

# From Principles to Practice: Managing a Medical Research Data Repository



Nicholas Kurtansky

Memorial Sloan Kettering Cancer Center

# Self-introduction – Nicholas Kurtansky

- MSKCC Dermatology Service
- Sr. Data Analyst
- Statistics
- 6+ years ISIC Archive admin
- Skin cancer research



Memorial Sloan Kettering  
Cancer Center

> J Invest Dermatol. 2022 Dec;142(12):3274-3281. doi: 10.1016/j.jid.2022.06.011. Epub 2022 Jul 14.

## Analyzing the Spatial Randomness in the Distribution of Acquired Melanocytic Neoplasms

Emmanouil Chousakos <sup>1</sup>, Kivanc Kose <sup>2</sup>, Nicholas R Kurtansky <sup>2</sup>, Stephen W Dusza <sup>2</sup>, Allan C Halpern <sup>2</sup>, Ashfaq A Marghoob <sup>2</sup>

## Distribution

> J Eur Acad Dermatol Venereol. 2022 Dec;36(12):2379-2387. doi: 10.1111/jdv.18470. Epub 2022 Aug 5.

### The long-term evolution of melanocytic nevi among high-risk adults

O Reiter <sup>1,2</sup>, N R Kurtansky <sup>1</sup>, S T Musthaq <sup>1</sup>, S Dusza <sup>1</sup>, A C Halpern <sup>1</sup>, M A Marchetti <sup>1</sup>, A A Marghoob <sup>1</sup>, A Scope <sup>1,2,3</sup>, V Rotemberg <sup>1</sup>

# Morphology and risk factors

> J Am Acad Dermatol. 2025 Mar;92(3):480-486. doi: 10.1016/j.jaad.2024.10.070. Epub 2024 Nov 9.

### Differentiating seborrheic keratosis from melanoma among lesions exhibiting blue-white veil: A retrospective study

Isabella N Dana <sup>1</sup>, Nicholas R Kurtansky <sup>2</sup>, Larissa M Pastore <sup>3</sup>, James R Xu <sup>4</sup>, Zaeem H Nazir <sup>5</sup>, Stephen W Dusza <sup>2</sup>, Emmanouil Chousakos <sup>6</sup>, Ofer Reiter <sup>7</sup>, Cristian Navarrete-Decent <sup>8</sup>

## Dermoscopy

> J Eur Acad Dermatol Venereol. 2021 May;35(5):1111-1118. doi: 10.1111/jdv.17133. Epub 2021 Feb 23.

### The differences in clinical and dermoscopic features between in situ and invasive nevus-associated melanomas and de novo melanomas

O Reiter <sup>1,2</sup>, N Kurtansky <sup>1</sup>, J K Nanda <sup>1</sup>, K J Busam <sup>3</sup>, A Scope <sup>1,2</sup>, S Musthaq <sup>1</sup>, A A Marghoob <sup>1</sup>

> J Eur Acad Dermatol Venereol. 2021 Apr;35(4):892-899. doi: 10.1111/jdv.17035. Epub 2020 Dec 23.

### Association between the dermoscopic morphology of peripheral globules and melanocytic lesion diagnosis

O Reiter <sup>1,2</sup>, E Chousakos <sup>1</sup>, N Kurtansky <sup>1</sup>, J K Nanda <sup>1</sup>, S W Dusza <sup>1</sup>, M A Marchetti <sup>1</sup>, N Jaimes <sup>3</sup>, A Moraes <sup>4</sup>, A A Marghoob <sup>1</sup>

# Epidemiology of melanoma

> J Invest Dermatol. 2022 Jul;142(7):1804-1811.e6. doi: 10.1016/j.jid.2021.12.003.

Epub 2021 Dec 11.

## An Epidemiologic Analysis of Melanoma Overdiagnosis in the United States, 1975–2017

Nicholas R Kurtansky <sup>1</sup>, Stephen W Dusza <sup>1</sup>, Allan C Halpern <sup>1</sup>, Rebecca I Hartman <sup>2</sup>,  
Alan C Geller <sup>3</sup>, Ashfaq A Marghoob <sup>1</sup>, Veronica M Rotemberg <sup>1</sup>, Michael A Marchetti <sup>4</sup>

> Br J Dermatol. 2022 Sep;187(3):430-432. doi: 10.1111/bjd.21251. Epub 2022 May 15.

## Risk of nonacral cutaneous melanoma after the diagnosis of acral melanoma

Nicholas R Kurtansky <sup>1</sup>, Rachel N Manci <sup>1</sup>, Danielle M Bello <sup>2</sup>, Adewole S Adamson <sup>3</sup>,  
Alexander N Shoushtari <sup>1</sup>, Mackenzie R Wehner <sup>4</sup>, Charlotte E Ariyan <sup>2</sup>, Ashfaq A Marghoob <sup>1</sup>,

# Primary diagnosis

> NPJ Digit Med. 2023 Jul 12;6(1):127. doi: 10.1038/s41746-023-00872-1.

