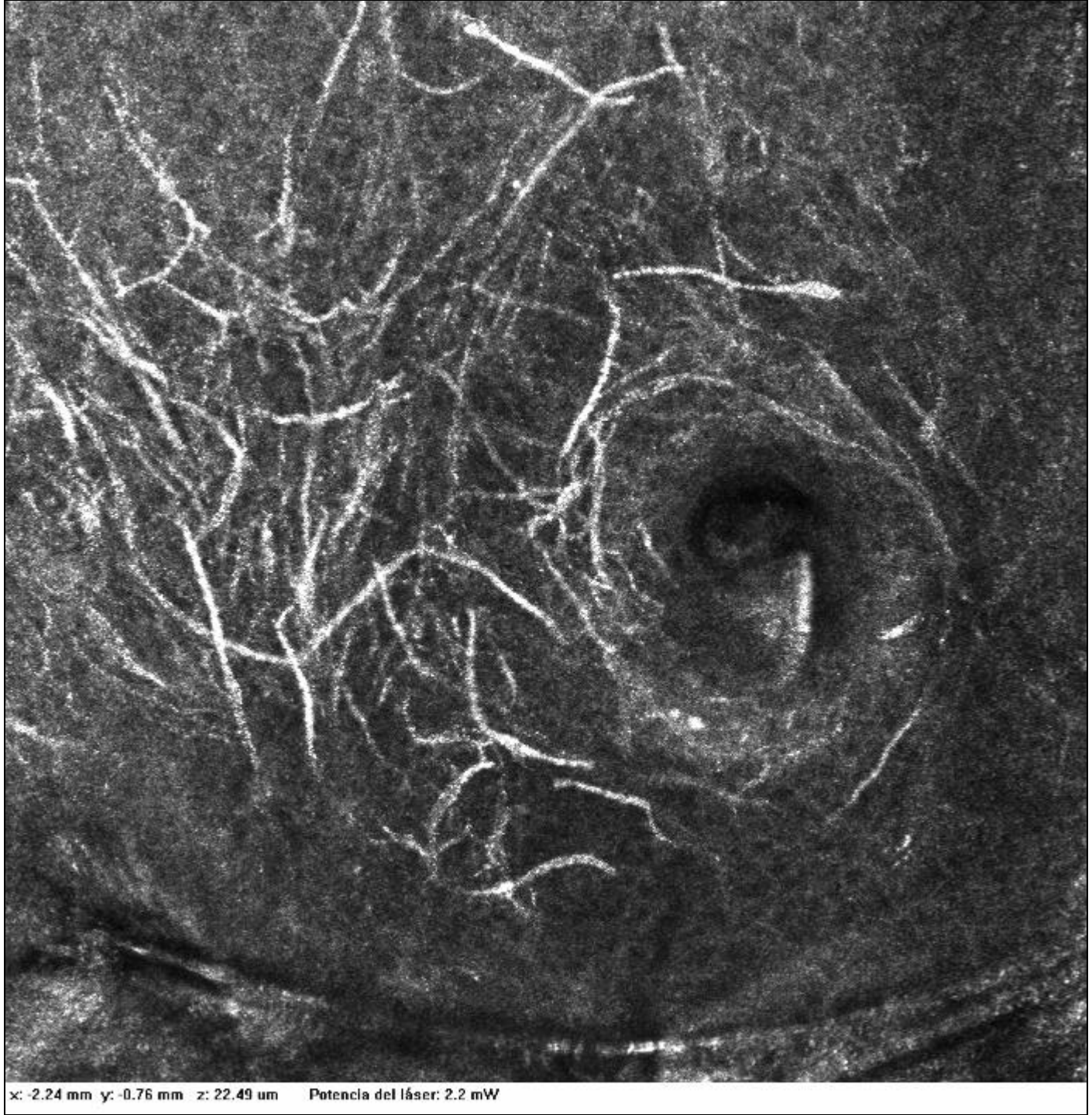

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BJD

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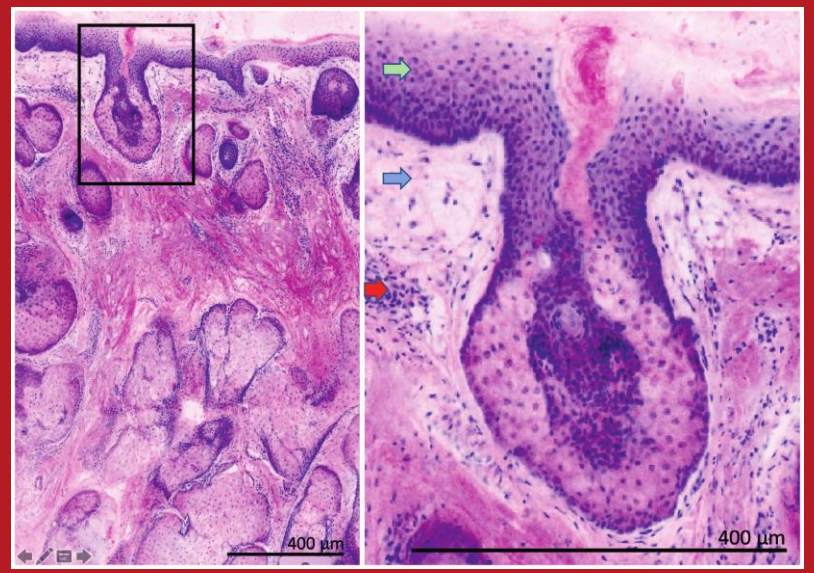
British Association of Dermatologists Centenary

THE FIRST 100 YEARS OF SUPPORTING DERMATOLOGY RESEARCH EXCELLENCE



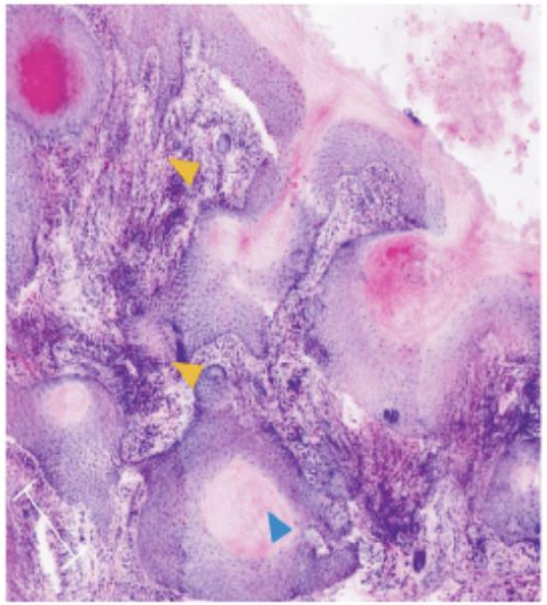
December 2020

WILEY

Editor's Choice December 2020 John Ingram

'Fast pathology': a review of *ex vivo* confocal microscopy

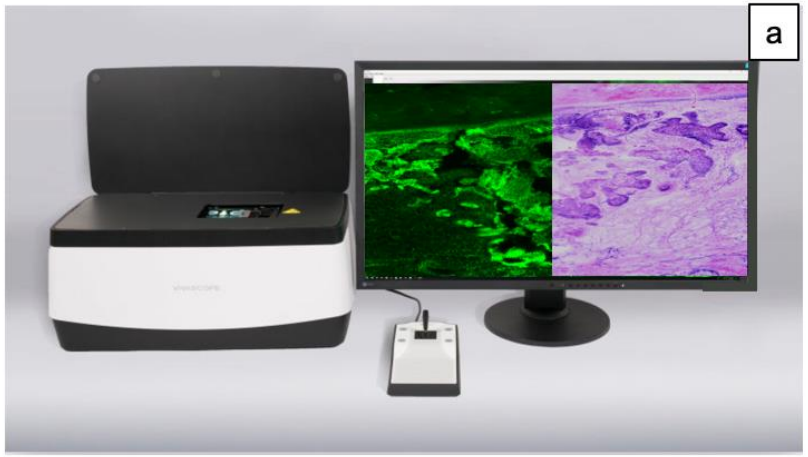
Confocal microscopy (CM) permits high-resolution images of fresh, non-fixed skin specimens, which can be optically scanned in slices. Improvements in *ex vivo* CM allow visualization of cellular and architectural details, similarly to standard pathology. Digital staining with haematoxylin and eosin is incorporated in newer devices and immunostaining is also now possible. Currently, *ex vivo* CM is used mainly for intraoperative control of surgical margins of cutaneous tumours in Mohs surgery. However, new applications are being developed and, in their comprehensive review, Malvehy and coauthors describe the logistics, advantages and limitations of *ex vivo* CM.

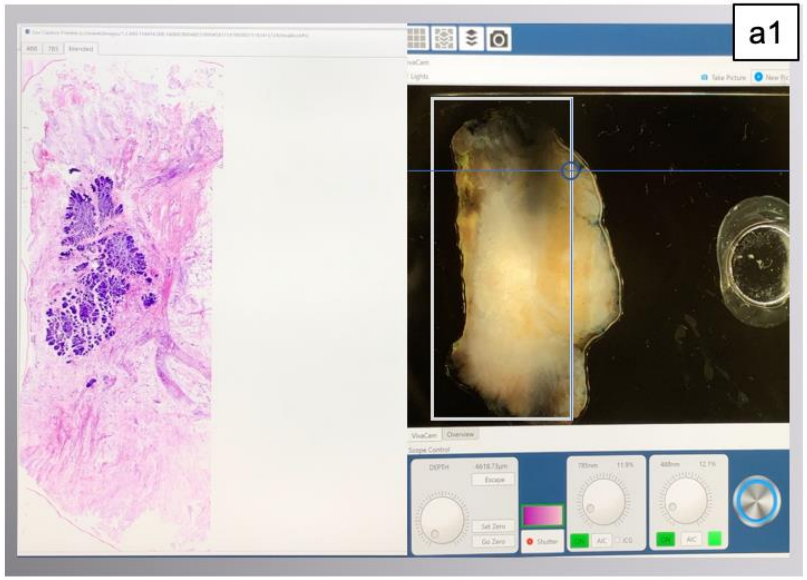


Squamous cell carcinoma with invasive areas (yellow triangles) and keratin pearl (blue triangle).

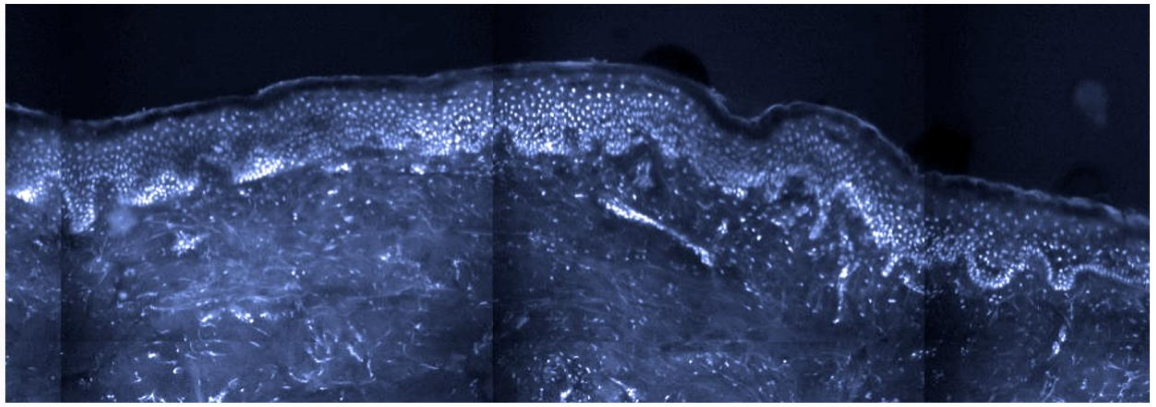
Malvehy J, Pérez-Anker J, Toll A *et al*. Ex vivo confocal microscopy: revolution in fast pathology in dermatology. Br J Dermatol 2020; **183**:1011–1025.

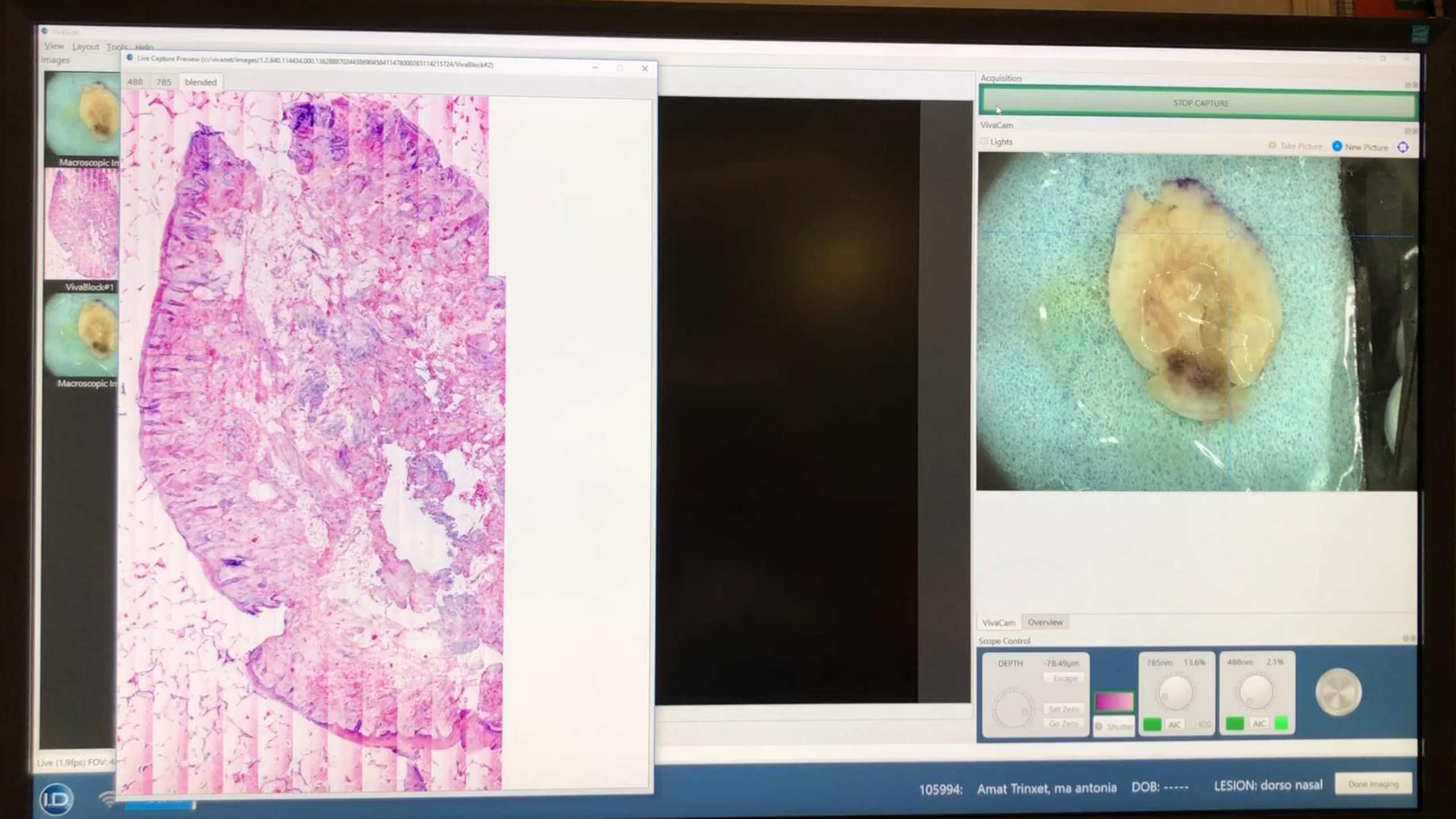
Ex-vivo confocal microscopy





- Fast pathology in 5 minutes
- No damage of the tissue for regular pathology
- Surgical pathology in skin cancer and other tumours

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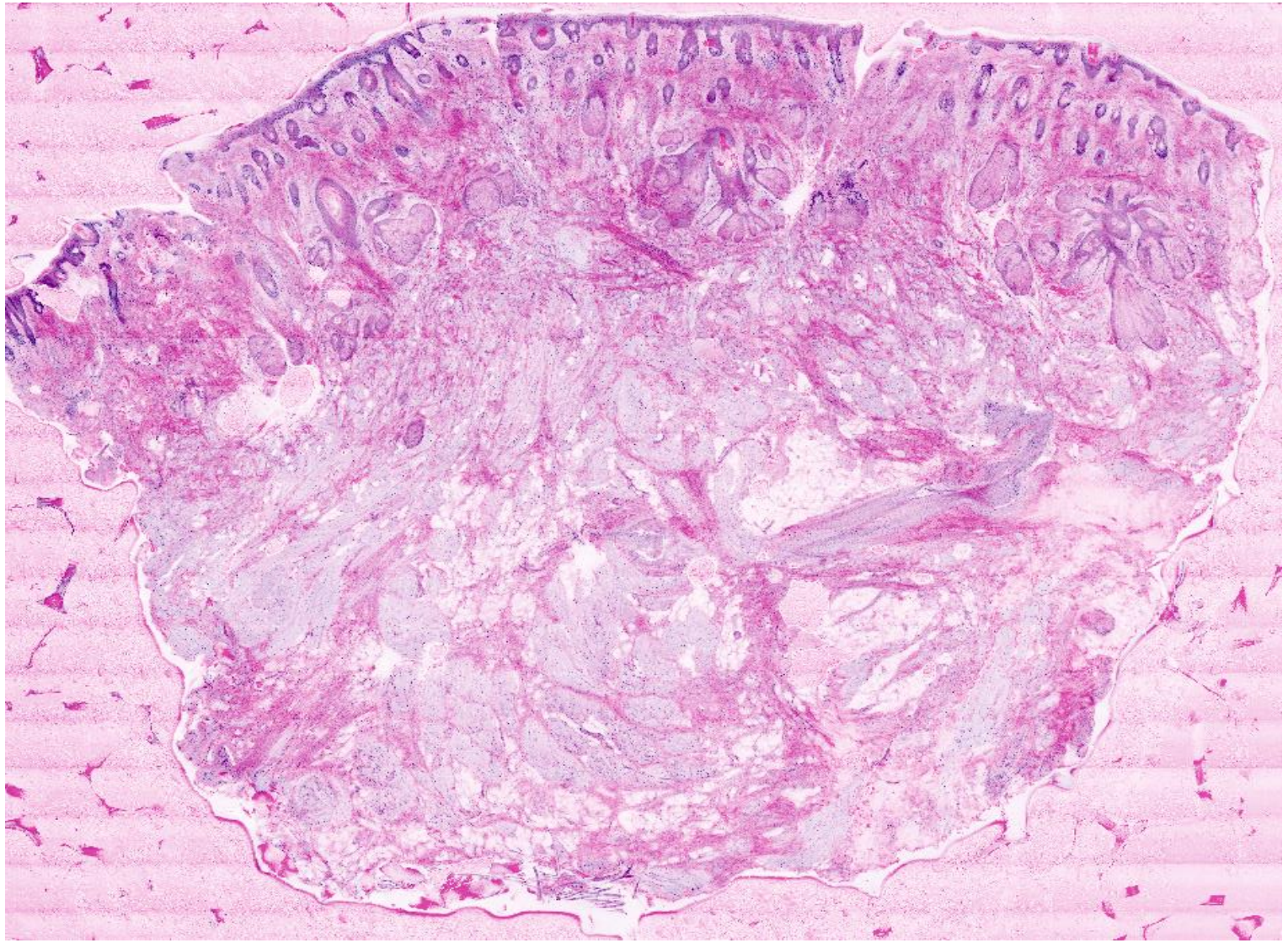

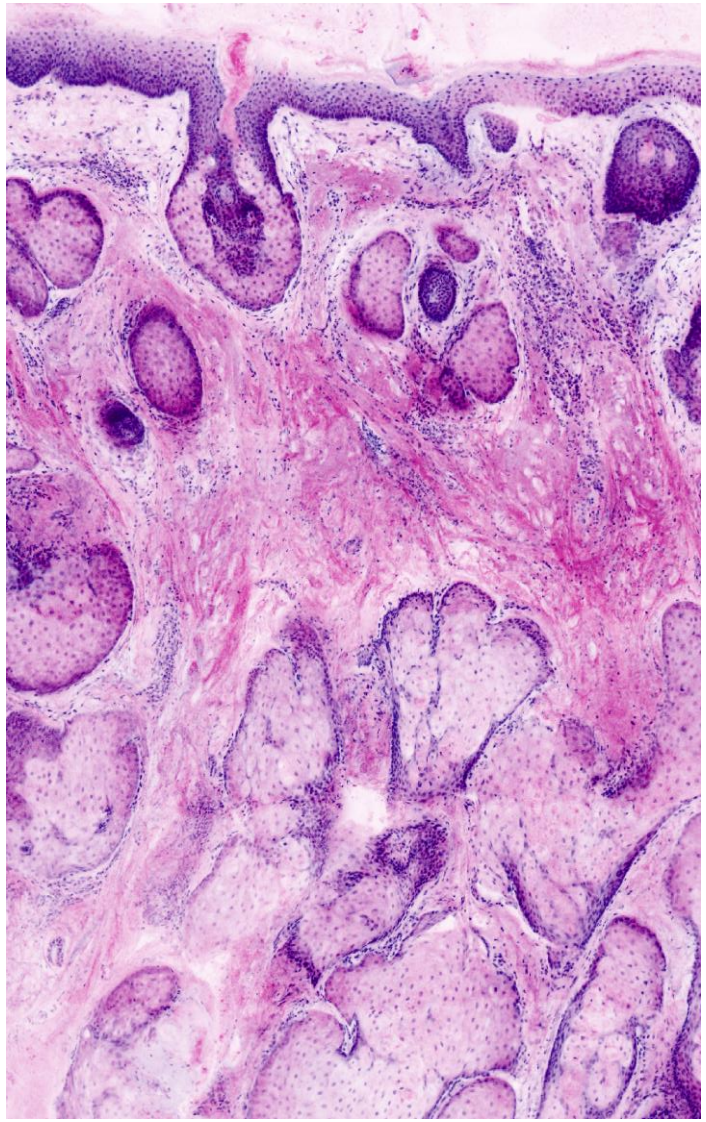

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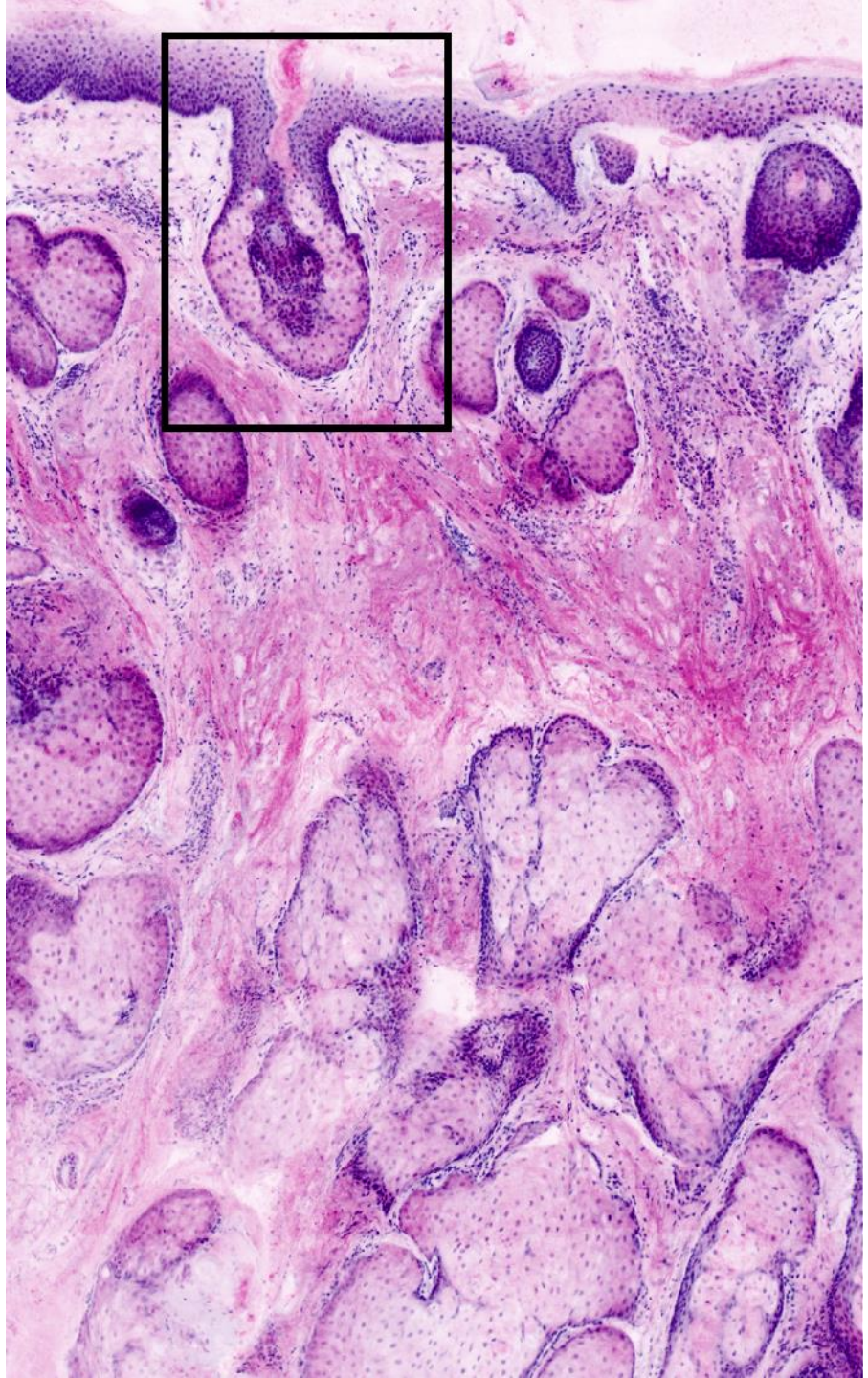
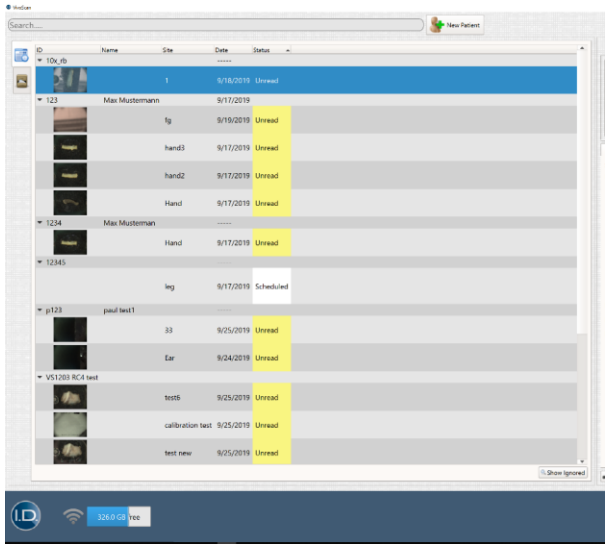
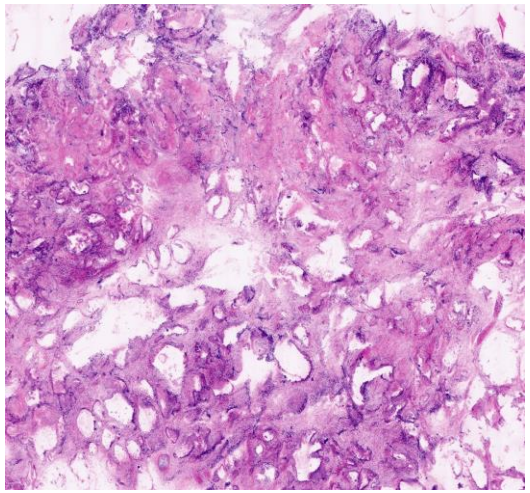
H&E virtual staining. Fusion CM mode. Vivascope 4Gen.



VivaNet Connectivity





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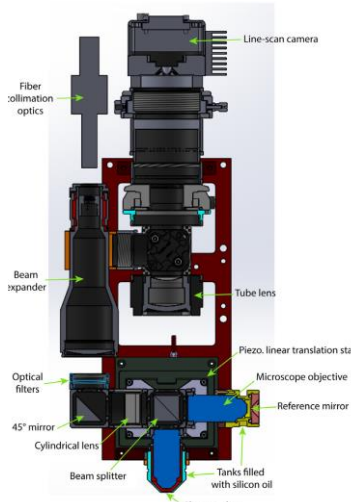
Journal of Biomedical Optics

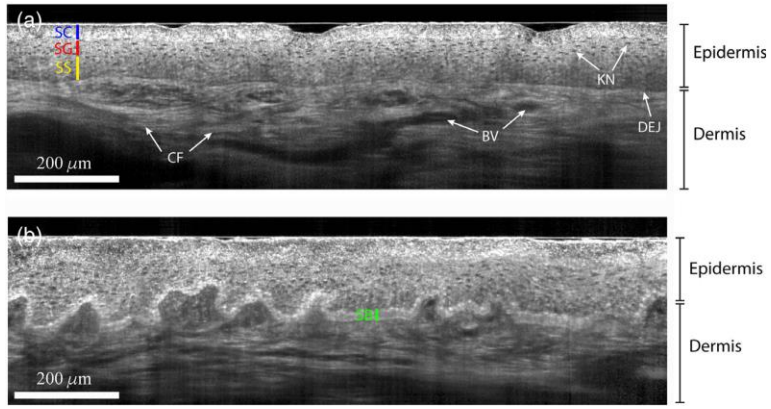
BiomedicalOptics.SPIEDigitalLibrary.org

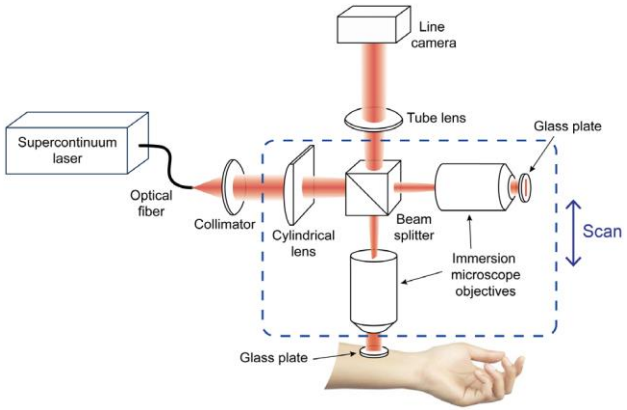
LC-OCT measures the echo-time delay and amplitude of light backscattered from cutaneous microstructures through low-coherence interferometry associated with confocal spatial filtering.
Cross- sectional B-scan image is produced in real time at 10 frame⁄sec. With an isotropic spatial resolution of ~1 µm, the LC-OCT images reveal a comprehensive structural mapping of skin at the cellular level down to a depth of ~500 µm.

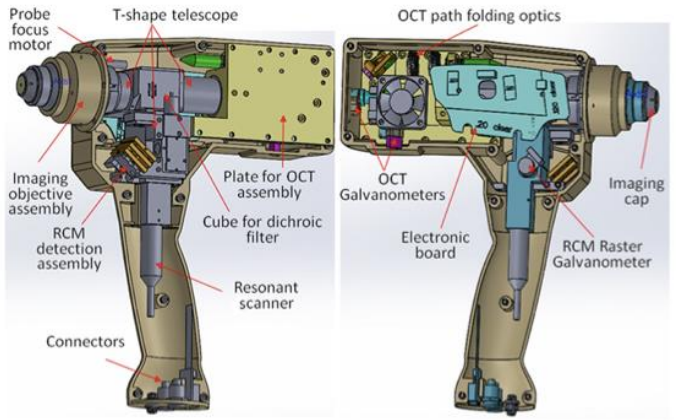
Line-field confocal optical coherence tomography for high-resolution noninvasive imaging of skin tumors

Arnaud Dubois
Olivier Levecq
Hicham Azimani
David Siret
Anaïs Barut
Mariano Suppa
Véronique del Marmol
Josep Malvehy
Elisa Cinotti
Pietro Rubegni
Jean-Luc Perrot



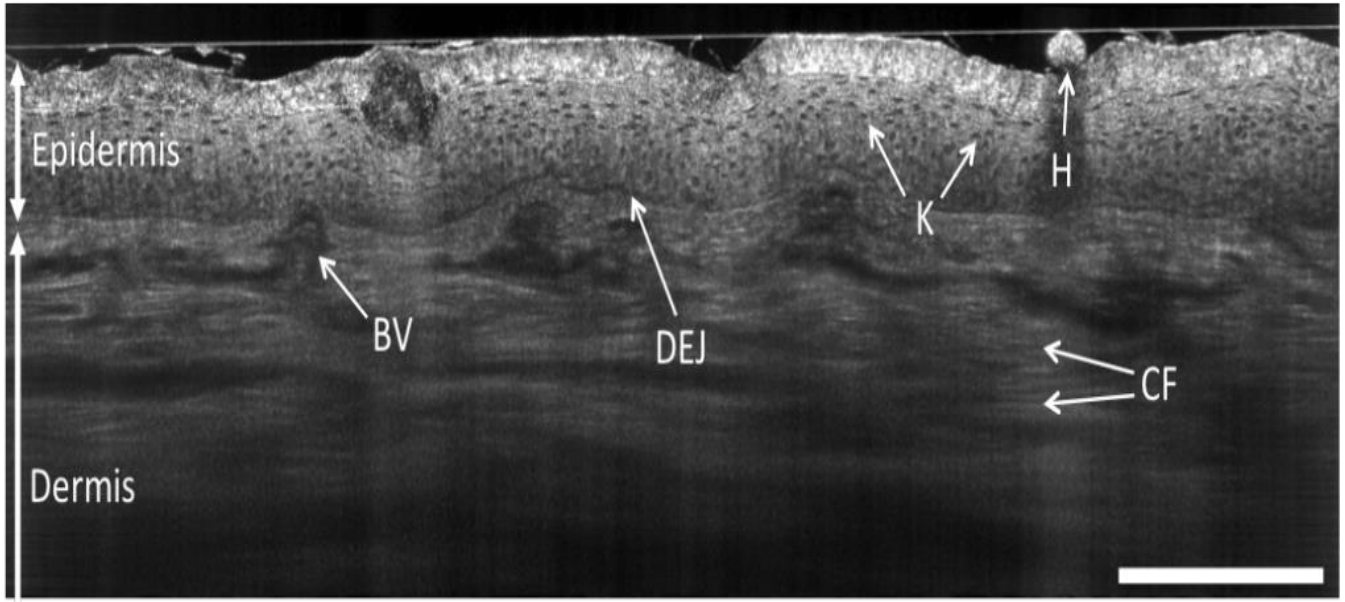


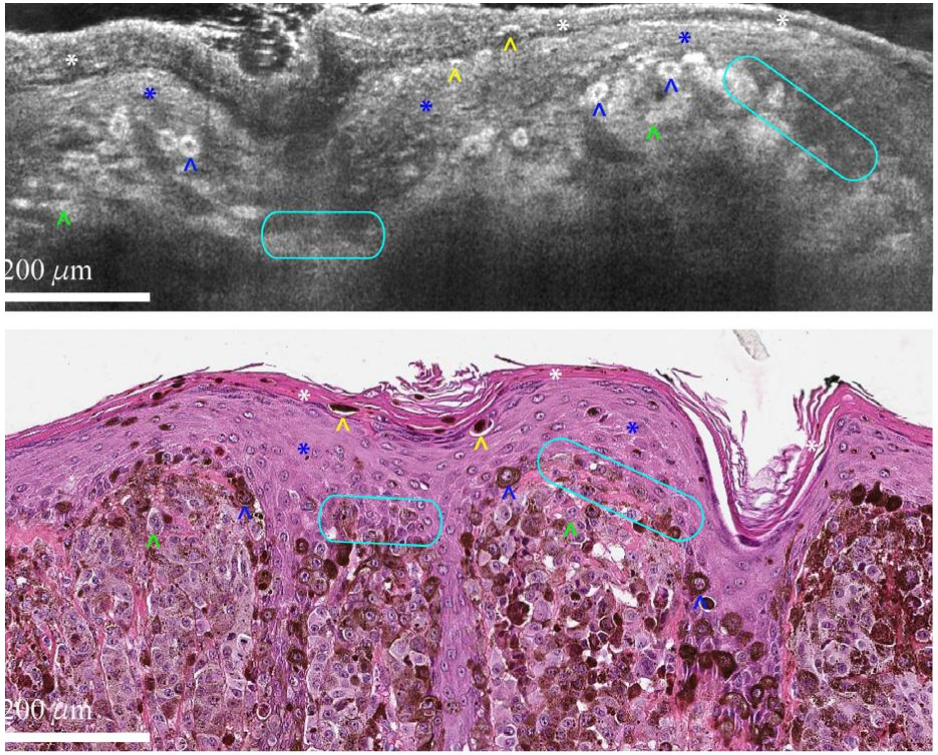




Arnaud Dubois, Olivier Levecq, Hicham Azimani, David Siret, Anaïs Barut, Mariano Suppa, Véronique del Marmol, Josep Malvehy, Elisa Cinotti, Pietro Rubegni, Jean-Luc Perrot, "Line-field confocal optical coherence tomography for high-resolution noninvasive imaging of skin tumors," *J. Biomed. Opt.* **23**(10), 106007 (2018), doi: 10.1117/1.JBO.23.10.106007.

Line-field Confocal Optical Coherence Tomography (LC-OCT)





B-scan image of healthy human skin (back of the hand), obtained with LF-OCT (Scale bar: 200µm)