## Prospective validation of dermoscopy-based open-source artificial intelligence for melanoma diagnosis (PROVE-AI study)

Michael A Marchetti #<sup>1</sup>, Emily A Cowen <sup>1</sup>, Nicholas R Kurtansky <sup>1</sup>, Jochen Weber <sup>1</sup>, Megan Dauscher <sup>1</sup>, Jennifer DeFazio <sup>1</sup>, Liang Deng <sup>1</sup>, Stephen W Dusza <sup>1</sup>, Helen Haliasos <sup>1</sup>, Allan C Halpern <sup>1</sup>, Sharif Hosein <sup>1</sup>, Zaeem H Nazir <sup>1</sup>, Ashfaq A Marghoob <sup>1</sup>, Elizabeth A Quigley <sup>1</sup>, Trina Salvador <sup>1</sup>, Veronica M Rotemberg #<sup>2</sup>

> Lancet Digit Health. 2022 May;4(5):e330-e339. doi: 10.1016/S2589-7500(22)00021-8.

## Validation of artificial intelligence prediction models for skin cancer diagnosis using dermoscopy images: the 2019 International Skin Imaging Collaboration Grand Challenge

Marc Combalia <sup>1</sup>, Noel Codella <sup>2</sup>, Veronica Rotemberg <sup>3</sup>, Cristina Carrera <sup>1</sup>, Stephen Dusza <sup>4</sup>, David Gutman <sup>5</sup>, Brian Helba <sup>6</sup>, Harald Kittler <sup>7</sup>, Nicholas R Kurtansky <sup>4</sup>, Konstantinos Liopyris <sup>8</sup>, Michael A Marchetti <sup>4</sup>, Sebastian Podlipnik <sup>1</sup>, Susana Puig <sup>1</sup>, Christoph Rinner <sup>9</sup>,

> J Invest Dermatol. 2025 May 29:S0022-202X(25)00539-1. doi: 10.1016/j.jid.2025.05.019. Online ahead of print.

## Noninvasive Diagnosis of Melanoma Using Machine Learning and Reflectance Confocal Microscopy

Jonathan Kentley <sup>1</sup>, Nicholas Kurtansky <sup>2</sup>, Manu Jain <sup>2</sup>, Miguel Cordova <sup>2</sup>, Jochen Weber <sup>2</sup>, Ucalene Harris <sup>2</sup>, Anabel Alfonso <sup>2</sup>, Allan C Halpern <sup>2</sup>, Veronica Rotemberg <sup>2</sup>,

> J Am Coll Surg. 2024 Jan 1;238(1):23-31. doi: 10.1097/XCS.0000000000000886. Epub 2023 Oct 23.

## Clinical Utility of Melanoma Sentinel Lymph Node Biopsy Nomograms

Harrison M Drebin <sup>1</sup>, Sharif Hosein <sup>2</sup>, Nicholas R Kurtansky <sup>2</sup>, Emily Nadelmann <sup>2</sup>, Andrea P Moy <sup>3</sup>, Charlotte E Ariyan <sup>1</sup>, Danielle M Bello <sup>1</sup>, Mary S Brady <sup>1</sup>, Daniel G Coit <sup>1</sup>,

> Ann Surg Oncol. 2025 Mar;32(3):1463-1472. doi: 10.1245/s10434-024-16698-4. Epub 2024 Dec 16.

## Declining Clinical Utility of Tools for Predicting Sentinel Lymph Node Biopsy Status: A Single Institution Experience from 2000 to 2021

Harrison M Drebin <sup>1,2</sup>, Nicholas R Kurtansky <sup>3</sup>, Sharif Hosein <sup>3</sup>, Emily Nadelmann <sup>3</sup>, Andrea P Moy <sup>4</sup>, Charlotte E Ariyan <sup>1</sup>, Danielle M Bello <sup>1</sup>, Mary S Brady <sup>1</sup>, Daniel G Coit <sup>1</sup>,

> J Surg Oncol. 2023 Jun;127(7):1167-1173. doi: 10.1002/jso.27231. Epub 2023 Mar 11.