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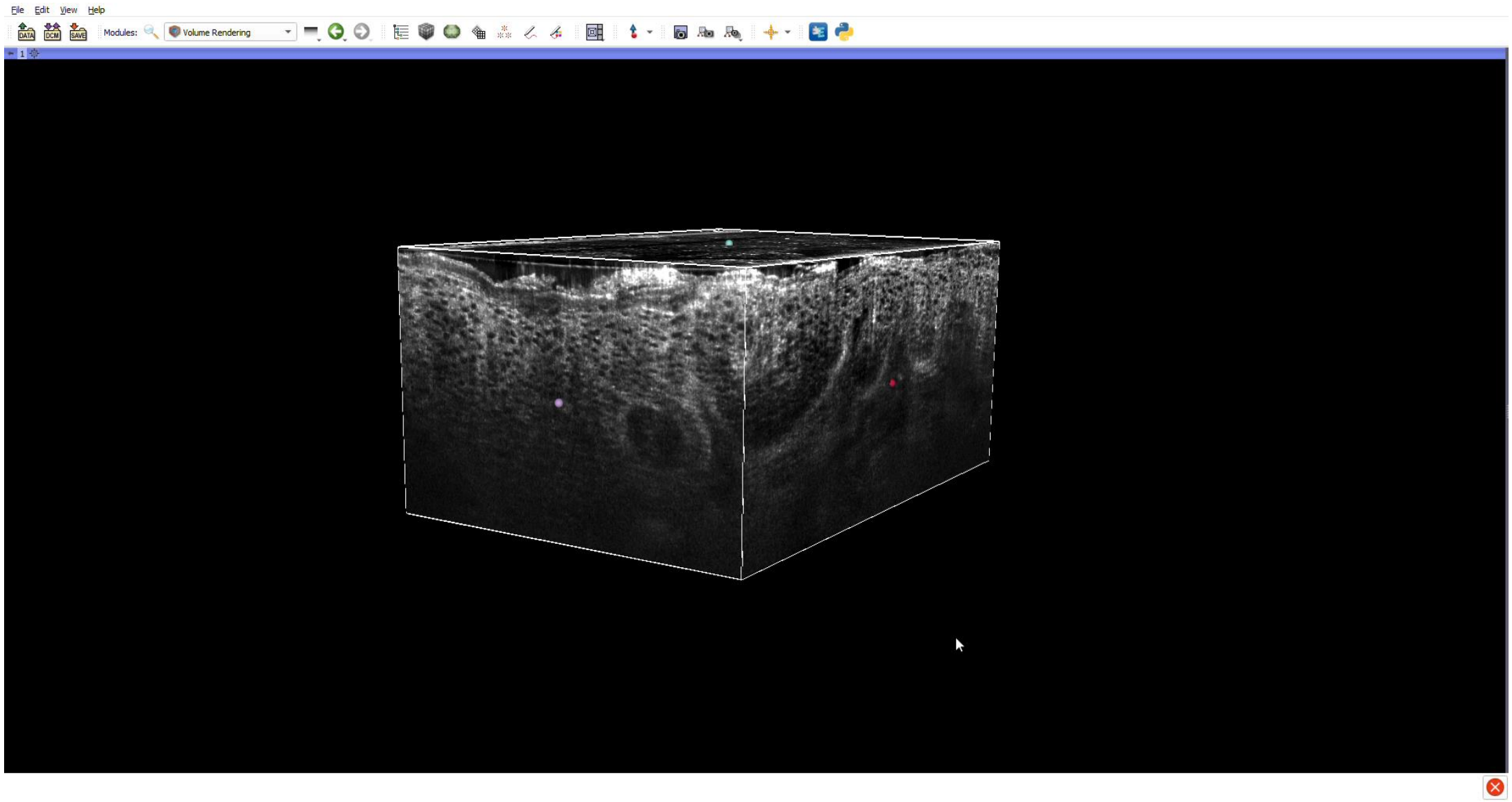
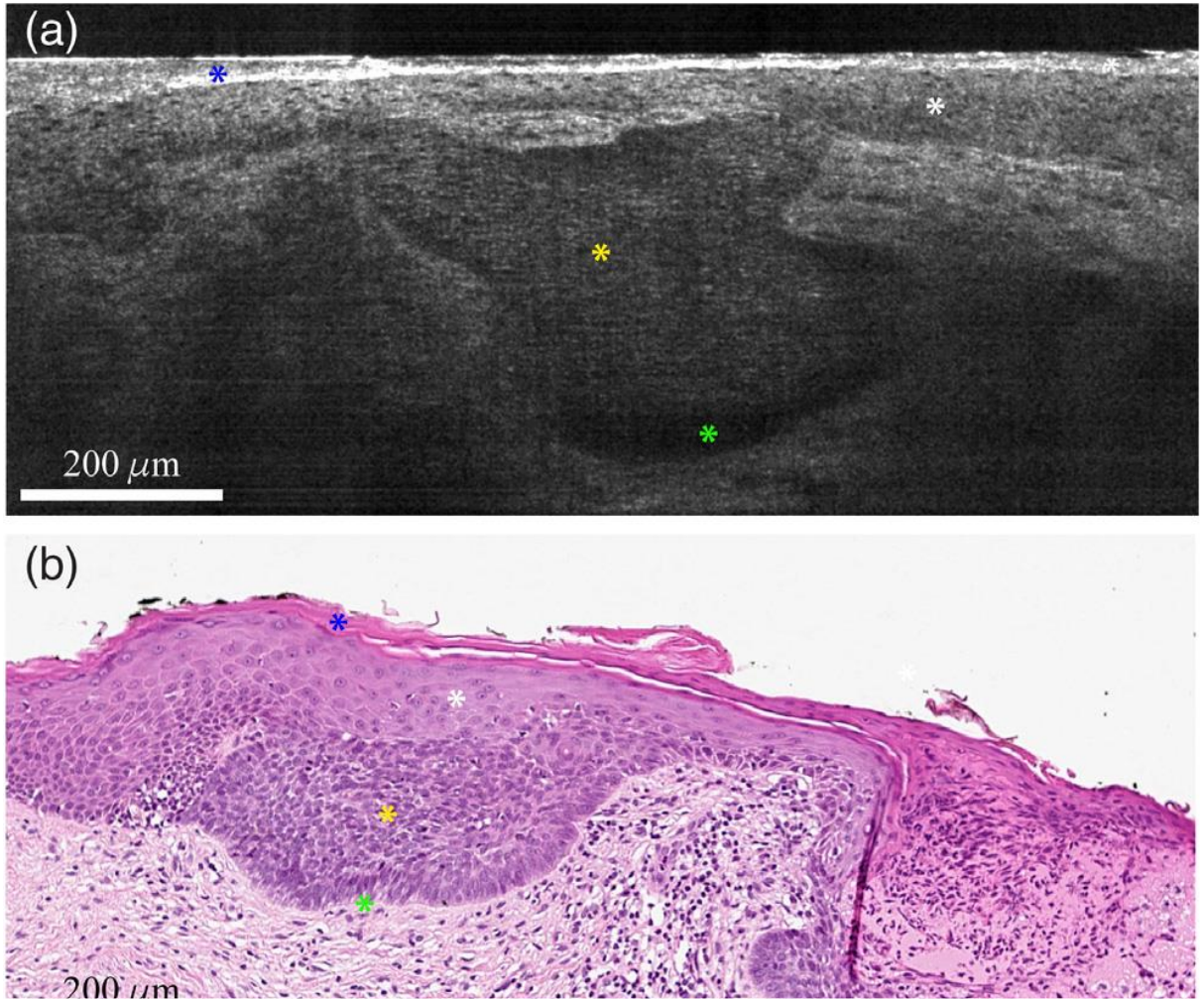
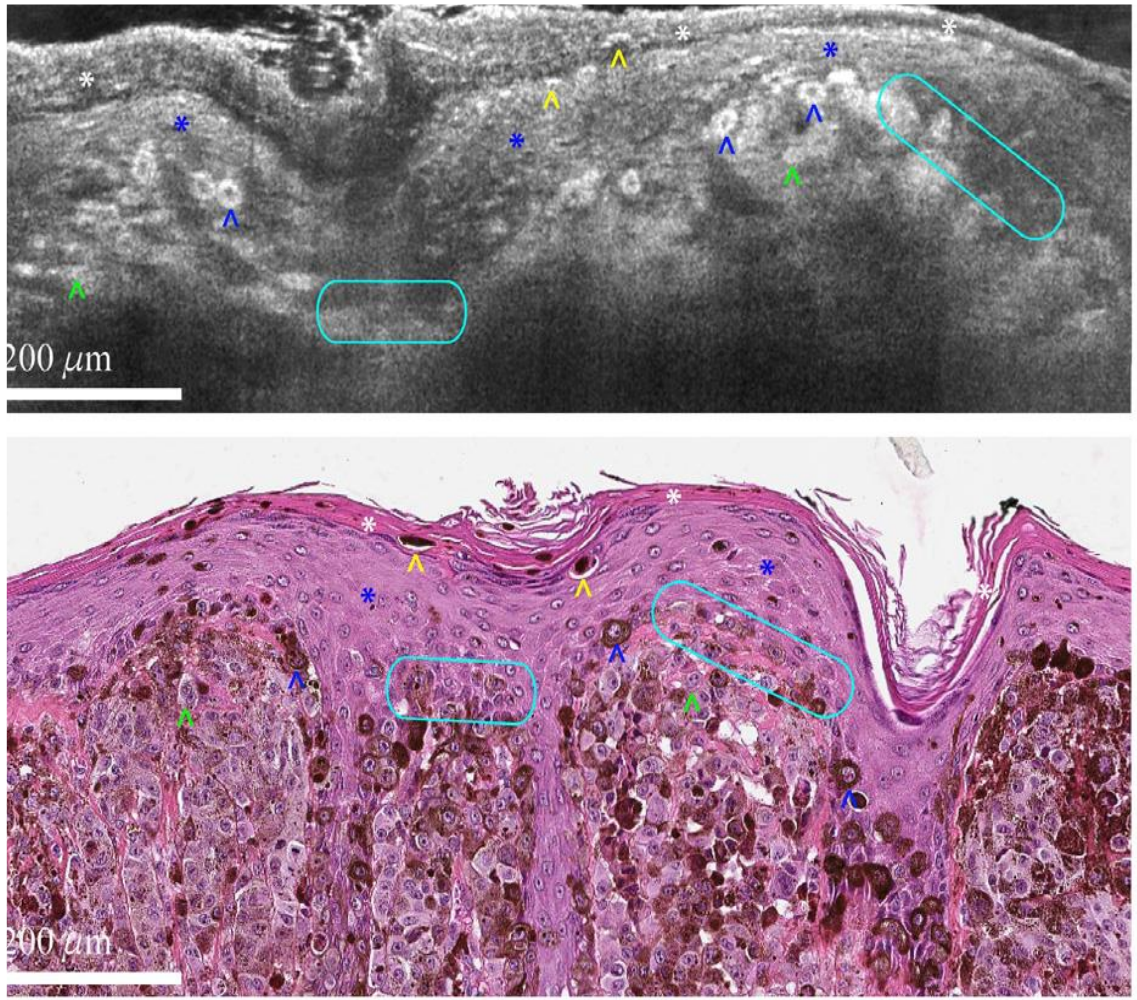


Line-field Confocal Optical Coherence Tomography (LC-OCT)

Basal cell carcinoma



Melanoma



Consortium for research in LC-OCT

Hôpital Erasme – ULB
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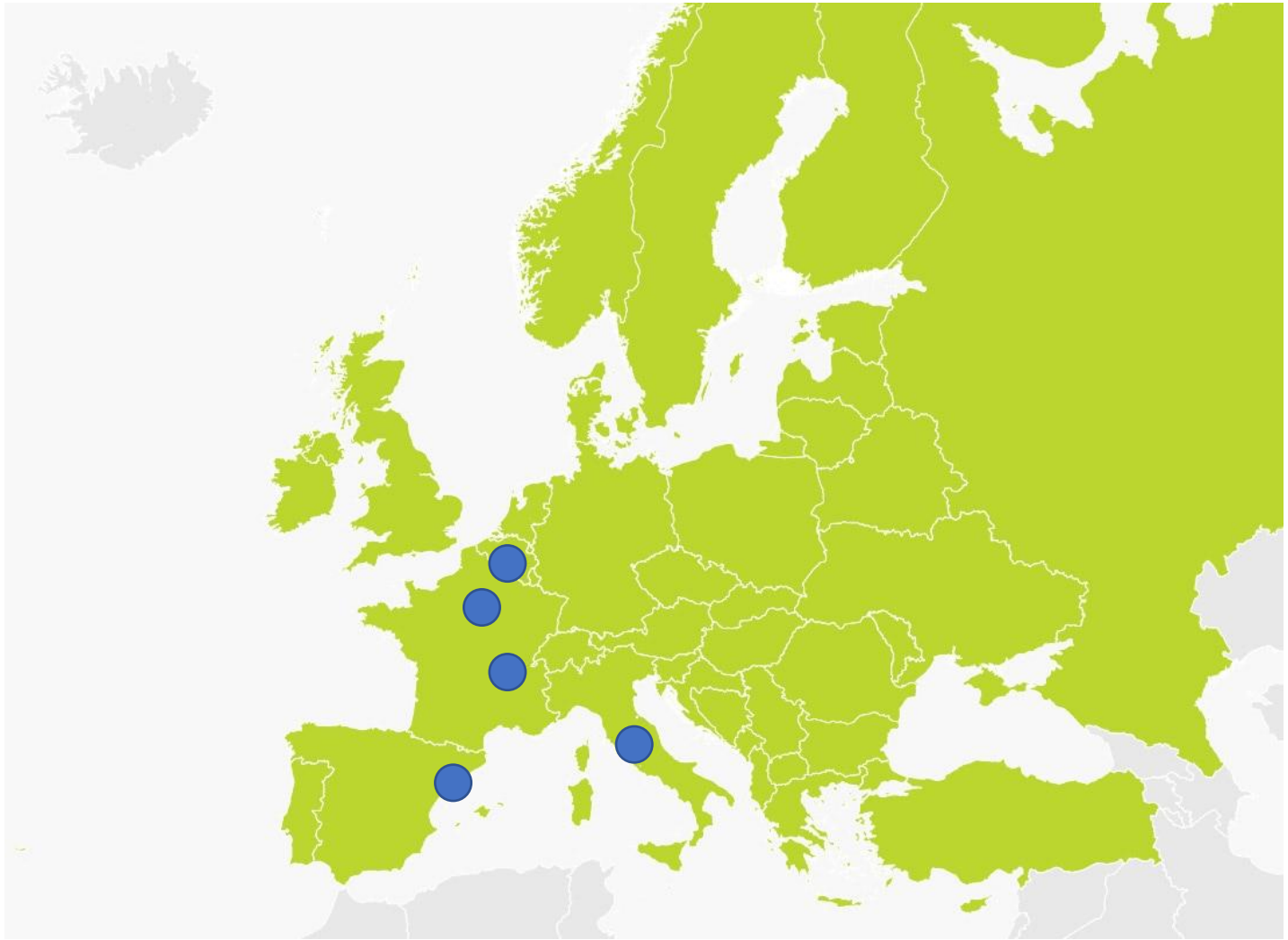
Mariano Suppa
Jovanie Razafindrakoto
Florence Bourlond

Hôpital St Etienne
Jean Luc Perrot

Hosp.Clínic Barcelona
Josep Malvehy
Susana Puig
Javiera Pérez

University of Siena, S. Maria alle Scotte Hospital
Pietro Rubegni
Elisa Cinotti
L. Tognetti

DAMAE
Maxime Cazalas
Clothilde Raoux
Nicolas Linard



P116, L1

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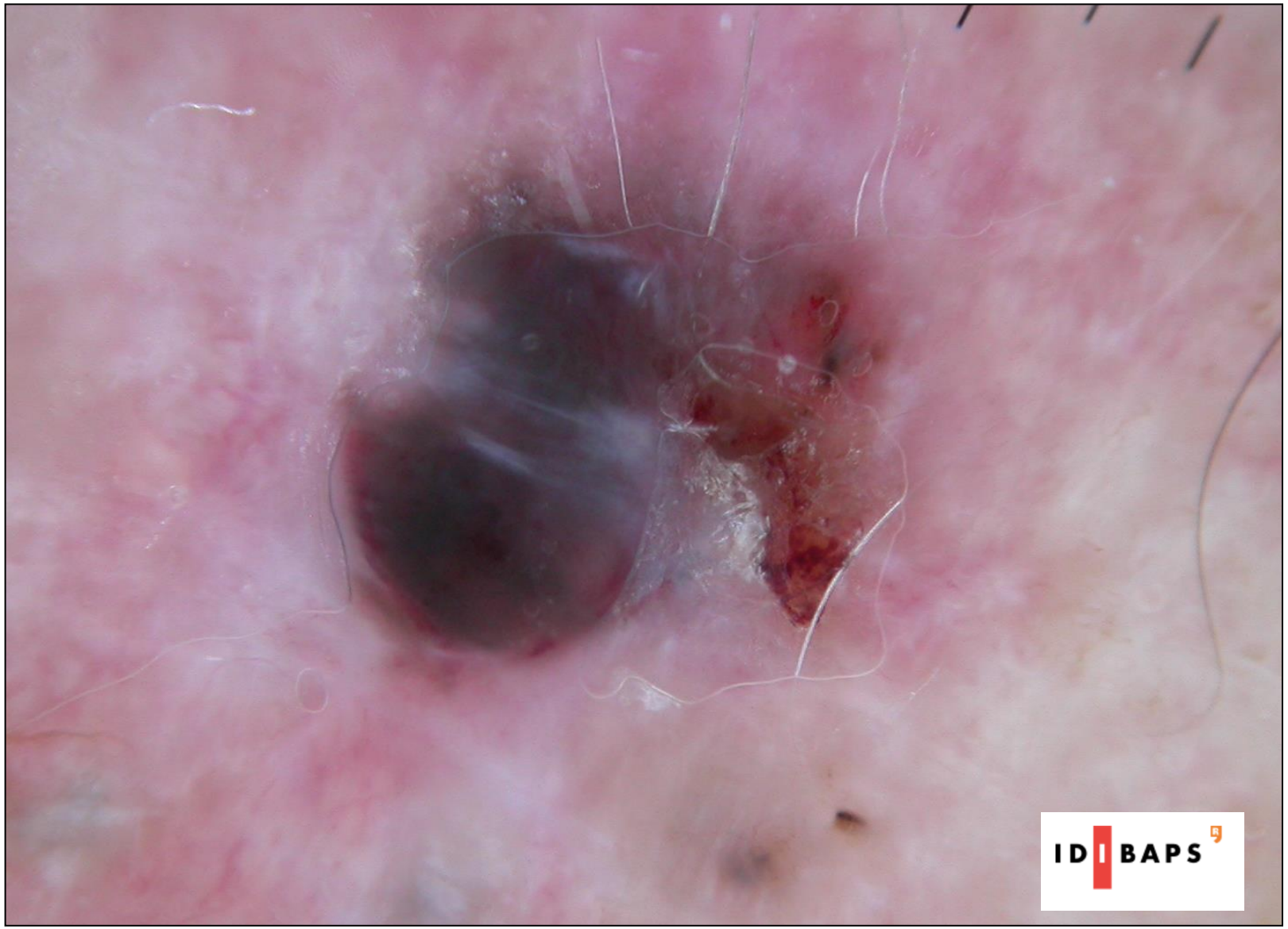
P116, L1



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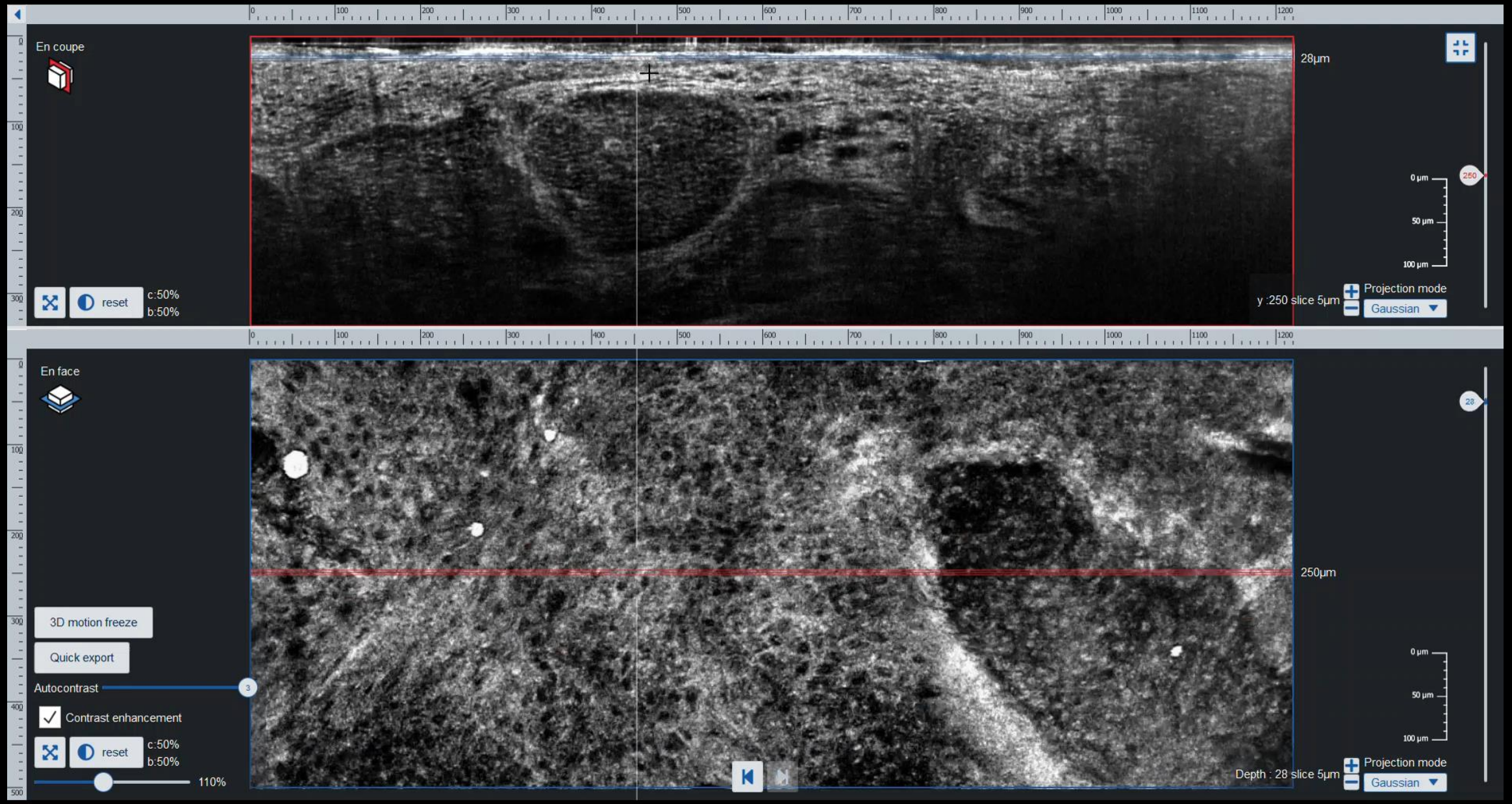
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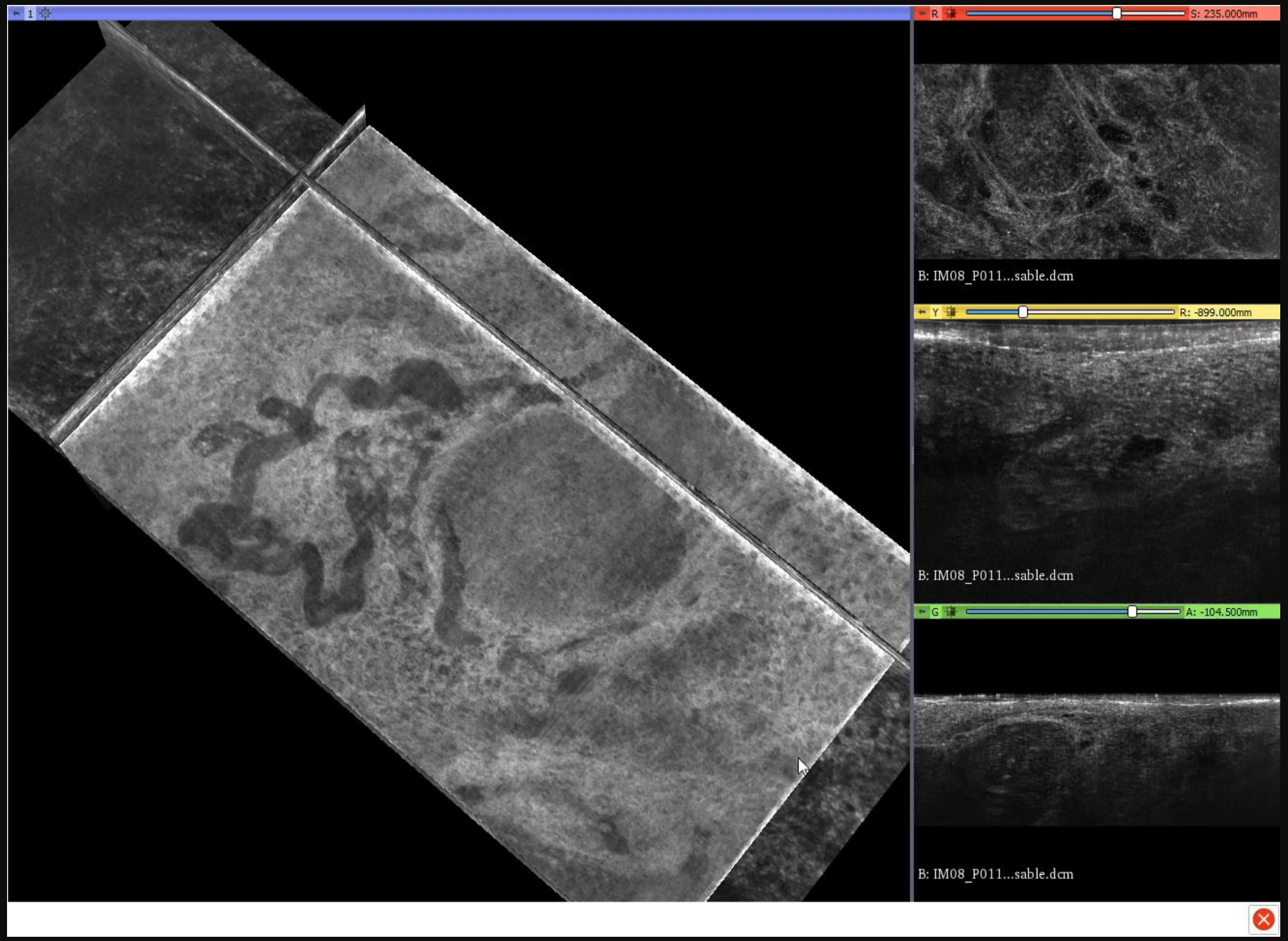
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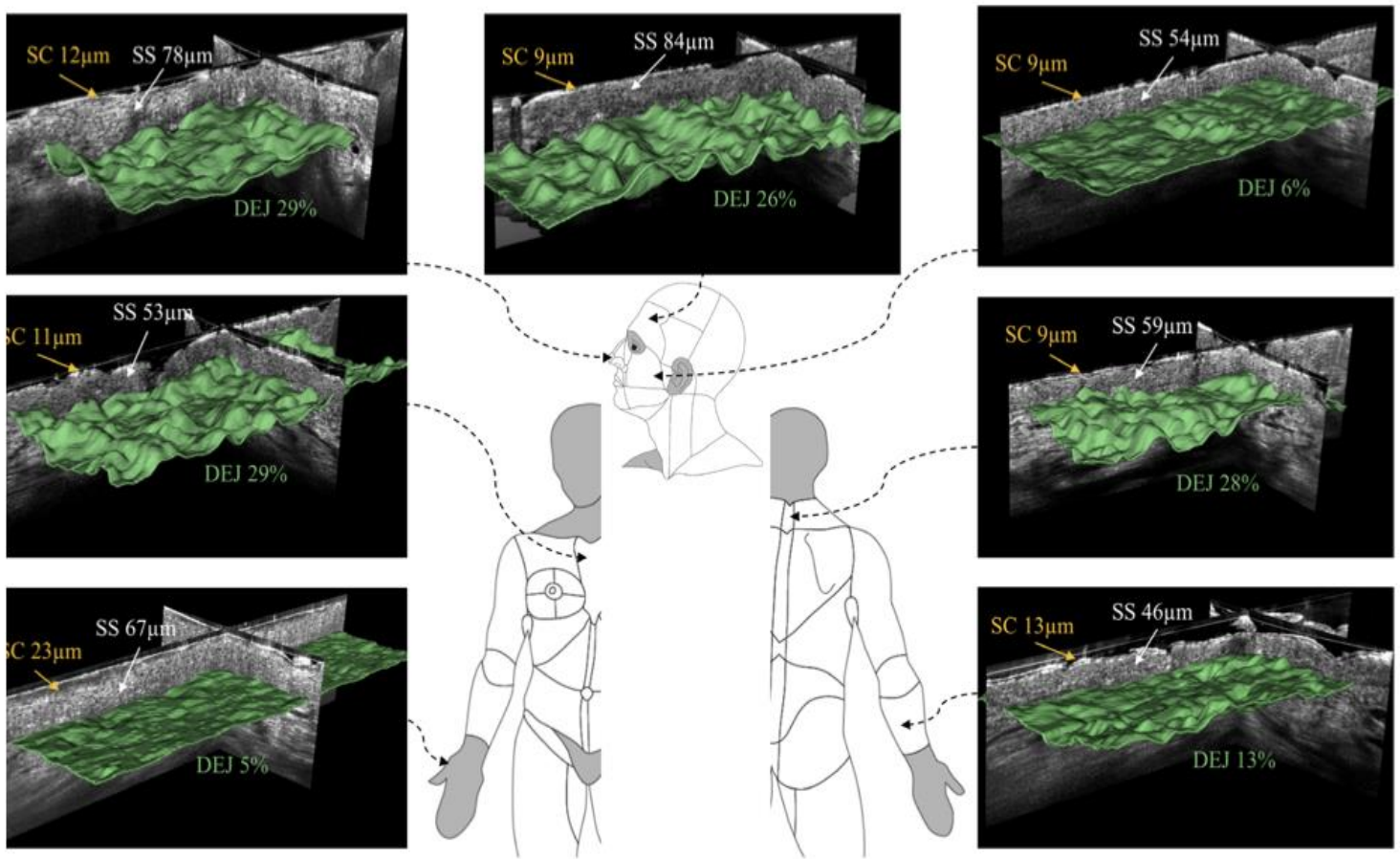
movie