## Are the MIA and MSKCC nomograms useful in selecting patients with melanoma for sentinel lymph node biopsy?

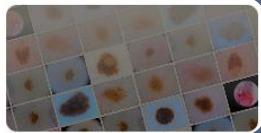
Sharif Hosein <sup>1</sup>, Harrison M Drebin <sup>2</sup>, Nicholas R Kurtansky <sup>1</sup>, Roger Olofsson Bagge <sup>3,4,5</sup>,

## Sentinel lymph node biopsy

# kaggle ISIC Grand Challenges

## SIIM-ISIC Melanoma Classification

Identify melanoma in lesion images



2020

> [Sci Data.](#) 2021 Jan 28;8(1):34. doi: 10.1038/s41597-021-00815-z.

### A patient-centric dataset of images and metadata for identifying melanomas using clinical context

Veronica Rotemberg <sup># 1</sup>, Nicholas Kurtansky <sup># 2</sup>, Brigid Betz-Stablein <sup>3</sup>, Liam Caffery <sup>3</sup>,  
Emmanouil Chousakos <sup>2 4</sup>, Noel Codella <sup>5</sup>, Marc Combalia <sup>6</sup>, Stephen Dusza <sup>2</sup>,  
Pascale Guitera <sup>7</sup>, David Gutman <sup>8</sup>, Allan Halpern <sup>2</sup>, Brian Helba <sup>9</sup>, Harald Kittler <sup>10</sup>,  
Kivanc Kose <sup>2</sup>, Steve Langer <sup>11</sup>, Konstantinos Lioprys <sup>4</sup>, Josep Malvehy <sup>6</sup>,

> [J Eur Acad Dermatol Venereol.](#) 2025 Aug;39(8):1489-1499. doi: 10.1111/jdv.20479.

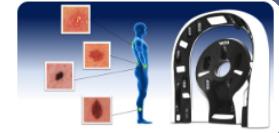
Epub 2024 Dec 8.

### Effect of patient-contextual skin images in human- and artificial intelligence-based diagnosis of melanoma: Results from the 2020 SIIM-ISIC melanoma classification challenge

Nicholas R Kurtansky <sup>1</sup>, Clare A Primiero <sup>2</sup>, Brigid Betz-Stablein <sup>2</sup>, Marc Combalia <sup>3</sup>,  
Pascale Guitera <sup>4</sup>, Allan Halpern <sup>1</sup>, Jonathan Kentley <sup>1 5</sup>, Harald Kittler <sup>6</sup>,

## ISIC 2024 - Skin Cancer Detection with 3D-TBP

Identify cancers among skin lesions cropped from 3D total body photographs



2024

> [Sci Data.](#) 2024 Aug 14;11(1):884. doi: 10.1038/s41597-024-03743-w.

### The SLICE-3D dataset: 400,000 skin lesion image crops extracted from 3D TBP for skin cancer detection

Nicholas R Kurtansky <sup>1</sup>, Brian M D'Alessandro <sup>2</sup>, Maura C Gillis <sup>3</sup>, Brigid Betz-Stablein <sup>4</sup>,  
Sara E Cerminara <sup>5</sup>, Rafael Garcia <sup>6</sup>, Marcela Alves Girundi <sup>7</sup>, Elisabeth Victoria Goessinger <sup>5</sup>,  
Philippe Gottfrois <sup>5</sup>, Pascale Guitera <sup>7 8</sup>, Allan C Halpern <sup>3</sup>, Valerie Jakrot <sup>7</sup>, Harald Kittler <sup>9</sup>,

Miriam Minkin <sup>3</sup>, Miriam Minkin <sup>3</sup>, Francesco <sup>10</sup>, Francesco <sup>11 12</sup>, Francesco <sup>13 14</sup>



npj | digital medicine

CURRENT STATUS

Your revised submission is in peer review

Automated triage of cancer-suspicious skin lesions with 3D total-body photography

# Preview

Dermatology  
and skin cancer

- Incidence
- Prognosis
- Imaging trends

International  
Skin Imaging  
Collaboration

- Mission
- Working Groups
- Promoting Standards
- Engagement

ISIC Archive

- How to use most effectively
- Thought process behind new features

**1-in-5 Americans will develop skin cancer in their lifetime<sup>1</sup>**

Type	Survival <sup>1</sup>
Melanoma	Highly treatable if detected early 75% 5yr survival if spread to regional lymph nodes 35% 5yr survival if spread to distant lymph nodes
Basal cell carcinoma	Highly treatable if detected early
Squamous cell carcinoma	Highly treatable if detected early

<sup>1</sup> <https://www.aad.org/media/stats-skin-cancer>

# Digital imaging techniques in dermatology

Jenny L. Stone, MD,<sup>a</sup> Robert L. Peterson, MD,<sup>b</sup> and John E. Wolf, Jr., MD<sup>a</sup>  
*Houston, Texas*

Digital imaging is a versatile technique that has been infrequently used in dermatology to record visual images. We have used this technology for 10 patients to follow cutaneous lesions, including alopecia mucinosa, psoriasis, and dysplastic nevi. The setup included a personal computer, digitizer board, monitor, video camera, and lights. An introduction to electronic (digital) imaging is given and some of the many possible applications in dermatology are discussed. (*J AM ACAD DERMATOL* 1990;23:913-7.)