Measurement of photoageing: lineal confocal-OCT (LC-OCT)



3D LC-OCT quantification of epidermal characteristics in seven body sites on the same subject (27-year-old female, phototype II). The thickness of stratum corneum (SC) and stratum spinosum (SS) are reported in µm, whereas the undulation of the dermal- epidermal junction (DEJ, green layer) is expressed in percentage (Chauvel-Picard J et al)

Chauvel-Picard J, Bérot V, Tognetti L, Orte Cano C, Fontaine M, Lenoir C, Pérez-Anker J, Puig S, Dubois A, Forestier S, Monnier J, Jdid R, Cazorla G, Pedrazzani M, Sanchez A, Fischman S, Rubegni P, Del Marmol V, Malvehy J, Cinotti E, Perrot JL, Suppa M. Line-field confocal optical coherence tomography as a tool for three-dimensional in vivo quantification of healthy epidermis: A pilot study. J Biophotonics. 2022 Feb;15(2):e202100236. doi: 10.1002/jbio.202100236. Epub 2021 Oct 21. PMID: 34608756.

scientific reports

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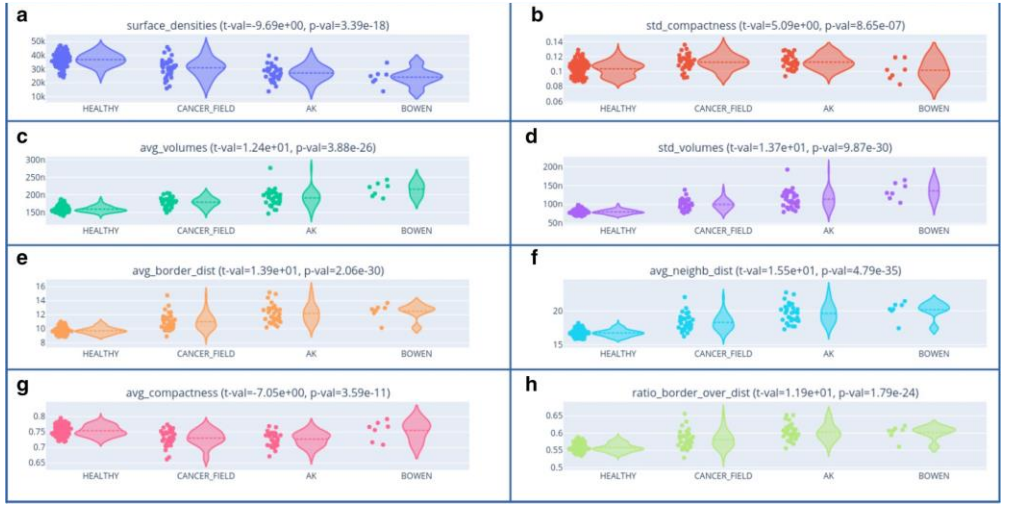
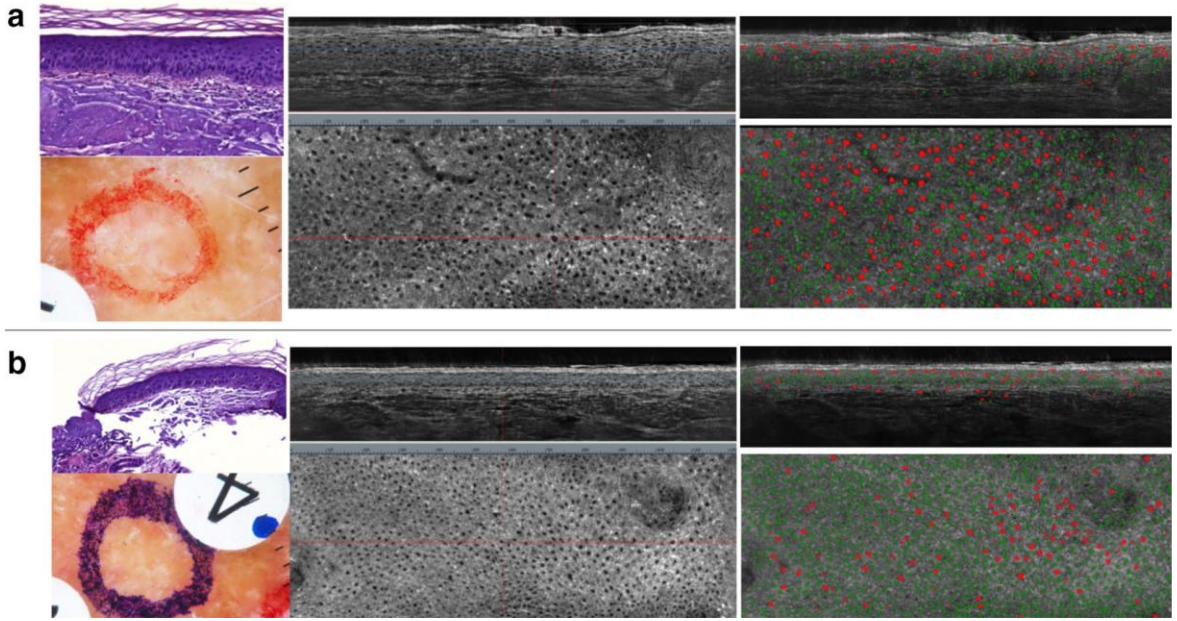
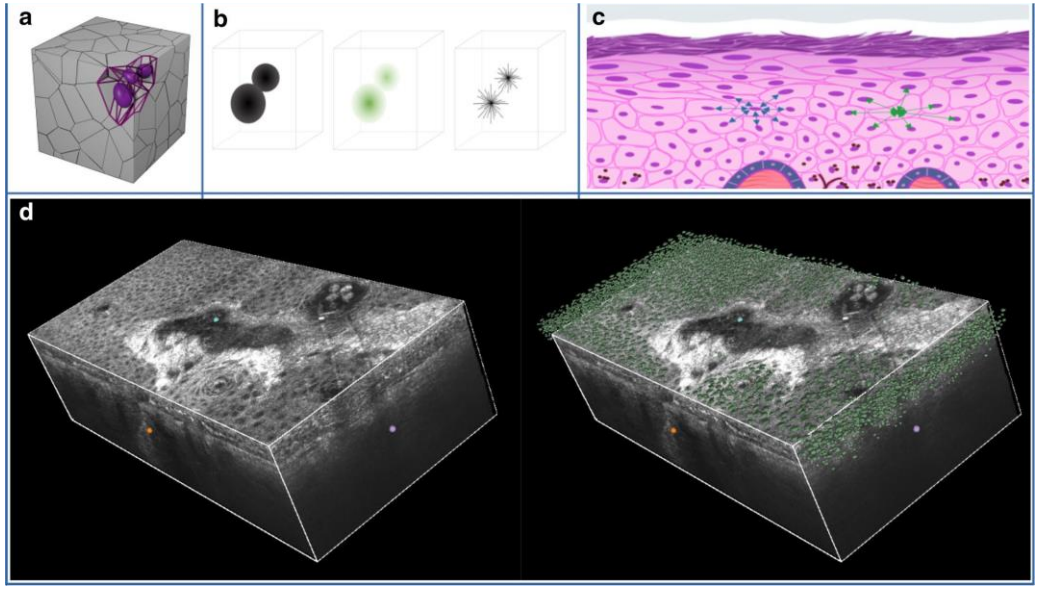
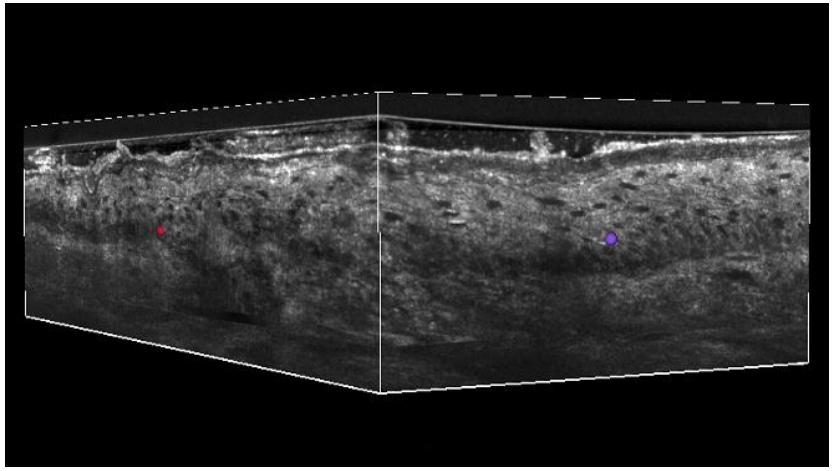
Non-invasive scoring of cellular atypia in keratinocyte cancers in 3D LC-OCT images using Deep Learning

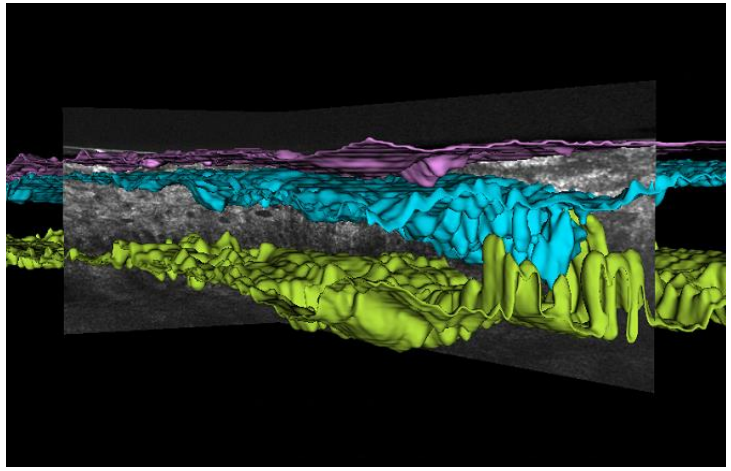
Sébastien Fischman[1]✉, Javiera Pérez-Anker[2,3], Linda Tognetti[4], Angelo Di Naro[4], Mariano Suppa[5,6,7], Elisa Cinotti[4,6], Théo Viel[1], Jilliana Monnier[6,8], Pietro Rubegni[4], Véronique del Marmol[5], Josep Malvehy[2,3], Susana Puig[2,3], Arnaud Dubois[9] & Jean-Luc Perrot[10]



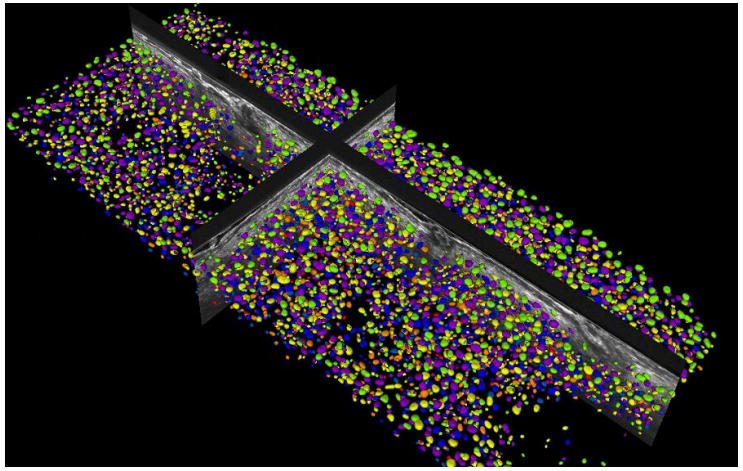




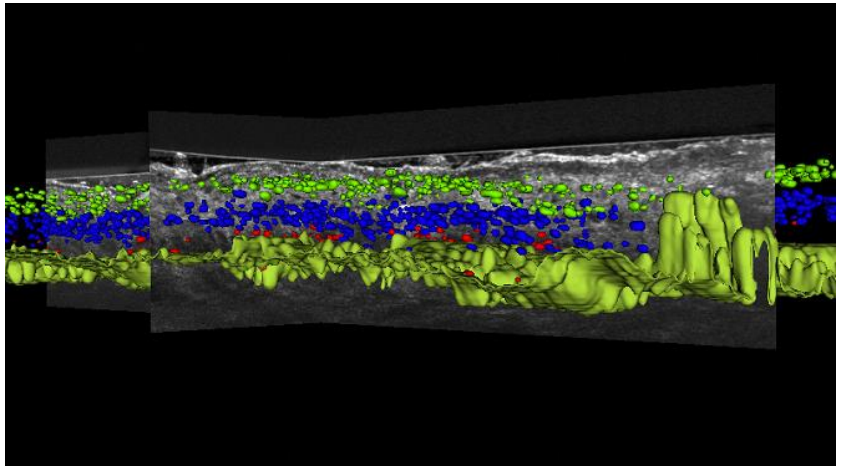




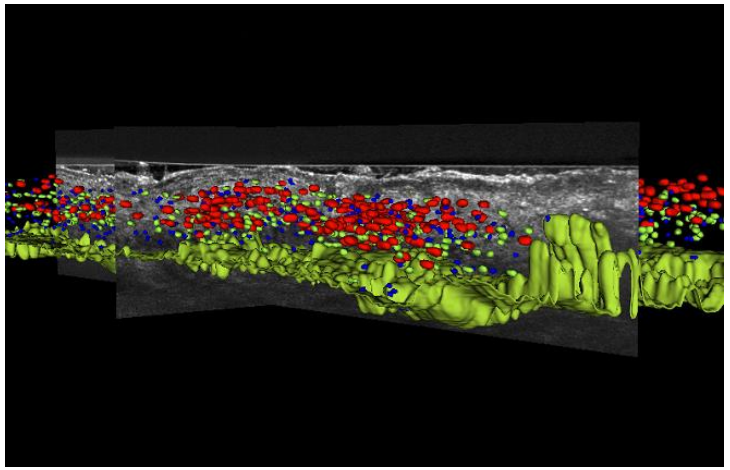
Skin layers segmentation



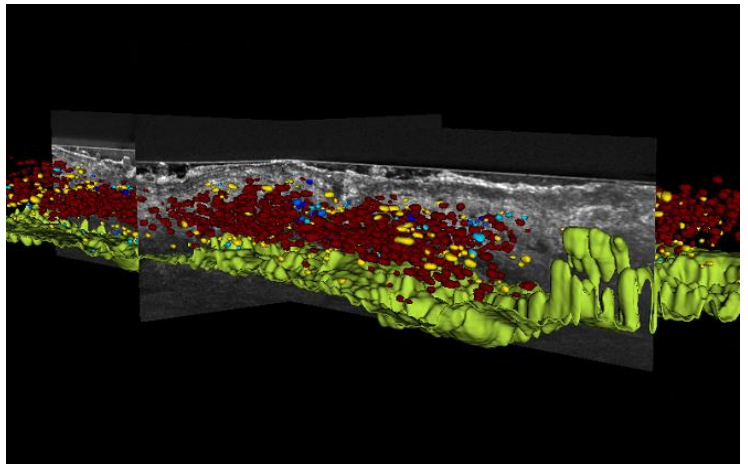
Nuclei per layers (3D)
Green: 1st top layer / Blue: middle layer /
Red: bottom layer



Nuclei per layers (3D)
Green: 1st top layer
Blue: middle layer
Red: bottom layer

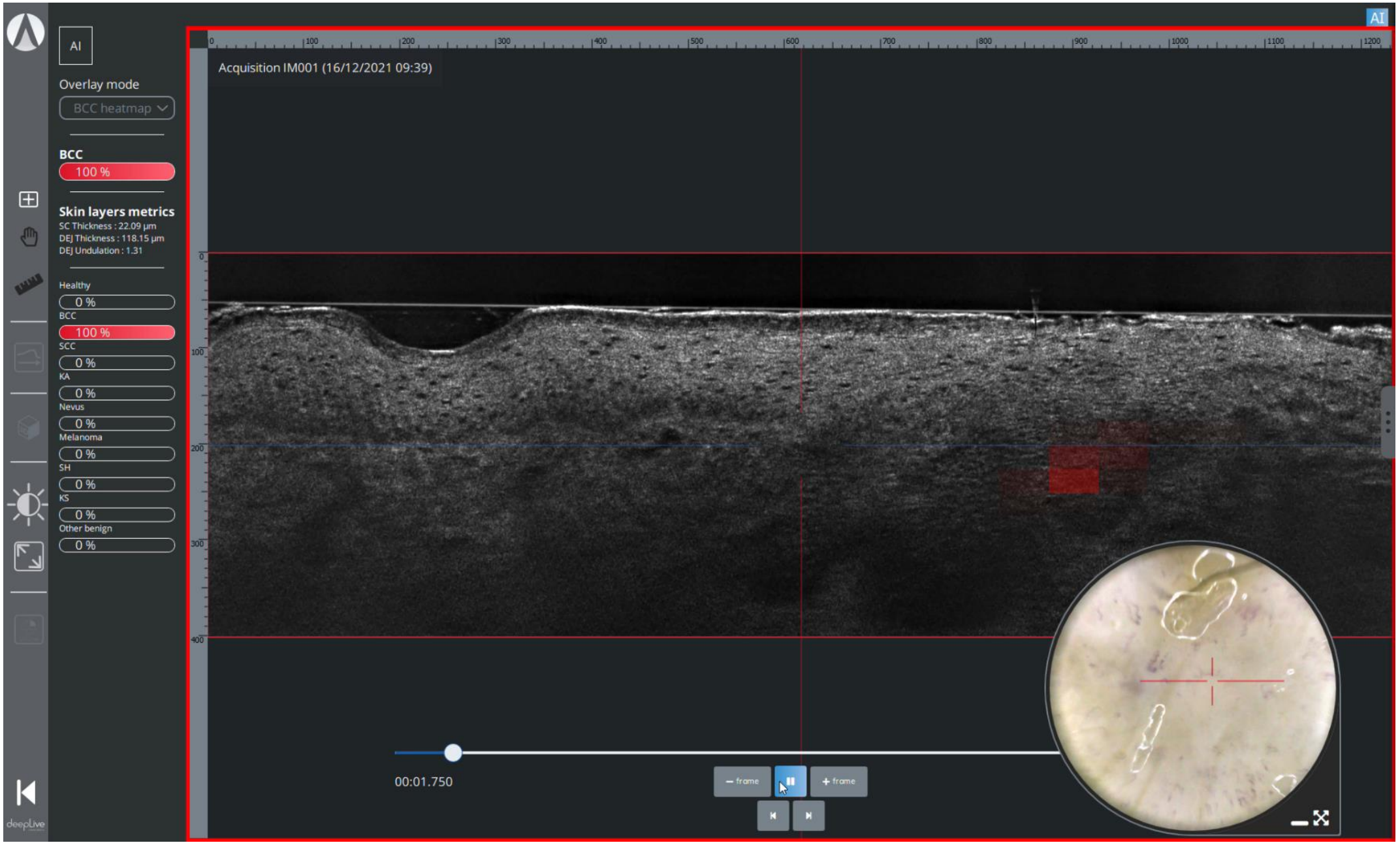


Nuclei per size (volume)
red: largest nuclei
Green: intermediate
blue: smallest

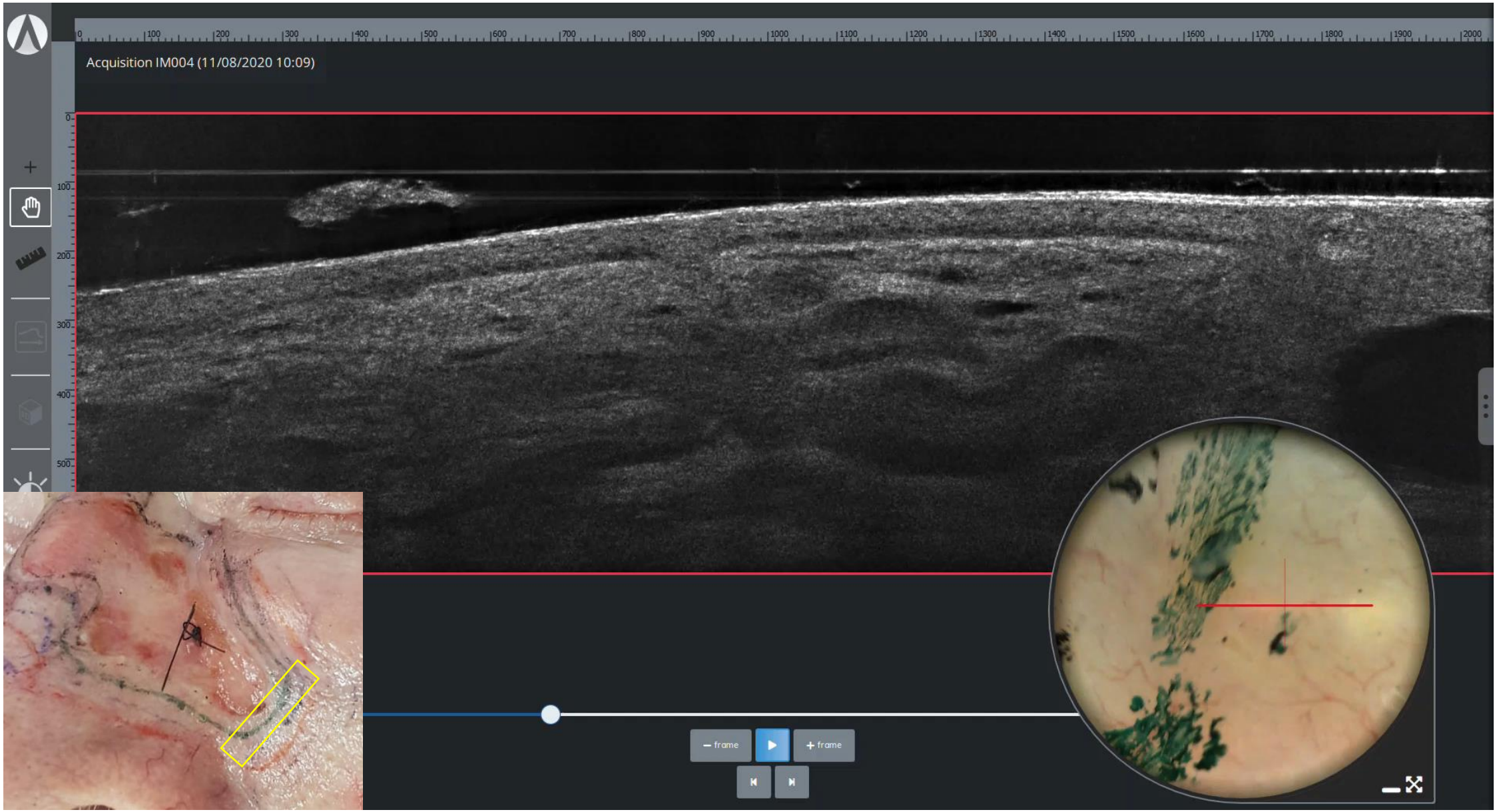


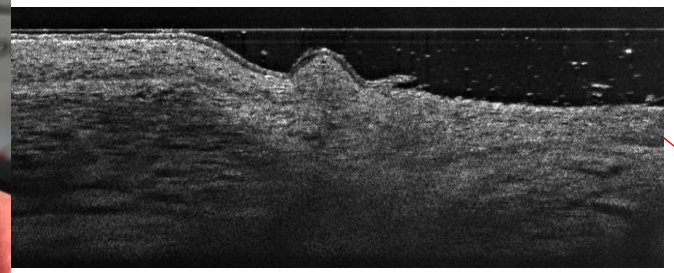
Nuclei per atypia (AI score)
red: highest atypia
Green/yellow: intermediate
blue: smallest atypia

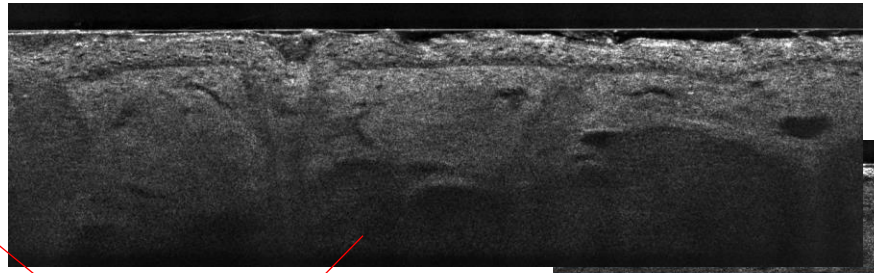
AI DETECTION OF BCC

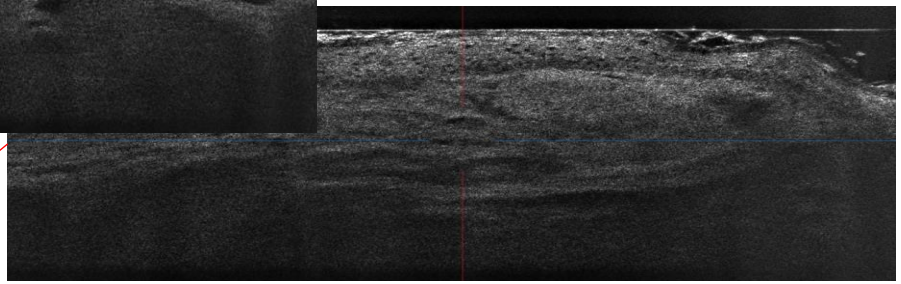


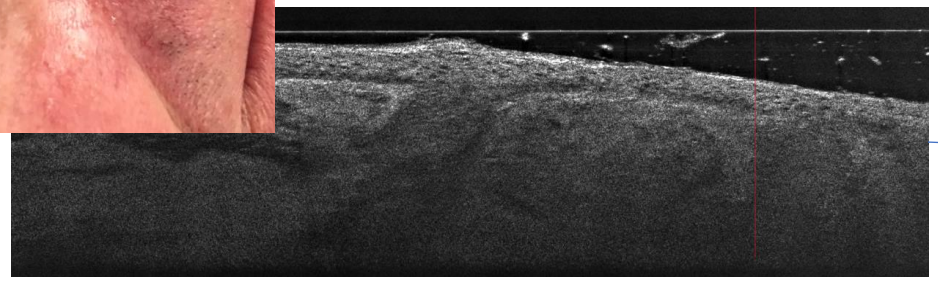
PRE-SURGICAL MARGINS ASSESSMENT

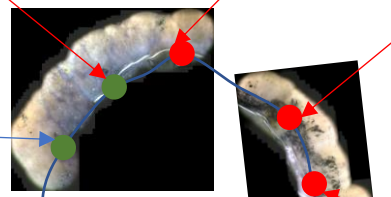


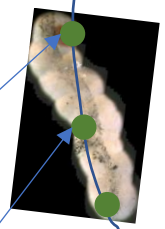


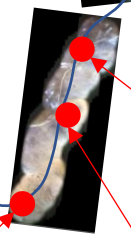


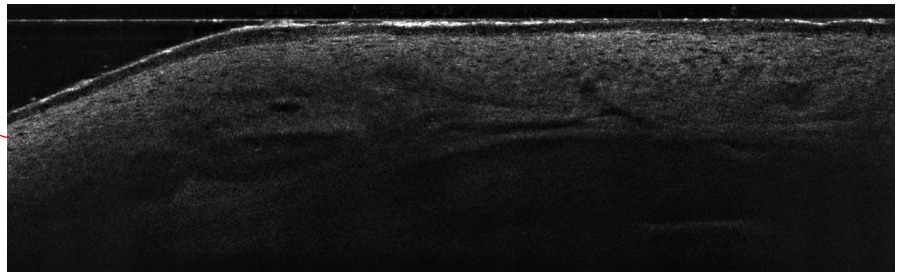


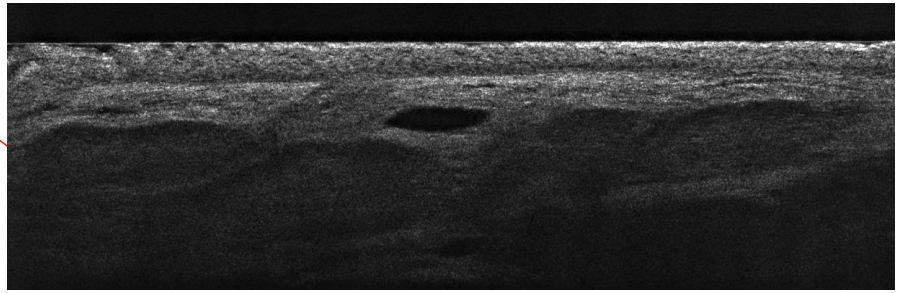


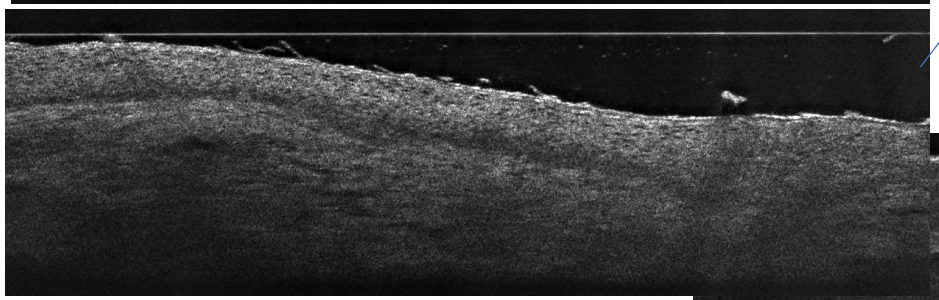


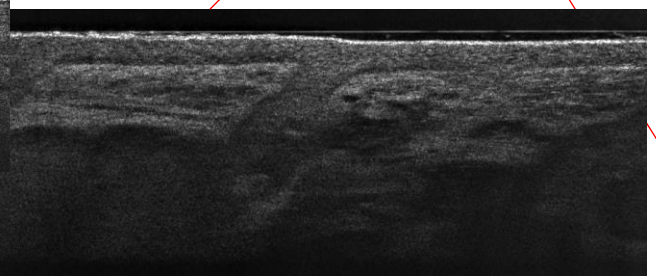


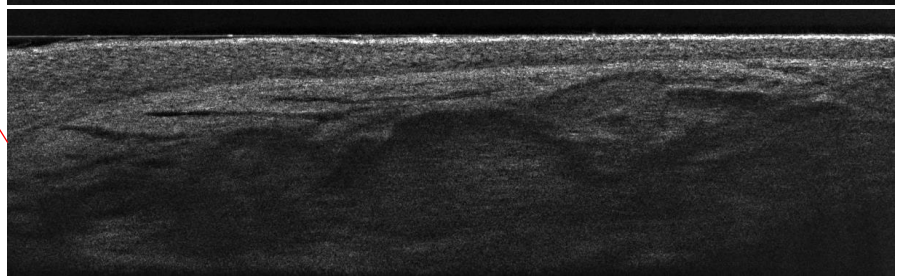


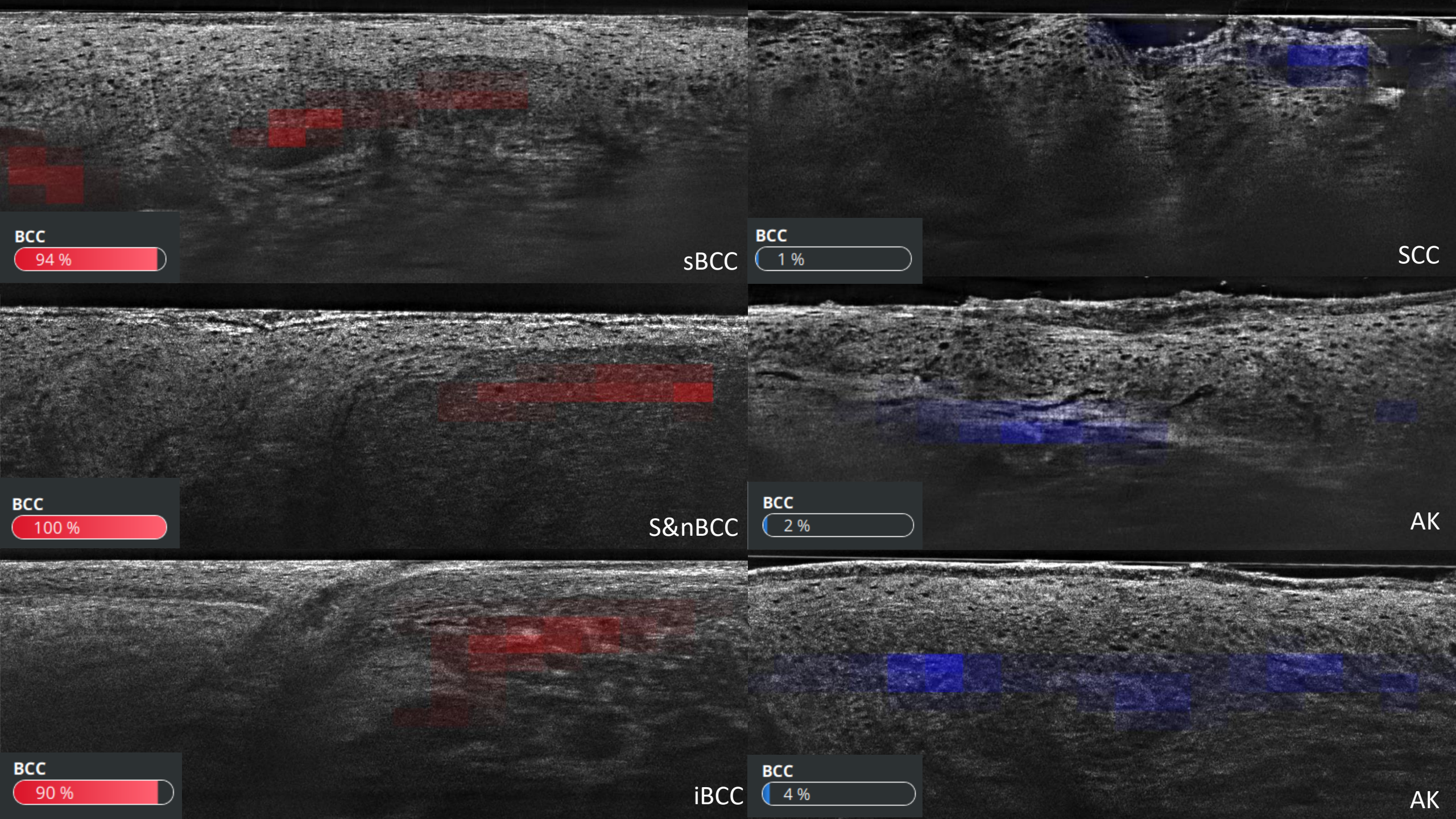






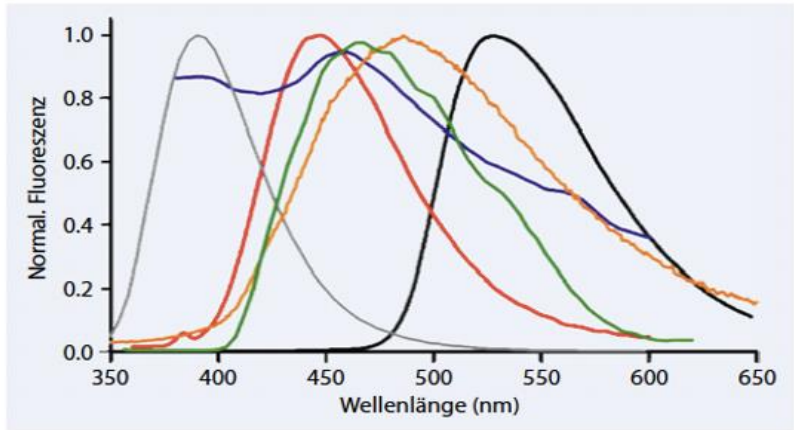


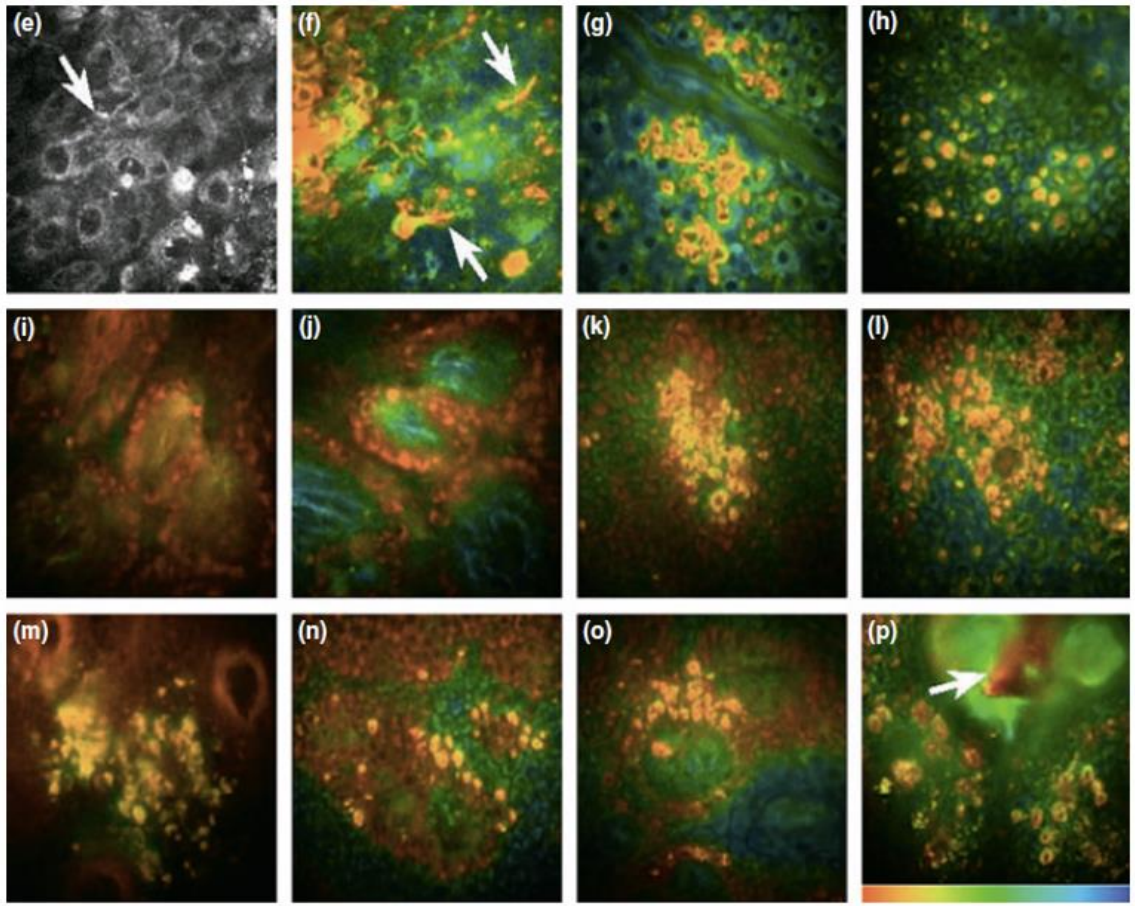



BCC
94 %
sBCC
BCC
1 %
SCC
BCC
100 %
S&nBCC
BCC
2 %
AK
BCC
90 %
iBCC
BCC
4 %
AK

Multiphoton tomography

- Simultaneous excitation of endogenous fluorophores by two or more photons of low energy in the NIR