JAAD - 1990

>80% of dermatologists capture digital photos

> J Am Acad Dermatol. 2013 Nov;69(5):837-838. doi: 10.1016/j.jaad.2013.07.010.

## The use of digital cameras by US dermatologists

Peter Accetta <sup>1</sup>, Julia Accetta <sup>2</sup>, James Kostecki <sup>3</sup>

**Table I.** Physician and practice characteristics by use of photography in practice

Characteristic	Photographers	Non-photographers	Total
Gender			
Male	80.1%	19.9%	56.0%
Female	84.9%	15.1%	44.0%
Age (yr)			
< 40	90.1%	9.9%	24.1%
40-49	80.6%	19.4%	26.0%
50-59	80.9%	19.1%	29.2%
60+	76.9%	23.1%	20.7%
Practice setting			
Solo	74.0%	26.0%	34.7%
Dermatology group	85.7%	14.3%	42.7%
Multispecialty group	86.3%	13.7%	13.5%
Academic	93.9%	6.1%	8.8%
NR			0.3%
Total	82.2%	17.8%	100.0%

NR, No response.

JAAD - 2013

# International Skin Imaging Collaboration



Founded in 2013

*Mission: Advance digital skin imaging to reduce skin cancer burden.*



**Working Groups:** Technology – Technique – Terminology – Privacy – DICOM – AI – Education – Community Engagement

# What is the ISIC Archive?

1. Archive of individual skin images

*With structured data elements (data dictionary)*

2. Repository of skin image datasets

*May contain unstandardized/study-specific data*

Image total (public)	549,575
Image total (public + embargoed)	1,203,229
Public datasets	53
Datasets DOIs	17
Total users	10,592
Sessions per month	20,000

**Registry of Open Data on AWS**

## International Skin Imaging Collaboration (ISIC) Archive

biology cancer classification computational pathology dicom grand-challenge.org health Homo sapiens imaging life sciences machine learning medical image computing medical imaging medicine microscopy segmentation

### Description

A public-access archive of skin lesion images, supporting teaching, research, and the development and evaluation of diagnostic algorithms.

### Update Frequency

Upon new data ingest from contributors.

### License

Creative Commons licenses (CC-0, CC-BY, or CC-BY-NC) are defined per-image.

### Documentation

<https://www.isic-archive.com/>

### Managed By

International Skin Imaging Collaboration (ISIC)

See all datasets managed by International Skin Imaging Collaboration (ISIC).

### Contact

[support@isic-archive.com](mailto:support@isic-archive.com)

### How to Cite

International Skin Imaging Collaboration (ISIC) Archive was accessed on DATE from <https://registry.opendata.aws/isic-archive>.

### Usage Examples

Tutorials

- ISIC Archive Data Dictionary by International Skin Imaging Collaboration (ISIC)

### Tools & Applications

- ISIC Archive Gallery by International Skin Imaging Collaboration (ISIC)
- isic-cli - The official command line tool for interacting with the ISIC Archive by International Skin Imaging Collaboration (ISIC)

### Publications

- A patient-centric dataset of images and metadata for identifying melanomas



# The AWS Open Data Sponsorship Program

Sustainability reassured by  
AWS sponsorship

Google

ISIC Archive

Last updated Download format Croissant Usage rights Topic Provider Saved datasets

Free

24 datasets found

O International Skin Imaging Collaboration (ISIC) Archive registry.opendata.aws Updated Aug 12, 2025

I DERM12345 api.isic-archive.com Updated 2025

kaggle Skin Cancer: Malignant vs. Benign kaggle.com Updated Jun 19, 2019

I MILK10K api.isic-archive.com

**International Skin Imaging Collaboration (ISIC) Archive**

Explore at: [registry.opendata.aws](https://registry.opendata.aws)

255 scholarly articles cite this dataset (View in Google Scholar)

**Dataset updated**  
Aug 12, 2025

**Dataset provided by**  
International Skin Imaging Collaboration (ISIC)

**License**  
CC0 1.0 Universal Public Domain Dedication

**Description**  
A public-access archive of skin lesion images, supporting teaching, research, and the development and evaluation of diagnostic algorithms.



Indexed in Google dataset-search

3 questions  
for when considering  
**NEW FEATURES**

1. Why is it important?
2. Does it break anything?
3. Who is it for?

- User feedback & demand
- Working group initiatives
- Scalability
- Research vision



M-ISIC: A MULTIMODAL OPEN-SOURCE INTERNATIONAL SKIN IMAGING COLLABORATION INFORMATICS PLATFORM FOR AUTOMATED SKIN CANCER DETECTION

- Funding agent vision



ISIC-REPO; ISIC SKIN IMAGING REPOSITORY ENHANCEMENTS FOR PROMOTING INTEROPERABILITY AND UTILIZATION

## 1. Why is it important?

*Mission: Advance digital skin imaging to reduce skin cancer burden.*

1. Promote standards
2. Engagement

## 2. Does it break anything?



*Align with built infrastructure?*

*Maintainability*

*Scalability*

### 3. Who is it for?

#### Data Users

*Model developers, educators, & presenters*

- Looking for existing benchmark datasets
- Looking for certain types of cases

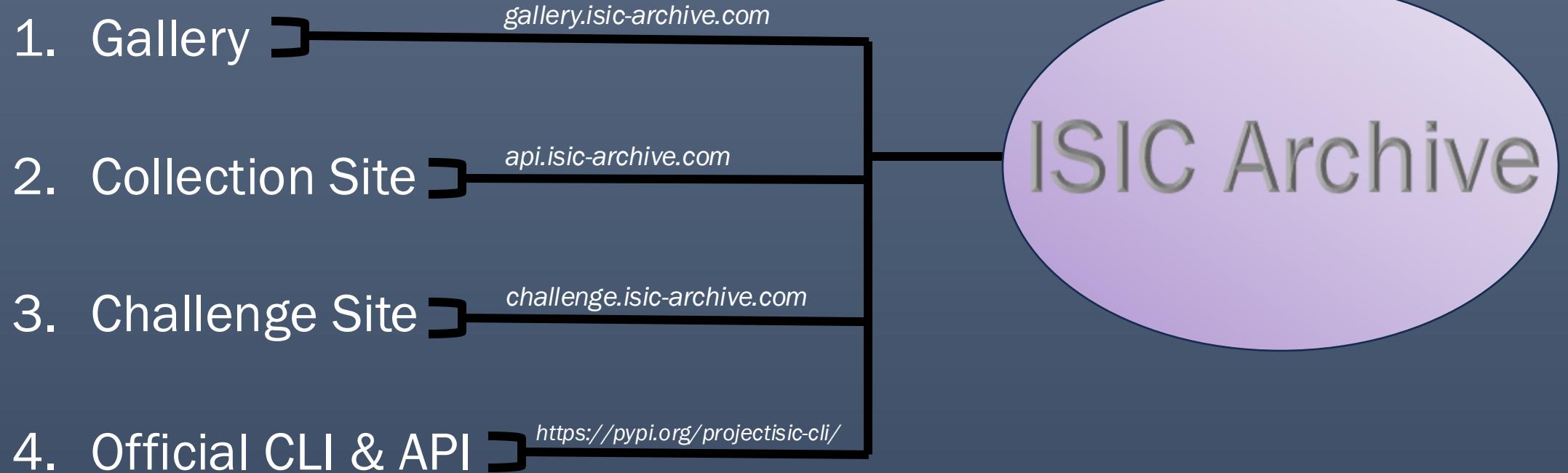
#### Data Publishers

*Researchers & image-contributors*

- Uploading new images
- Publishing a study
- Using a custom subset of existing data

# Examples

# Multiple ways to access



# Multiple ways to access:

## 1. Gallery



Shown images: 49-64. Filtered images: 12871. Total amount of images: 1203229.

Automatic width compilation

Search by filters  Search by name

challenge 2019

APPLIED FILTERS  Clear applied filters

BENIGN BENIGN MELANOCYTIC PROL... Nevus

Collection: Challenge 2019: Training

Download ZIP

DIAGNOSTIC ATTRIBUTES

▼ LESION DIAGNOSIS

►  BENIGN (12871 / 1136546)

►  MAST CELL PROLIFERATIONS (0 / 4)

►  INFLAMMATORY OR INFECTIOUS DISEASE...

►  BENIGN - OTHER (0 / 2498)

►  BENIGN ADNEXAL EPITHELIAL PROLIFERA...

►  BENIGN ADNEXAL EPITHELIAL PROLIFERA...

►  BENIGN ADNEXAL EPITHELIAL PROLIFERA...

►  BENIGN EPIDERMAL PROLIFERATIONS (0 / ...)

►  BENIGN SOFT TISSUE PROLIFERATIONS - F...

►  BENIGN MELANOCYTIC PROLIFERATIONS (...)

▼  Nevus (12871 / 59701)

Nevus, Spitz (16 / 111)

Nevus, Spilus (1 / 9)

Nevus, Reed (2 / 102)

Nevus, Recurrent or persistent (23 / 9...