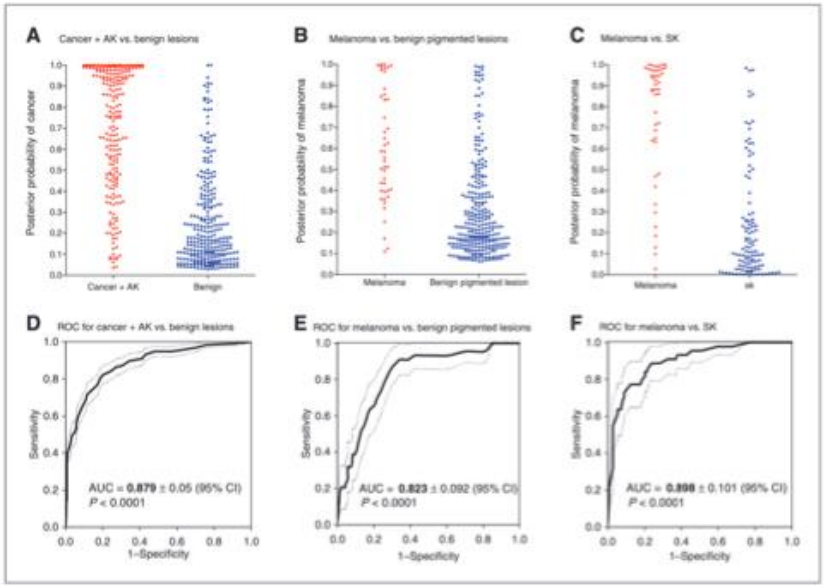


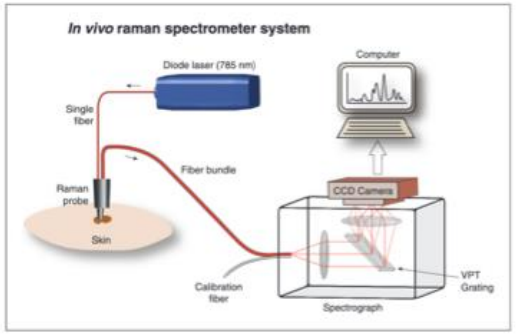


M. Kaatz, K. König. Multiphotonenmikroskopie und In-vivo-Multiphotonentomographie in der dermatologischen Bildgebung. Hautarzt 2010
Federica Arginelli et al. High resolution diagnosis of common nevi by multiphoton laser tomography and fluorescence lifetime imaging. Skin res and technol 2013

RAMAN in skin cancer

- IR and Raman spectroscopy provide details regarding the chemical composition and molecular structure of substances in cells and biological tissues, and they are considered to be vibrational spectroscopic techniques.
- IR spectroscopy measures absorbed radiation, and can serve as a visualization tool to aid the pathologist in evaluating tissue specimens

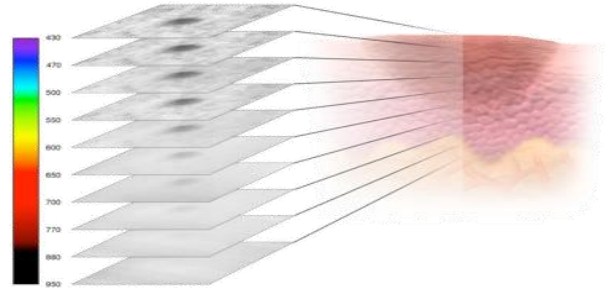


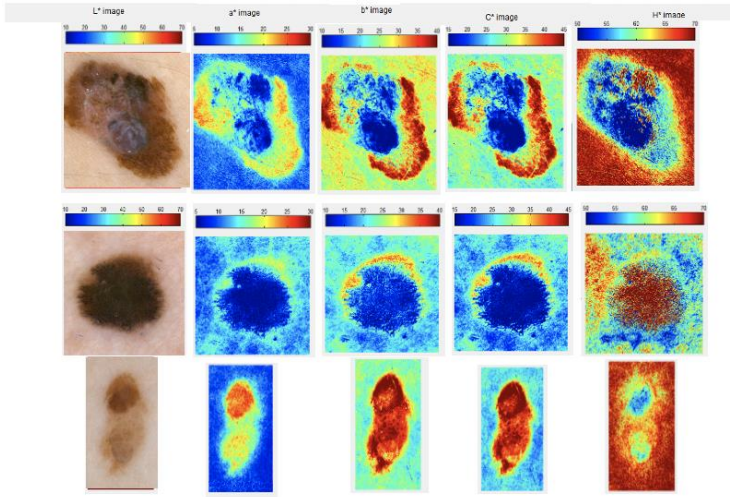


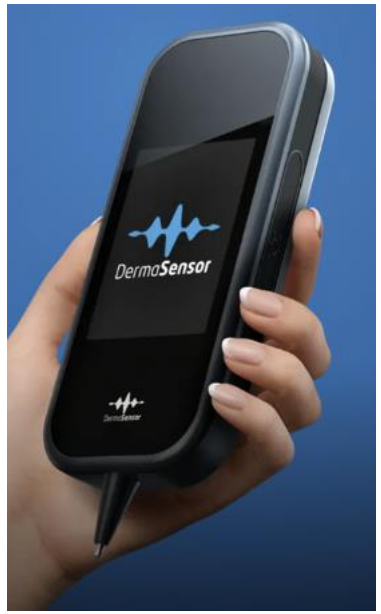
Krafft C, Sergo V. Biomedical applications of Raman and infrared spectroscopy to diagnose tissues. Spectroscopy. 2006;20(5–6): 195–218
Lui H, Zhao J, McLean D, Zeng H. Real-time Raman spectroscopy for in vivo skin cancer diagnosis. Cancer Res. 2012 May 15;72(10):2491-500.

Multispectral analyses of skin cancer

With the goal of diagnosing skin cancer in an early and noninvasive way, an extended near infrared multispectral imaging system can be used to evaluate deeper skin layers thanks to the higher penetration of photons at these wavelengths.



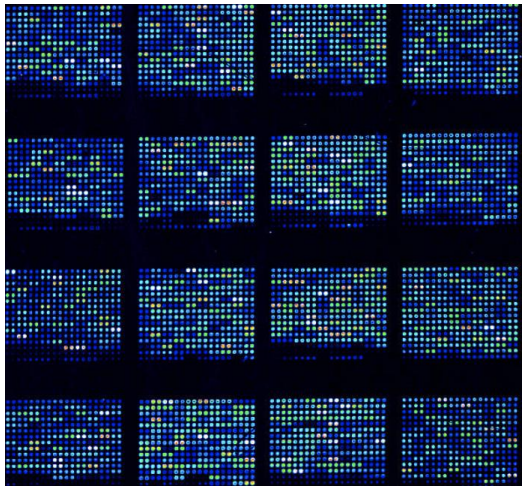


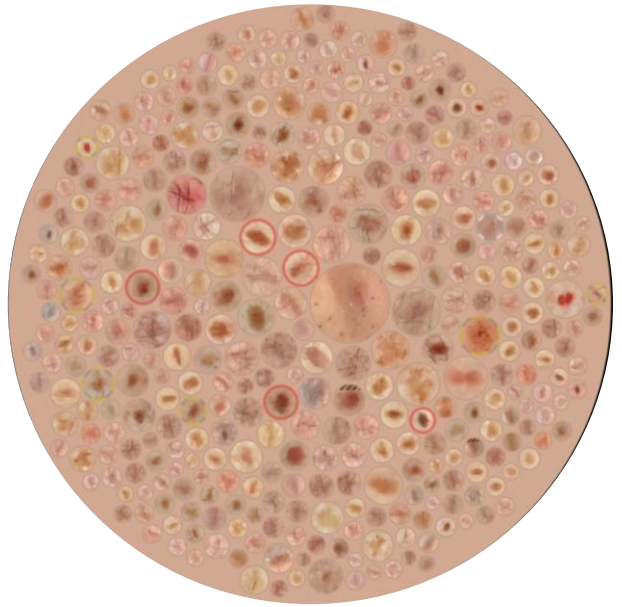


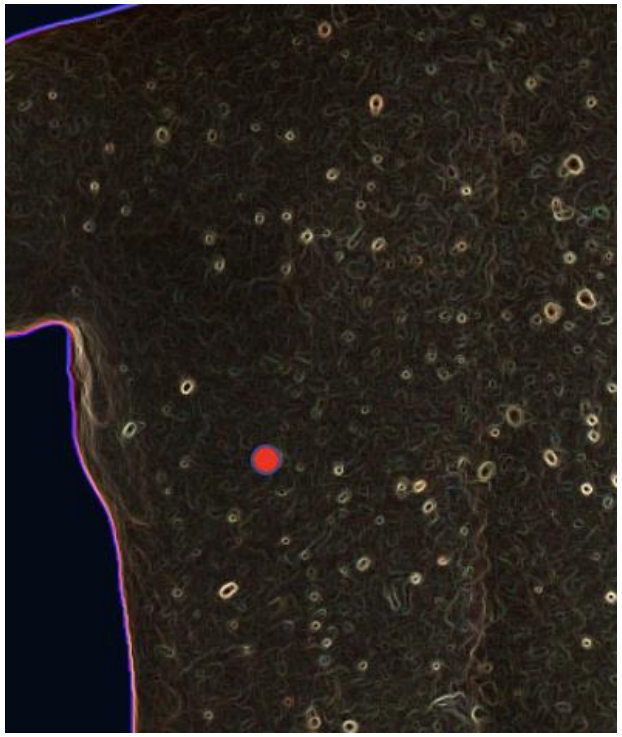
- Visual interpretation
- Computer vision analysis

Delpueyo X, Vilaseca M, Royo S, Ares M, Rey-Barroso L, Sanabria F, Puig S, Pellacani G, Noguero F, Solomita G, Bosch T. Multispectral imaging system based on light-emitting diodes for the detection of melanomas and basal cell carcinomas: a pilot study. J Biomed Opt. 2017 Jun 1;22(6):65006.
Rey-Barroso L, Burgos-Fernández FJ, Delpueyo X, Ares M, Royo S, Malvehy J, Puig S, Vilaseca M. Visible and Extended Near-Infrared Multispectral Imaging for Skin Cancer Diagnosis. Sensors (Basel). 2018 May 5;18(5):1441.


lista de trabajo
0 / 28 imágenes
0
0
23
0
0
4
filtrar por estado
21/06/2024
Familial melanoma
Atypical mole syndrome
Multiple melanoma (Feb and June 2023)