Nevus, Of special anatomic site (0 / 2)

Nevus, NOS, Junctional (18 / 3285)

Nevus, NOS, Dermal (30 / 1092)

Nevus, NOS, Compound (76 / 4107)

Nevus, Lentiginous (27 / 121)

Nevus, Halo (2 / 10)

Nevus, Deep penetrating (0 / 15)

►  Nevus, Congenital (162 / 761)

►  Nevus, Combined (29 / 113)

►  Nevus, Balloon cell (0 / 2)

Select All on the Page for Download  Unselect 6 images

ISIC\_0000068  ISIC\_0000075  ISIC\_0000073  ISIC\_0000082  ISIC\_0000081  ISIC\_0000069

Download ZIP

Faceted search  
Faceted filter  
Download filter

Image selection  
Download selection

Search by filters  Search by name

challenge 2019

APPLIED FILTERS

BENIGN BENIGN MELANOCYTIC PROL... Nevus   
Collection: Challenge 2019: Training

DIAGNOSTIC ATTRIBUTES

▼ LESION DIAGNOSIS

BENIGN (12871 / 1136546)  
 MAST CELL PROLIFERATIONS (0 / 4)  
 INFLAMMATORY OR INFECTIOUS DISEASE...  
 BENIGN - OTHER (0 / 2498)  
 BENIGN ADNEXAL EPITHELIAL PROLIFERA...  
 BENIGN ADNEXAL EPITHELIAL PROLIFERA...  
 BENIGN EPIDERMAL PROLIFERATIONS (0 / ...)  
 BENIGN SOFT TISSUE PROLIFERATIONS - F...  
 BENIGN MELANOCYTIC PROLIFERATIONS (...)

Nevus (12871 / 59701)  
 Nevus, Spitz (16 / 111)  
 Nevus, Spilus (1 / 9)  
 Nevus, Reed (2 / 102)  
 Nevus, Recurrent or persistent (23 / 9...)  
 Nevus, Of special anatomic site (0 / 2)  
 Nevus, NOS, Junctional (18 / 3285)  
 Nevus, NOS, Dermal (30 / 1092)  
 Nevus, NOS, Compound (76 / 4107)  
 Nevus, Lentiginous (27 / 121)  
 Nevus, Halo (2 / 10)  
 Nevus, Deep penetrating (0 / 15)  
 Nevus, Congenital (162 / 761)  
 Nevus, Combined (29 / 113)  
 Nevus, Balloon cell (0 / 2)

Select All on the Page for Download   
Unselect 6 images

Shown images: 49-64. Filtered images: 12871. Total amount of images: 1203229.

Automatic width compilation

ISIC\_0000068   
ISIC\_0000075   
ISIC\_0000073   
ISIC\_0000082   
ISIC\_0000081   
ISIC\_0000069

The screenshot displays a user interface for a digital pathology application. At the top, there are search and filter options: 'Search by filters' (with a checkbox), 'Search by name' (with a magnifying glass icon), and a search bar containing 'challenge 2019'. Below this is a 'APPLIED FILTERS' section with buttons for 'BENIGN', 'BENIGN MELANOCYTIC PROLIF...', 'Nevus', and a 'Collection: Challenge 2019: Training' dropdown. A large orange box highlights the 'DIAGNOSTIC ATTRIBUTES' sidebar on the left, which lists lesion diagnoses and specific Nevus types with their counts. Several images of skin lesions are shown in a grid, with some highlighted by green boxes. A blue box highlights a vertical column of images. A purple box highlights the bottom right corner of the interface. On the far right, a list of image IDs is shown, each with a delete button: ISIC\_0000068, ISIC\_0000075, ISIC\_0000073, ISIC\_0000082, ISIC\_0000081, and ISIC\_0000069. At the bottom right, there is a 'Download ZIP' button.

# International Skin Imaging Collaboration—Designated Diagnoses (ISIC-DX): Consensus terminology for lesion diagnostic labeling

Alon Scope <sup>1 2</sup>, Konstantinos Liopyris <sup>2 3</sup>, Jochen Weber <sup>2</sup>, Raymond L Barnhill <sup>4</sup>,  
Ralph P Braun <sup>5</sup>, Clara N Curiel-Lewandrowski <sup>6</sup>, David E Elder <sup>7</sup>, Gerardo Ferrara <sup>8</sup>,  
Jane M Grant-Kels <sup>9 10</sup>, Thiago Jeunon <sup>11</sup>, Aimilios Lallas <sup>12</sup>, Jennifer Y Lin <sup>13</sup>,

Diagnosis  
- Benign  
-- Benign melanocytic proliferations  
--- Nevus  
---- Blue nevus  
----- Blue nevus, Cellular  
----- Blue nevus, Common  
----- Blue nevus, Epithelioid  
----- Blue nevus, Plaque type  
----- Blue nevus, Sclerosing  
--- Nevus, Acral  
--- Nevus, Agminated  
--- Nevus, Atypical, Dysplastic, or Clark  
---- Nevus, Atypical  
---- Nevus, Dysplastic  
----- Nevus, Clark  
---- Nevus, BAP-1 deficient  
--- Nevus, Balloon cell  
--- Nevus, Combined  
--- Nevus, Congenital  
---- Nevus, Congenital, by history  
---- Nevus, Congenital, by histopathological pattern  
----- Nevus, Congenital, by history and histopatholog  
--- Nevus, Deep penetrating  
--- Nevus, Halo  
--- Nevus, Lentiginous  
---- Nevus, Meyerson  
---- Nevus, NOS, Compound  
---- Nevus, NOS, Dermal  
---- Nevus, NOS, Junctional  
---- Nevus, Of special anatomic site  
---- Nevus, Recurrent or persistent  
---- Nevus, Reed  
---- Nevus, Spilus  
----- Nevus, Spitz  
- Dermal melanocytosis  
--- Mongolian spot  
--- Nevus of Ito  
----- Nevus of Ota  
- Lentiginous melanocytic proliferation  
- Lentigo simplex  
- Pigmented epithelioid melanocytoma  
----- Proliferative nodule in congenital melanocytic nevi wi

“Nevus” branch  
of taxonomy tree

## Filter with new diagnostic taxonomy

### DIAGNOSTIC ATTRIBUTES

#### ▼ LESION DIAGNOSIS

►  BENIGN (0 / 1136546)

▼  INDETERMINATE (387 / 3798)

▼  INDETERMINATE MELANOCYTIC PROLIFERATIONS (387 / 631)

Atypical melanocytic neoplasm (387)

Atypical intraepithelial melanocytic proliferation (0 / 235)

Atypical Spitz tumor (0 / 5)

Atypical proliferative nodules in congenital melanocytic nevus (0 / 4)

►  INDETERMINATE EPIDERMAL PROLIFERATIONS (0 / 3160)

►  MALIGNANT (0 / 31528)

► TYPE OF DIAGNOSIS (387 / 358234)

► MELANOCYTIC

► MELANOMA MITOTIC INDEX

► MELANOMA THICKNESS (MM)

► MELANOMA ULCERATION

1. Why is it important?
2. Does it break anything?
3. Who is it for?

1. Why is it important?
2. Does it break anything?
3. Who is it for?

# Incorporating multimodal imaging

Dermoscopy



Clinical  
Close-up &  
Overview



3D TBP



Reflectance  
Confocal  
Microscopy



1. Why is it important?
2. Does it break anything?
3. Who is it for?

# Supporting image relations

Patient ID

3D TBP image

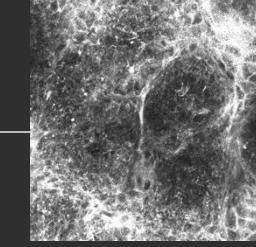
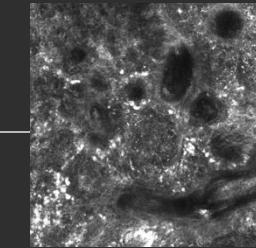
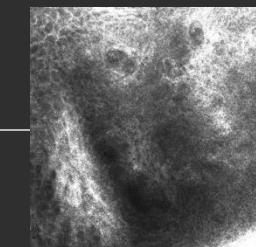
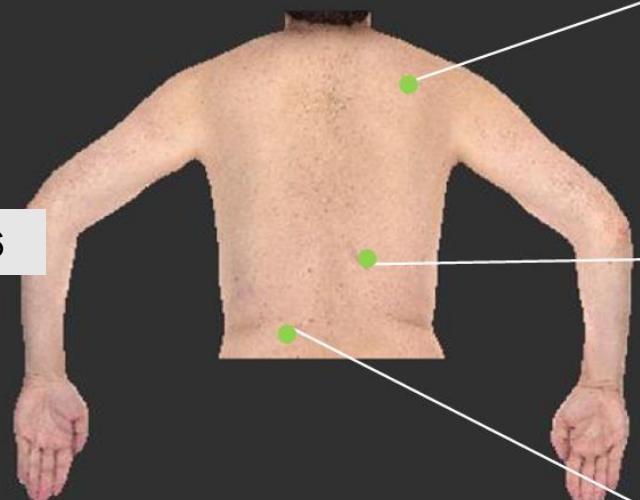
Tile images