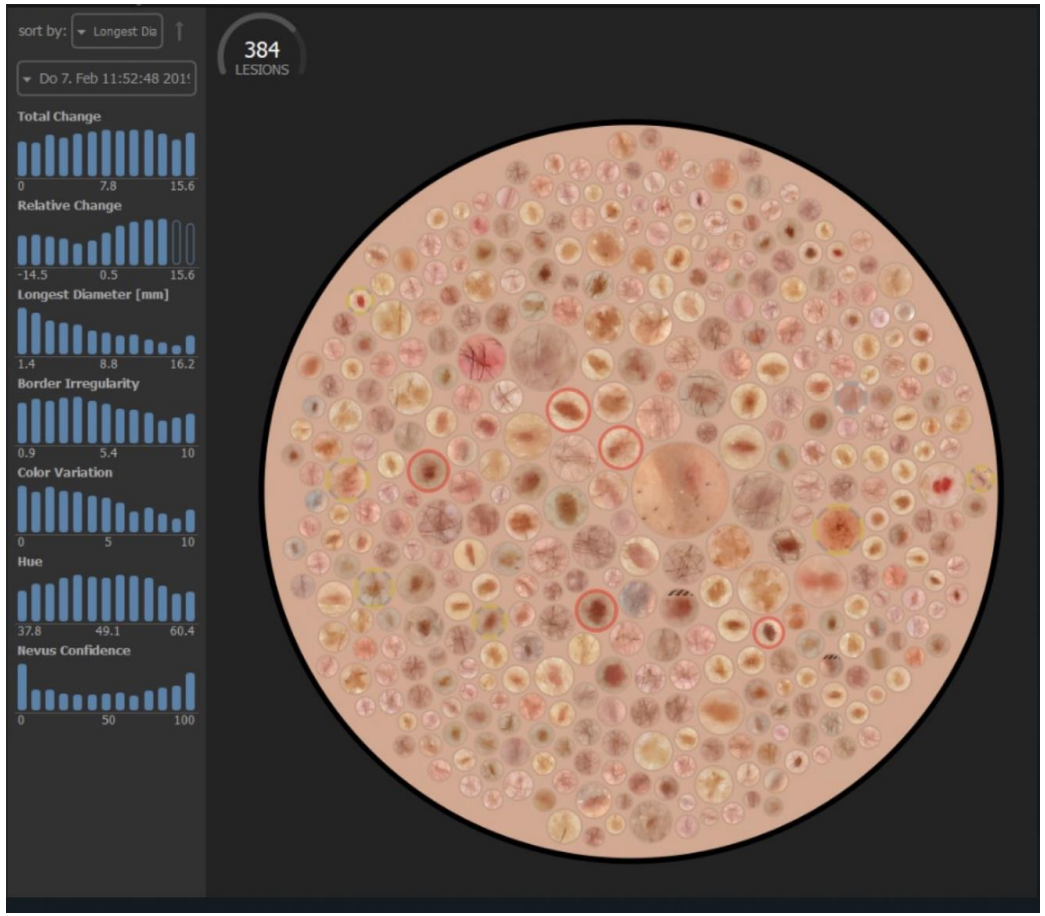






TOTAL BODY SCANNERS

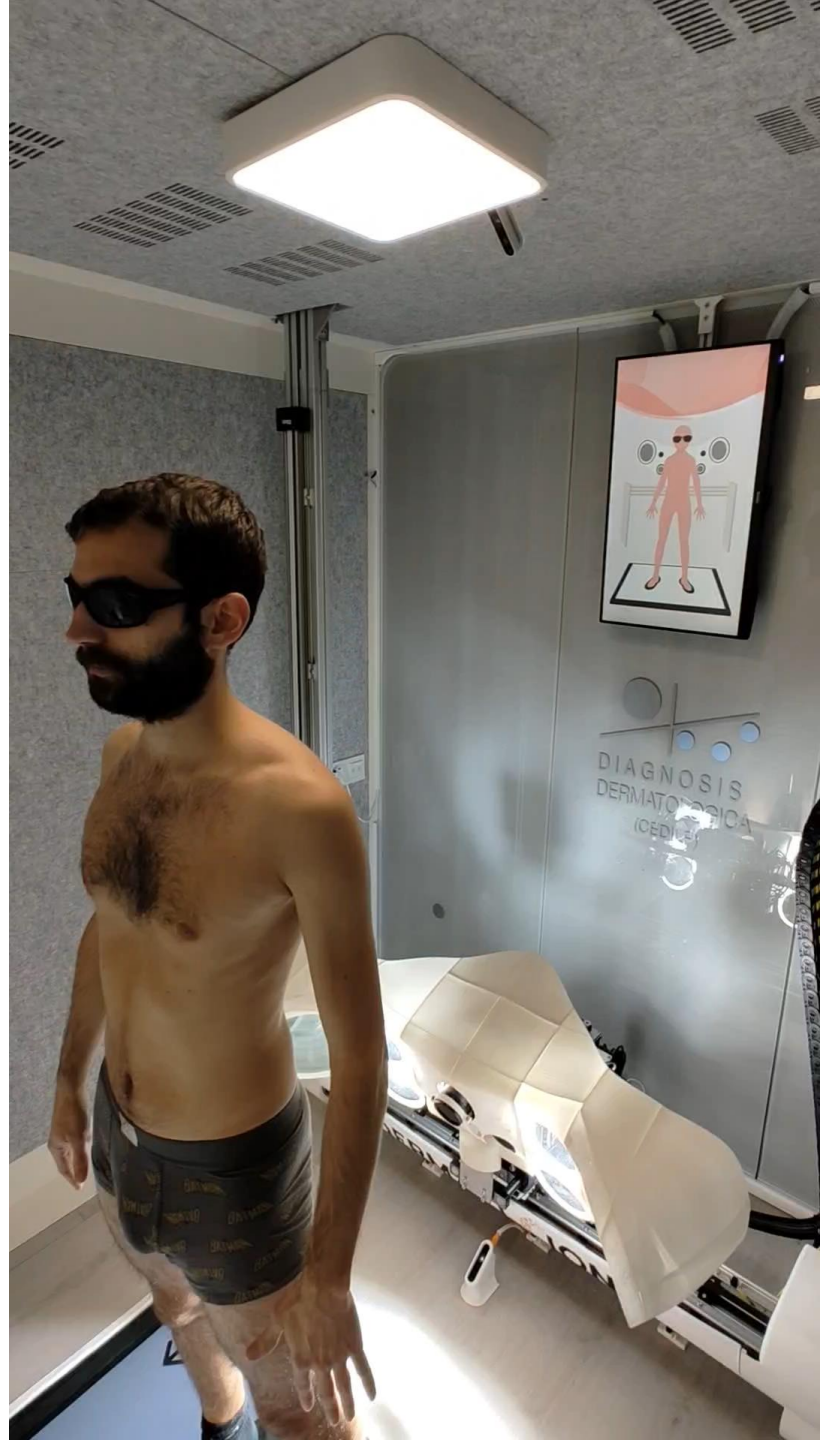
3D TOTAL BODY PHOTOGRAPHY

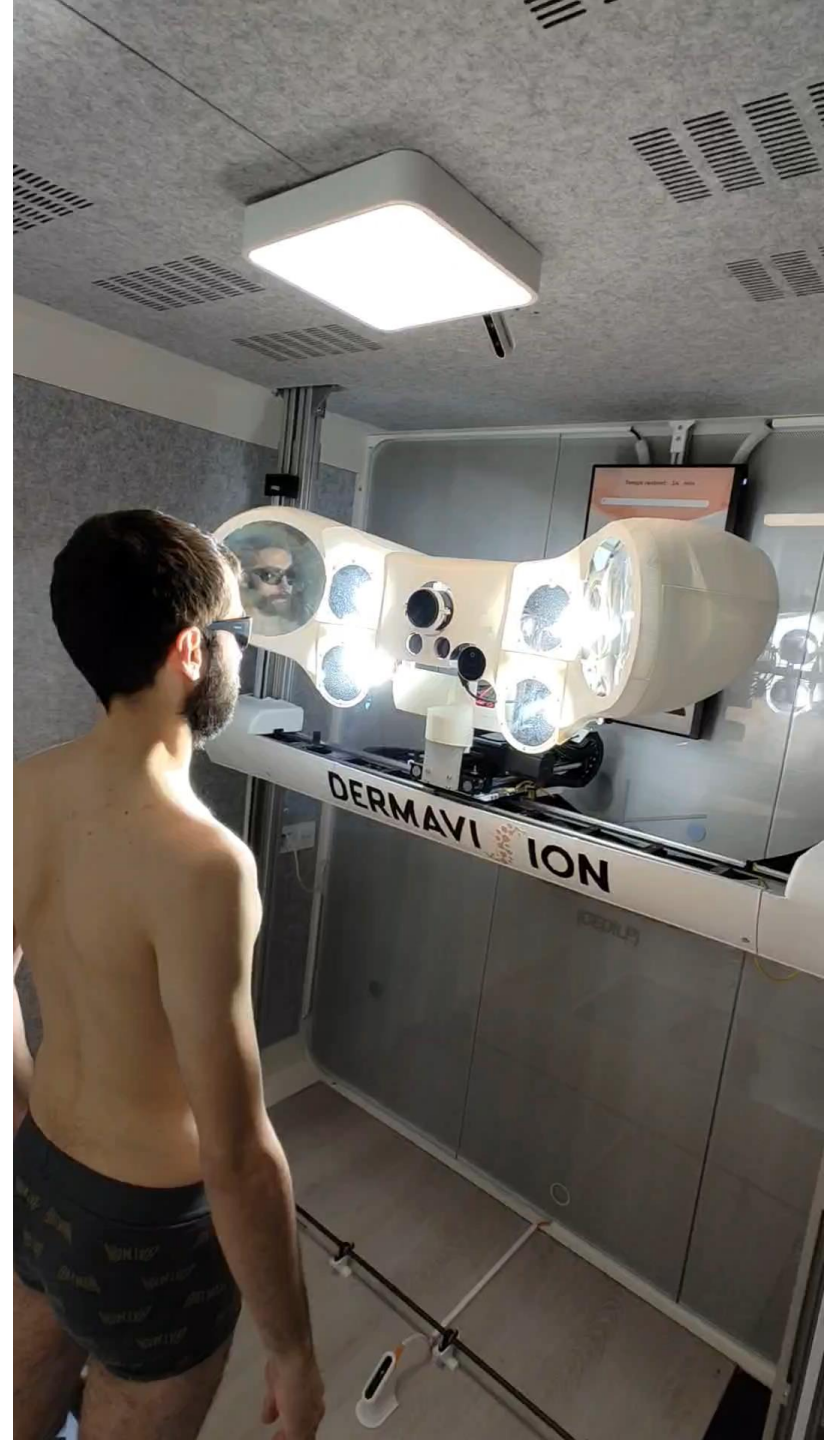


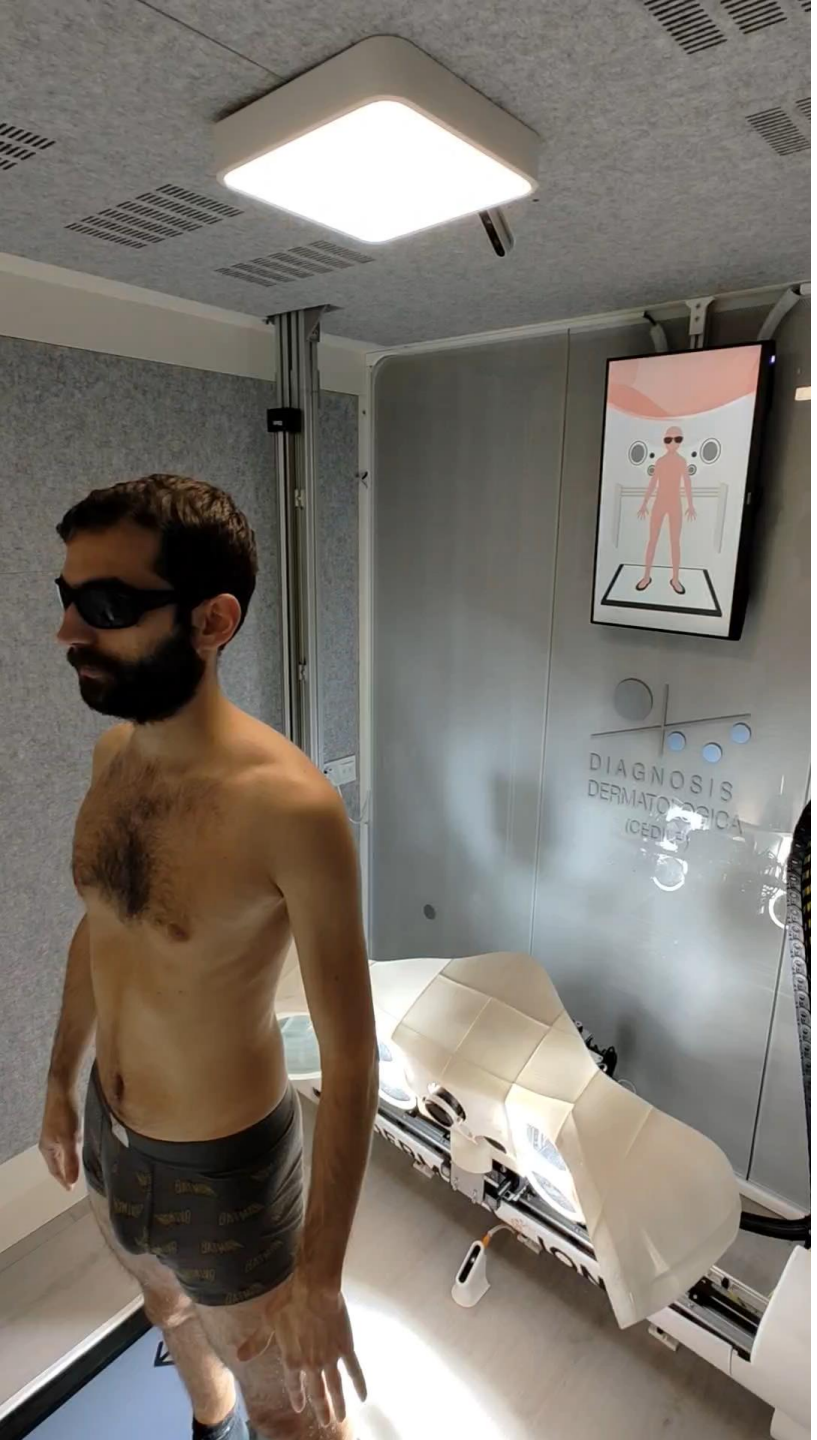
92 stereo cameras; polarised light; whole body 3D imaging system captures the entire skin surface in macro quality resolution with a single capture.

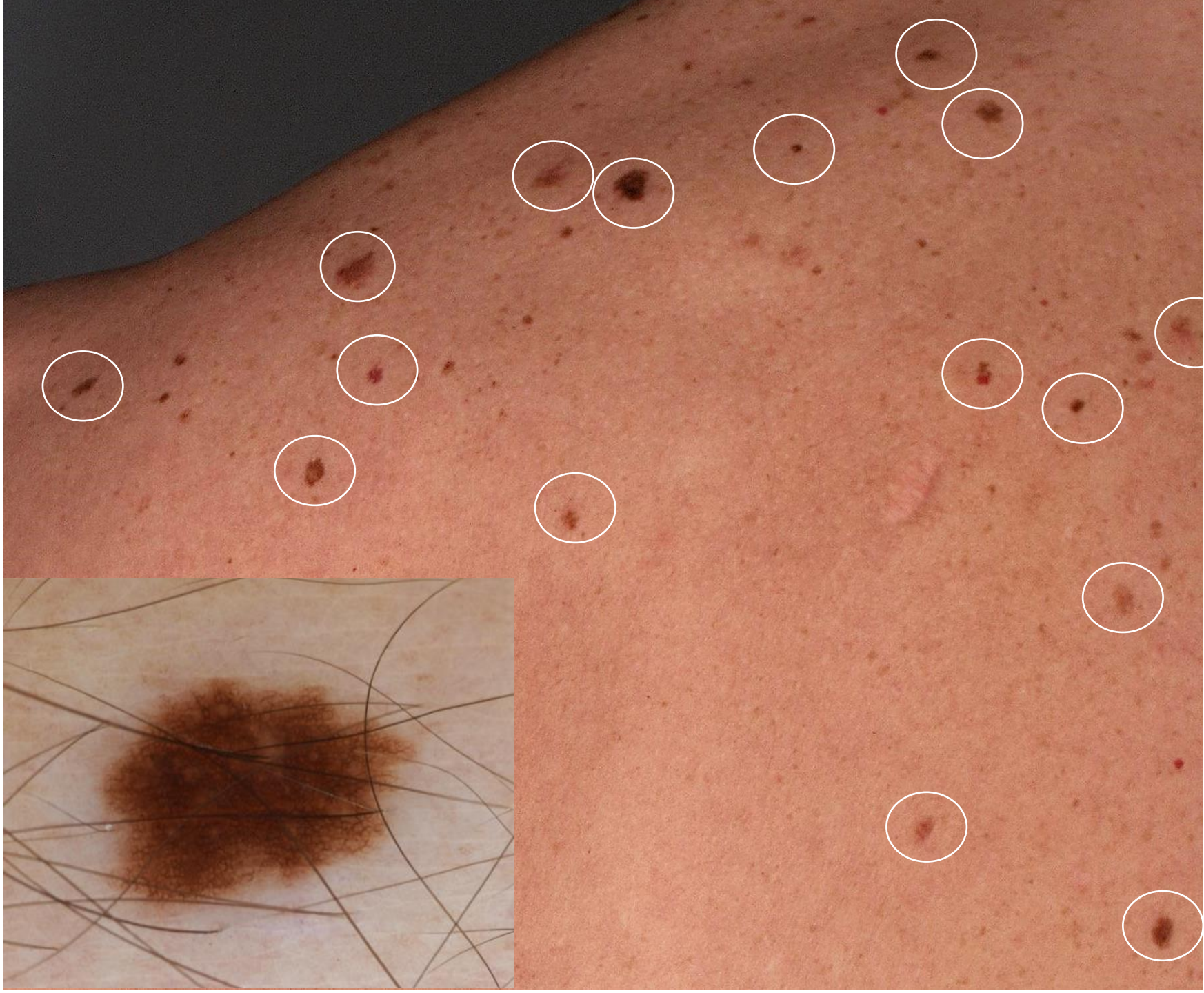
30 minuts

Source: 30 minuts (3cat). IA: la nova evolució

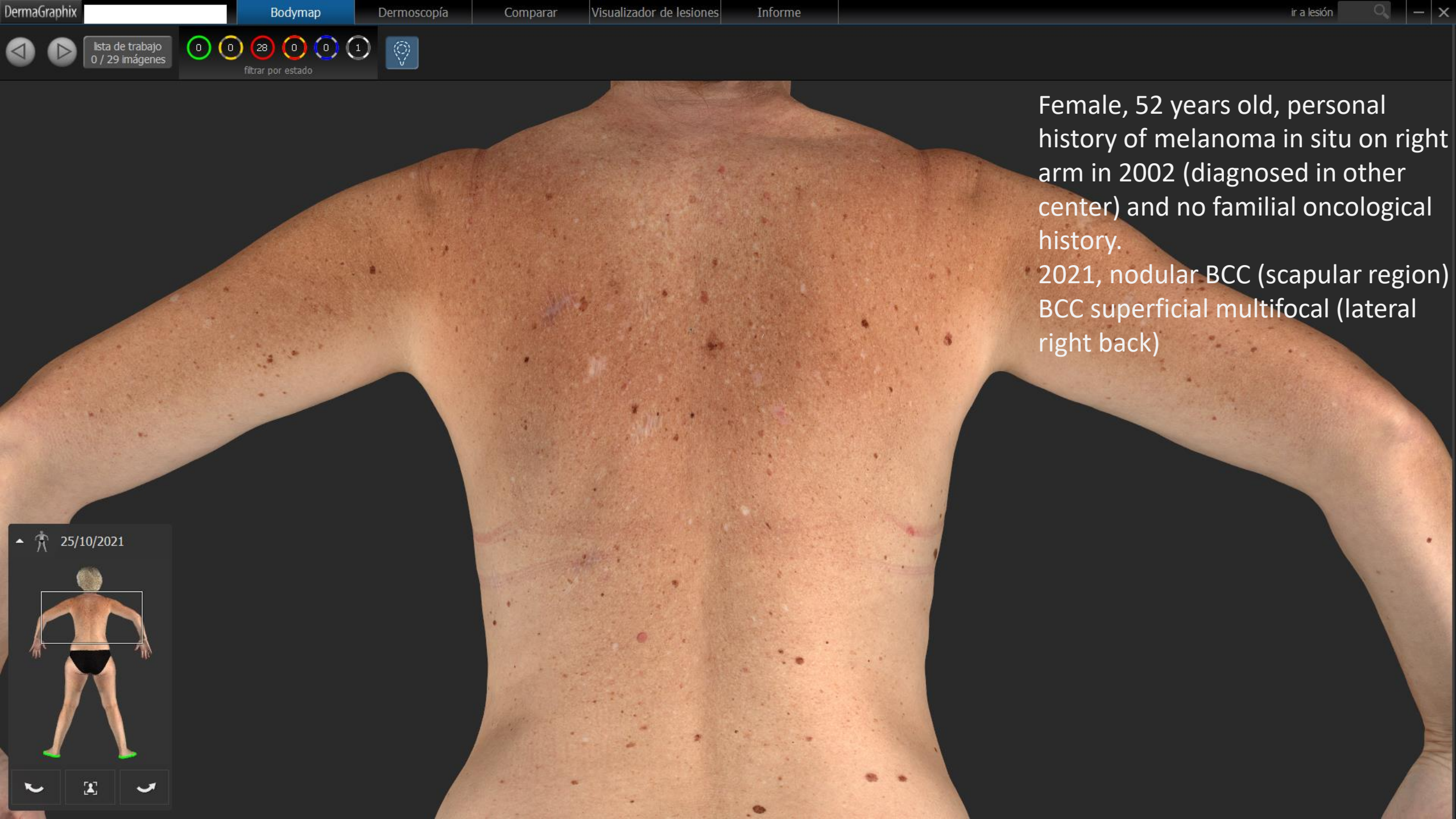

DIAGNOSIS

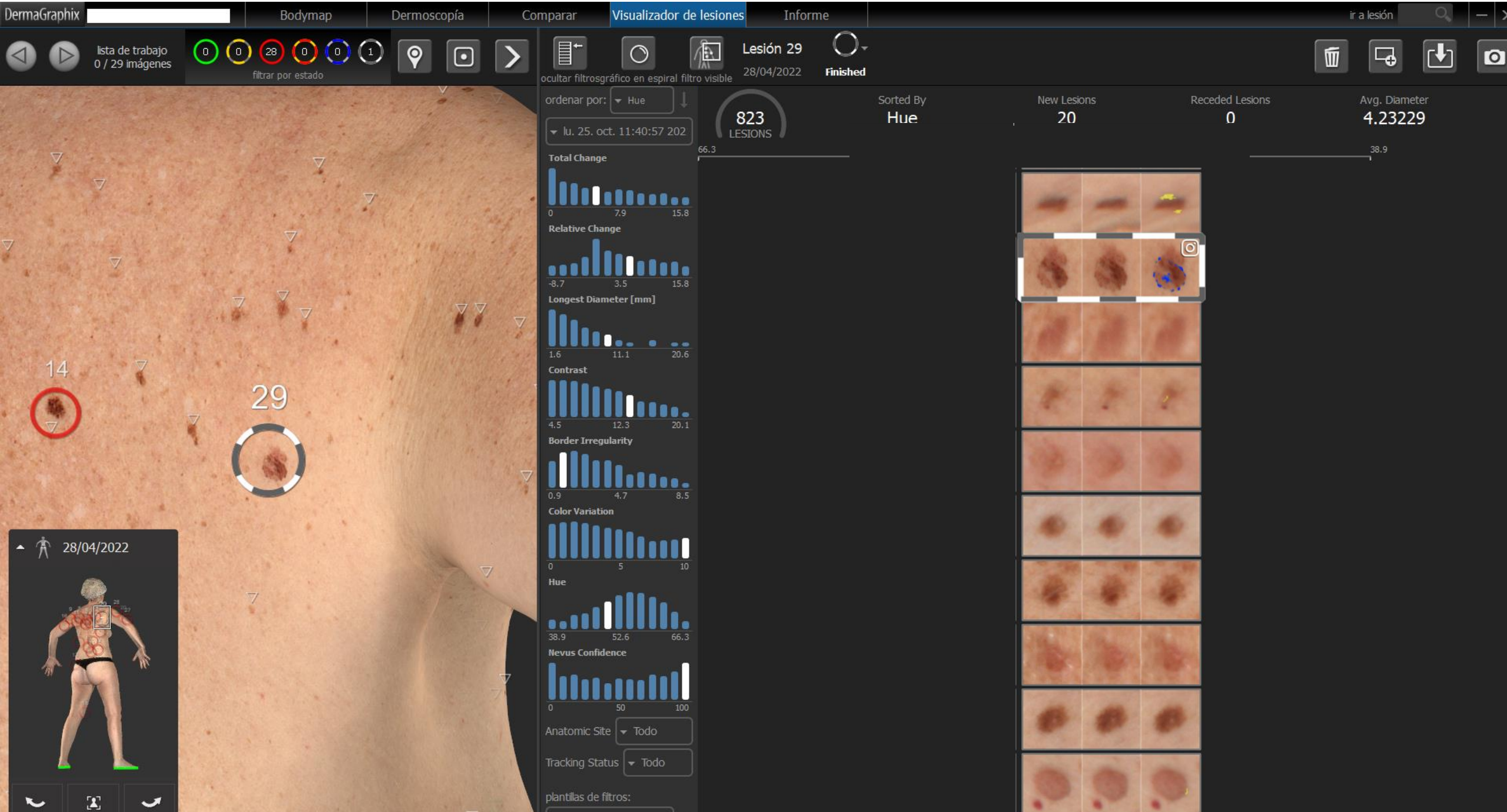

DERMAVI ION


DIAGNOSIS




DermaGraphix
Bodymap
Dermoscopy
Compare
Lesion Visualizer
Report
go to lesion
work list
0 / 5 images
0 0 5 0 0 0
filter by status
hide filters
histogram
filter visible
Auto
sort by:
Longest Diame
single timepoint
503
LESIONS
Longest Diameter [mm]
1.9
6.7
11.5
Contrast
3
11.5
19.9
Border Irregularity
0.8
5.1
9.4
Color Variation
0
5
10
Hue
31.8
47.6
63.3
Nevus Confidence
0
50
100
Anatomic Site
All
filter templates:
Property
Value
Longest Diameter [mm]
9.26
Contrast
12.97
Border Irregularity
2.25
Color Variation
9.10
Hue
48.81
Nevus Confidence
89.74
Anatomic Site
Torso Back
2
1
1 cm


DermaGraphix
Bodymap
Dermoscopía
Comparar
Visualizador de lesiones
Informe
ir a lesión
lista de trabajo
0 / 29 imágenes
0
0
28
0
0
1
filtrar por estado
25/10/2021
Female, 52 years old, personal history of melanoma in situ on right arm in 2002 (diagnosed in other center) and no familial oncological history.
2021, nodular BCC (scapular region)
BCC superficial multifocal (lateral right back)

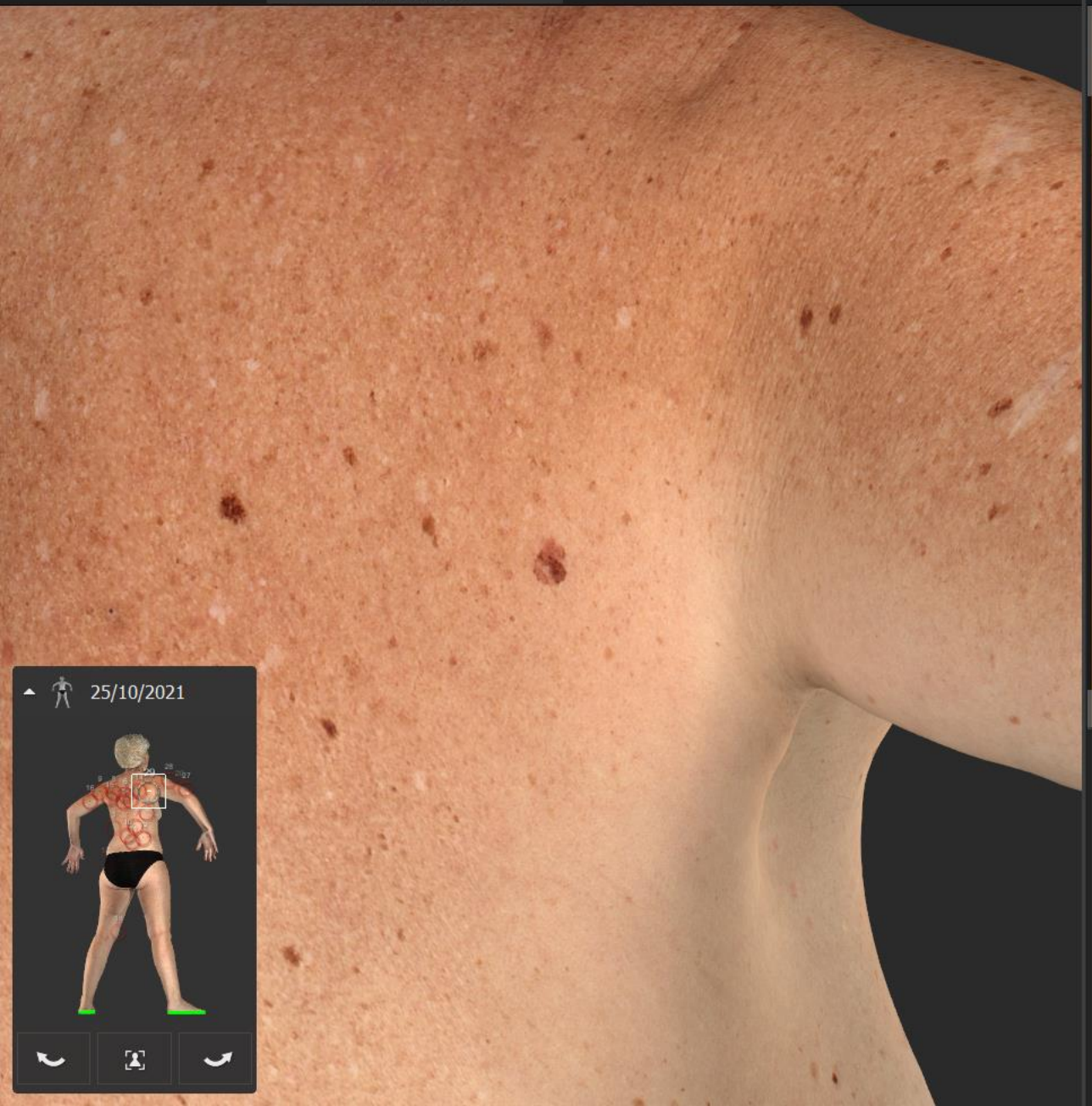

DermaGraphix
Bodymap
Dermoscopía
Comparar
Visualizador de lesiones
Informe
ir a lesión
lista de trabajo
0 / 29 imágenes
0 0 28 0 0 1
filtrar por estado
ocultar filtros
gráfico en espiral
filtro visible
Lesión 29
28/04/2022
Finished
ordenar por: Hue
lu. 25. oct. 11:40:57 202
823
LESIONS
Sorted By
Hue
New Lesions
20
Receded Lesions
0
Avg. Diameter
4.23229
66.3
38.9
Total Change
0 7.9 15.8
Relative Change
-8.7 3.5 15.8
Longest Diameter [mm]
1.6 11.1 20.6
Contrast
4.5 12.3 20.1
Border Irregularity
0.9 4.7 8.5
Color Variation
0 5 10
Hue
38.9 52.6 66.3
Nevus Confidence
0 50 100
Anatomic Site
Todo
Tracking Status
Todo
plantillas de filtros:
14
29
28/04/2022

lista de trabajo
0 / 29 imágenes

0 0 28 0 0 1
filtrar por estado

Lesión 29
28/04/2022
Finished

15X
clara
polarización



28/04/2022 10:02:57

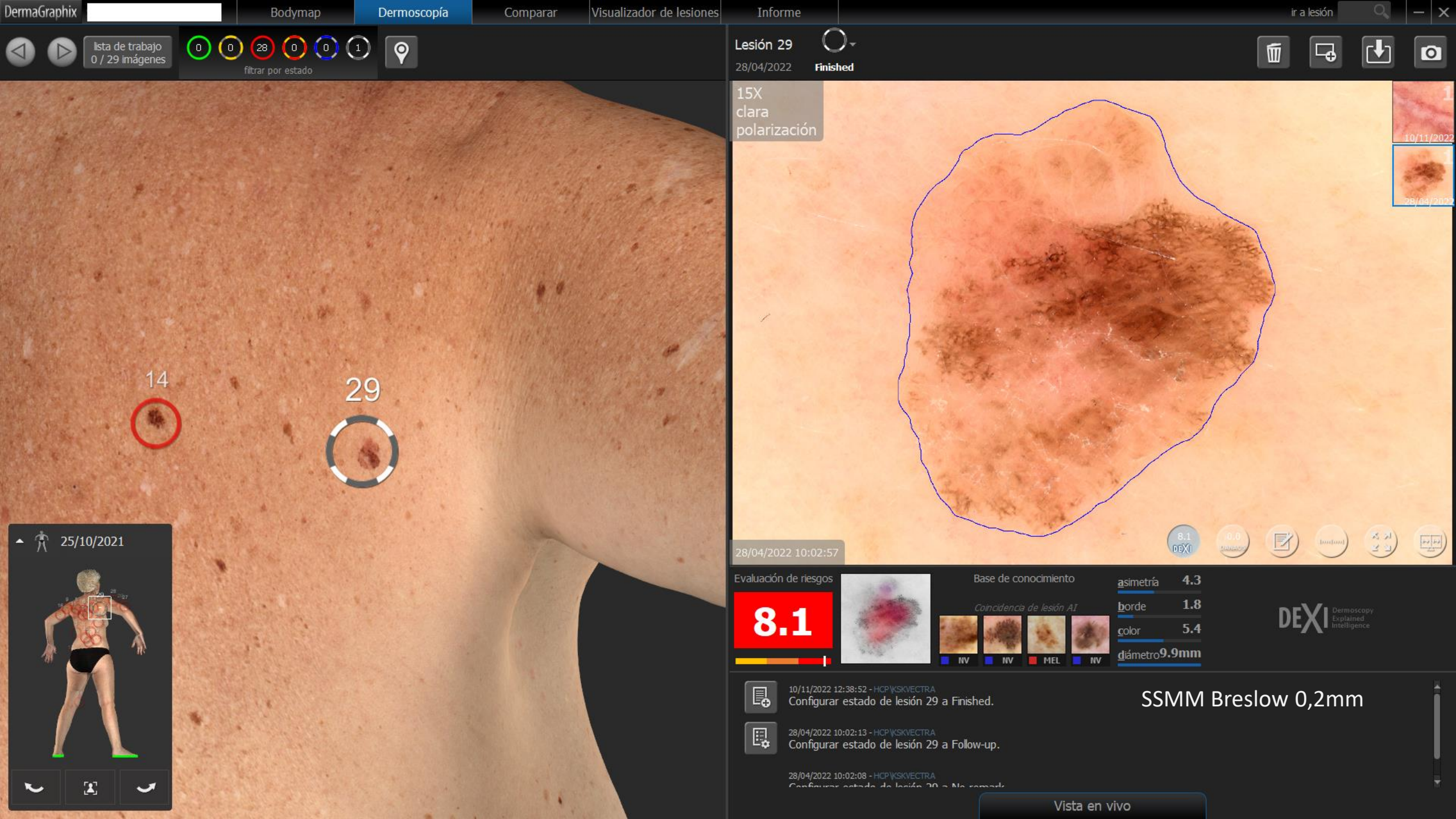
25/10/2021

10/11/2022 12:38:52 - HCP\KSKVECTRA
Configurar estado de lesión 29 a Finished.

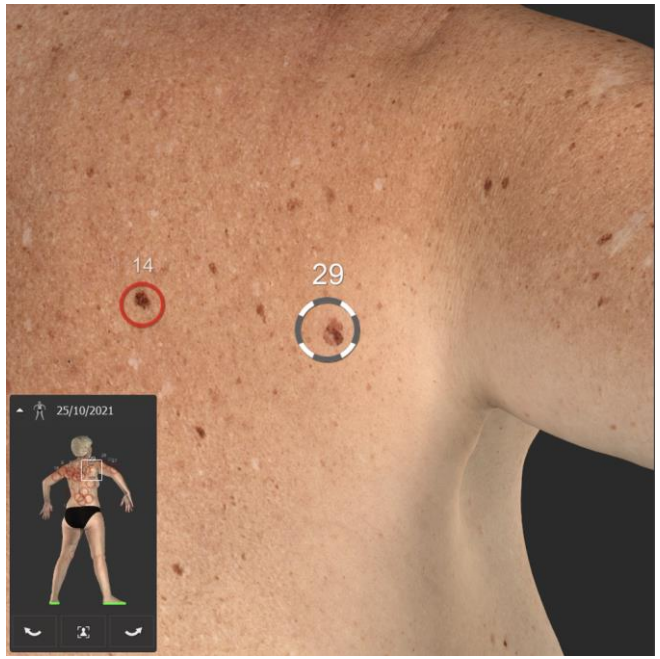
28/04/2022 10:02:13 - HCP\KSKVECTRA
Configurar estado de lesión 29 a Follow-up.

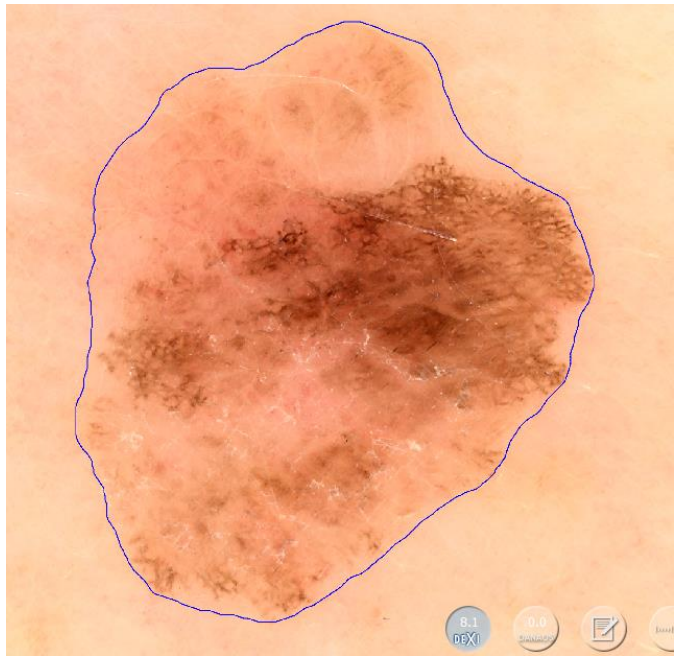
28/04/2022 10:02:08 - HCP\KSKVECTRA
Configurar estado de lesión 29 a No remark.
Configurar nombre de lesión como 29.

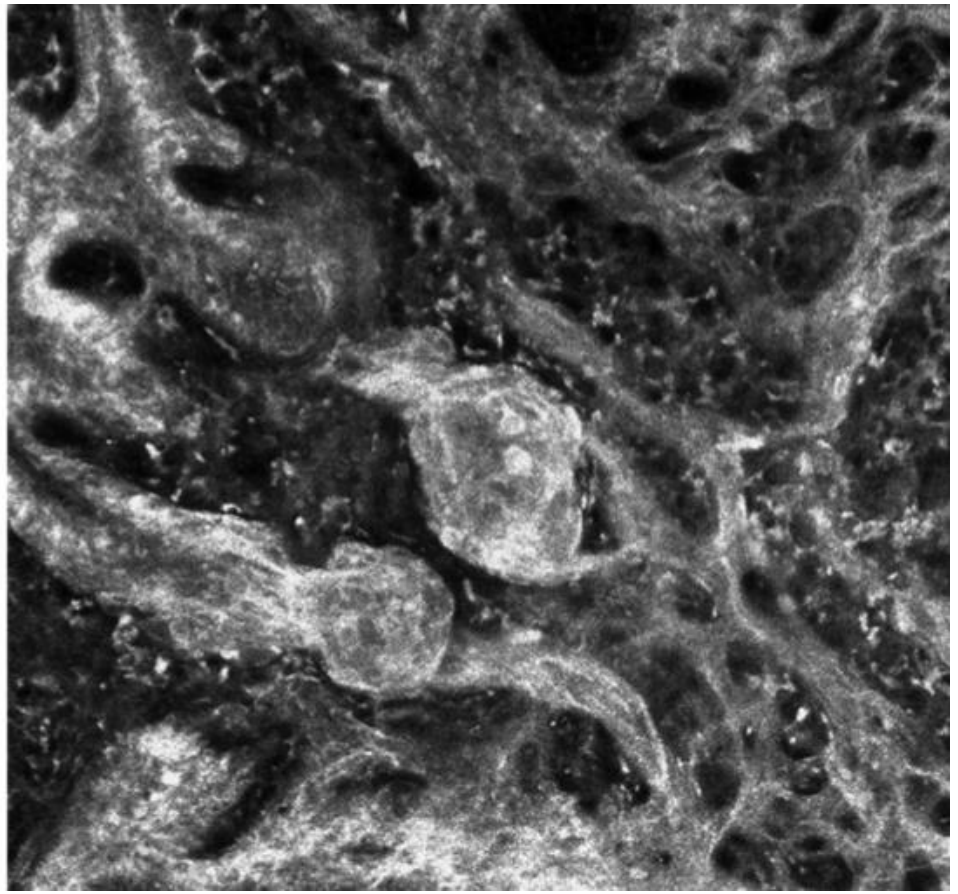
Vista en vivo

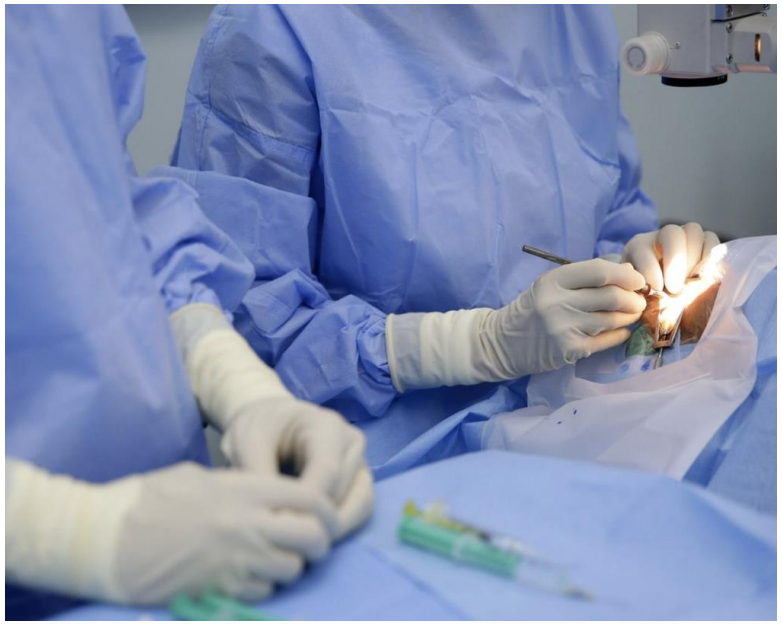

DermaGraphix
Bodymap
Dermoscopía
Comparar
Visualizador de lesiones
Informe
ir a lesión
lista de trabajo
0 / 29 imágenes
0 0 28 0 0 1
filtrar por estado
Lesión 29
28/04/2022
Finished
15X
clara
polarización
10/11/2022
28/04/2022
14
29
25/10/2021
28/04/2022 10:02:57
Evaluación de riesgos
8.1
Base de conocimiento
Coincidencia de lesión AI
NV
NV
MEL
NV
asimetría 4.3
borde 1.8
color 5.4
diámetro 9.9mm
DEXI Dermoscopy Explained Intelligence
10/11/2022 12:38:52 - HCP\KSKVECTRA
Configurar estado de lesión 29 a Finished.
28/04/2022 10:02:13 - HCP\KSKVECTRA
Configurar estado de lesión 29 a Follow-up.
28/04/2022 10:02:08 - HCP\KSKVECTRA
SSMM Breslow 0,2mm
Vista en vivo

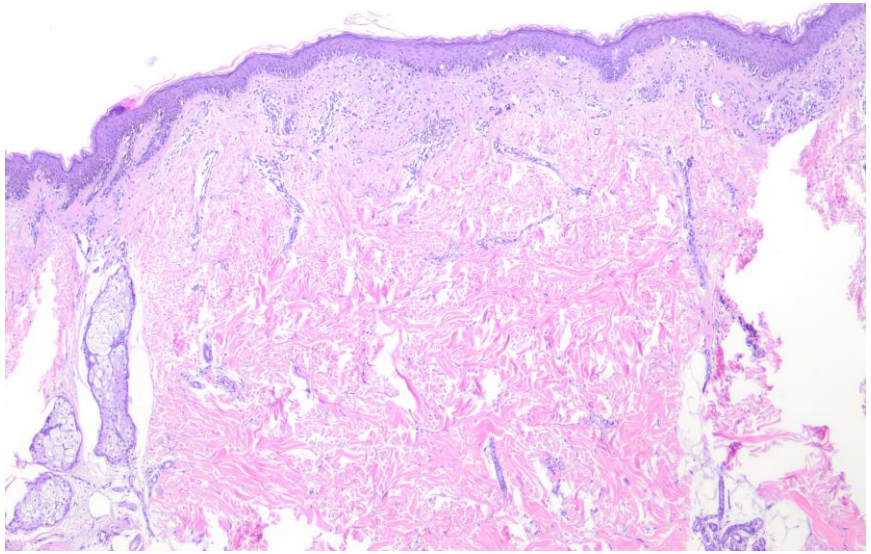
Skin cancer diagnostics: workflow of patients

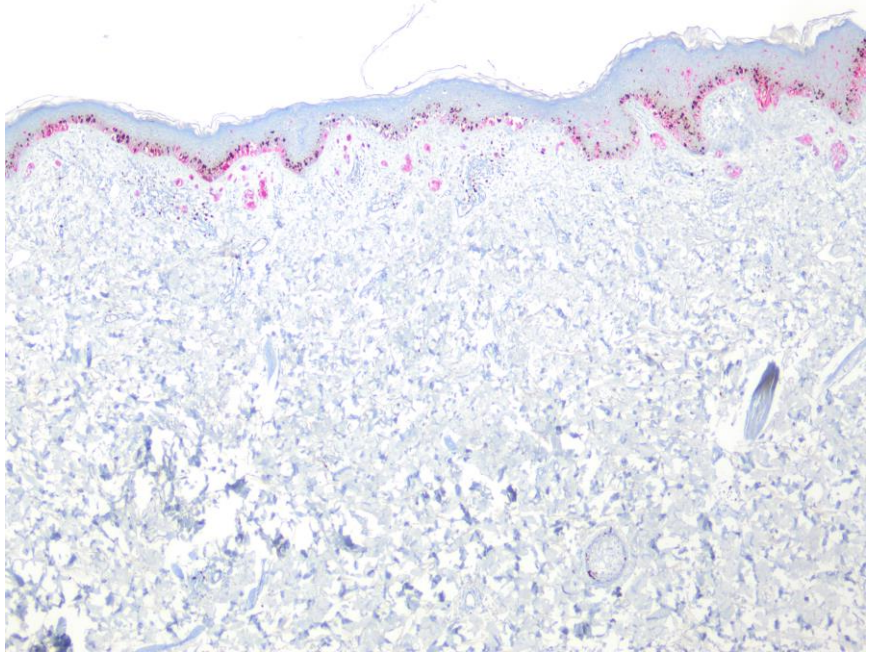












MMSS 0,2 mm Breslow, 0 mit /mm2, III Clark.

Intelligent Total Body Scanner for Early Detection of Melanoma

AI-based tools to provide holistic risk assessment for individual lesions, and risk stratification of patients to assist clinicians in monitoring for skin cancer.

Consortium

The iToBoS project involves **partners from 13 countries**: Spain (5), Germany (3), France (2), Switzerland (1), Israel (1), Belgium (1), Greece (1), Ireland (1), Italy (1), UK (1), Hungary (1), Sweden (1) and Australia (1). For 48 months we will work to get the expected results for the benefit of scientific research.

The University of Queensland has received funding from the Australia's NHMRC under grant number APP2007014.

Metadata
Demographics, Previous History of Skin Cancer, Sun Exposure and Health Factors, Phenotype and genetic Information

Metadata anonymisation

Images
TBP and dermoscopic images

Image anonymisation

500 patients of various risk profiles are recruited from two clinical sites (Australia and Spain)

iTOBOs Cloud

Image pre-annotation by HITers Annotation Software V7's Darwin platform

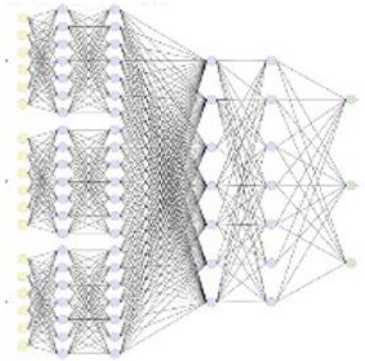
Image Annotation for Diagnostic Categories by dermatologists

Selection of lesions
Skin phenotype annotation (Sun Damage, distribution of nevi, skin colour)

Data set of annotated images and metadata

Machine learning HOLISTIC RISK SCORE

XAI (explainable AI) methods

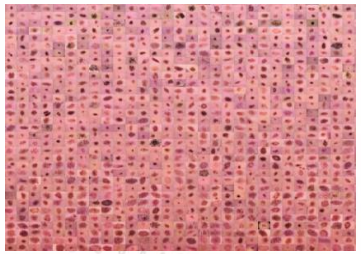


Risk stratification of individuals

Individual lesions risk score

iToBOS

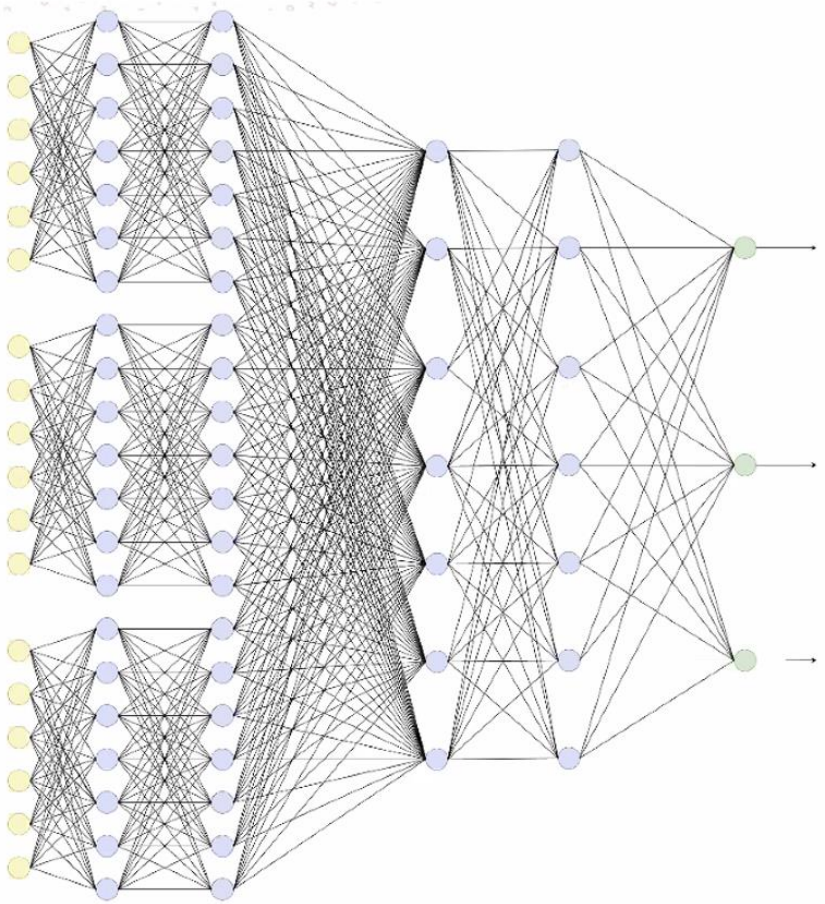
*Publicly released dataset of anonymised annotated TBP images will be used for an international challenge to foster use and development of new algorithms



Image

Medical Records

Genomics



Biomarker Discovery
Diagnostics

Holistic Risk Score

Risk of individual lesions

Risk of the patient

Diagnostic of skin cancer in 2034

RCT

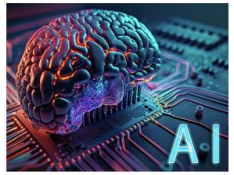
Health Economics

+

Self screening
(Apps)

Automated screening

+



e-Health, AI

+

Nurses, GPs,
Derms, Others

Dermatologist at referral centers
High technology

Imaging biomarkers: screening, risk, diagnostic, prognostic, predictive

Deeper cellular resolution, molecular analyses, photonic nanotechnology, drug delivery....

CONCLUSIONS

- A number of technologies using imaging and physical properties are available for skin cancer diagnosis
- New technologies with faster examination and computed aided
- The combination of Deep phenotyping with machine learning can improve detection of skin cancer and risk stratification of patients