Dermoscopic images

RCM images

Lesion ID

IP\_8209756



IL\_1774294

IL\_0235712

IL\_5463461

1. Why is it important?
2. Does it break anything?
3. Who is it for?

# Multi-image case viewer

The diagram illustrates the transition from a mobile device interface to a desktop application interface. On the left, a smartphone screen displays a lesion image with the ID 'ISIC\_1767451'. A callout bubble labeled 'Lesion' points to a specific area on the image. An arrow points from this bubble to a larger, stylized smartphone icon. From this icon, another arrow points to a desktop computer monitor. The monitor displays two side-by-side lesion images. The left image, with ID 'ISIC\_2746016', is a close-up 'TBP tile' showing a brown, textured lesion. The right image, with ID 'ISIC\_9465412', is a 'RCM: mosaic' showing a dark, irregular lesion against a lighter background. Both images include detailed metadata at the bottom.

ISIC\_1767451

Lesion

ISIC\_2746016

Group by: Modality

ISIC\_9465412

Group by: Modality

ISIC\_2039298

Number of unique time points: 2

Modality: TBP tile: close-up

Availability of multiple modalities: Yes

# of total lesion images: 8

ISIC\_2039298

Number of unique time points: 2

Modality: RCM: mosaic

Availability of multiple modalities: Yes

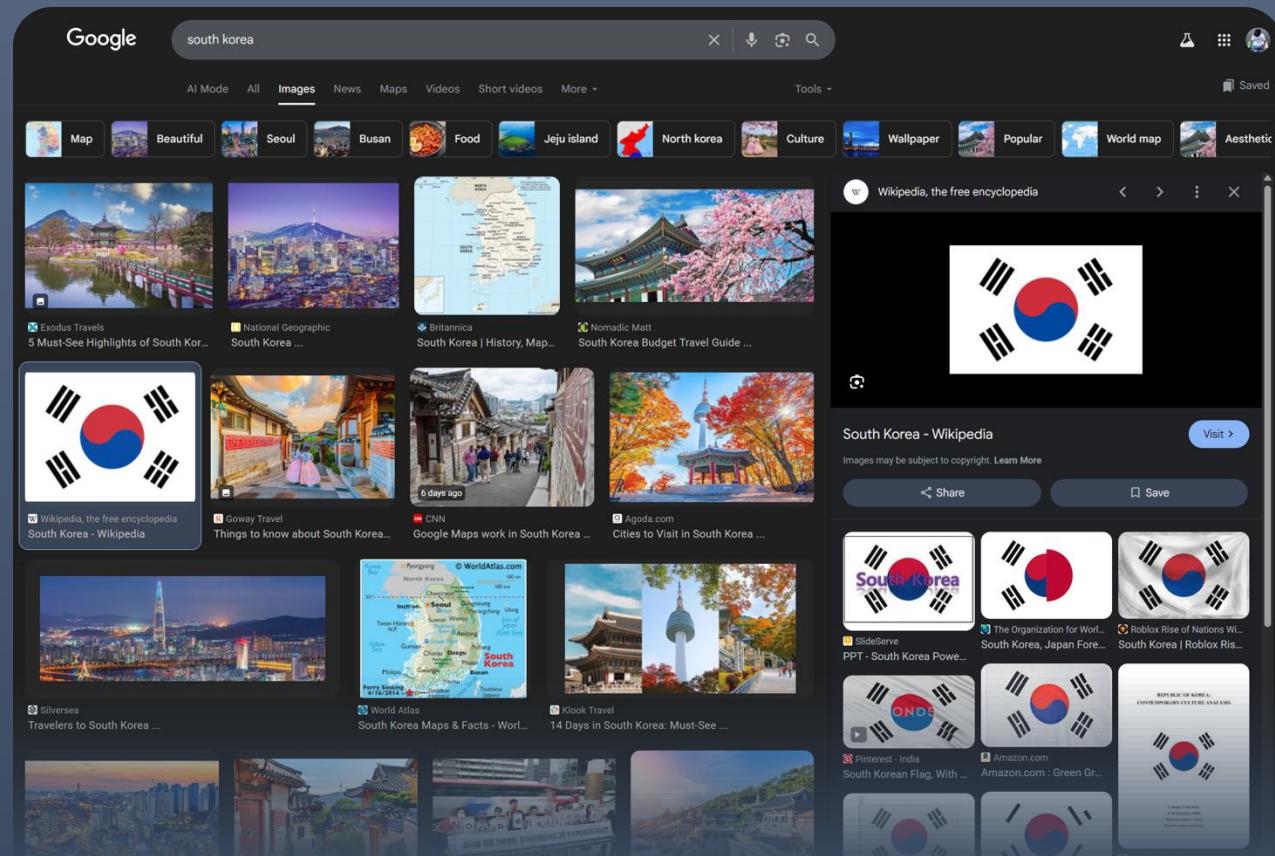
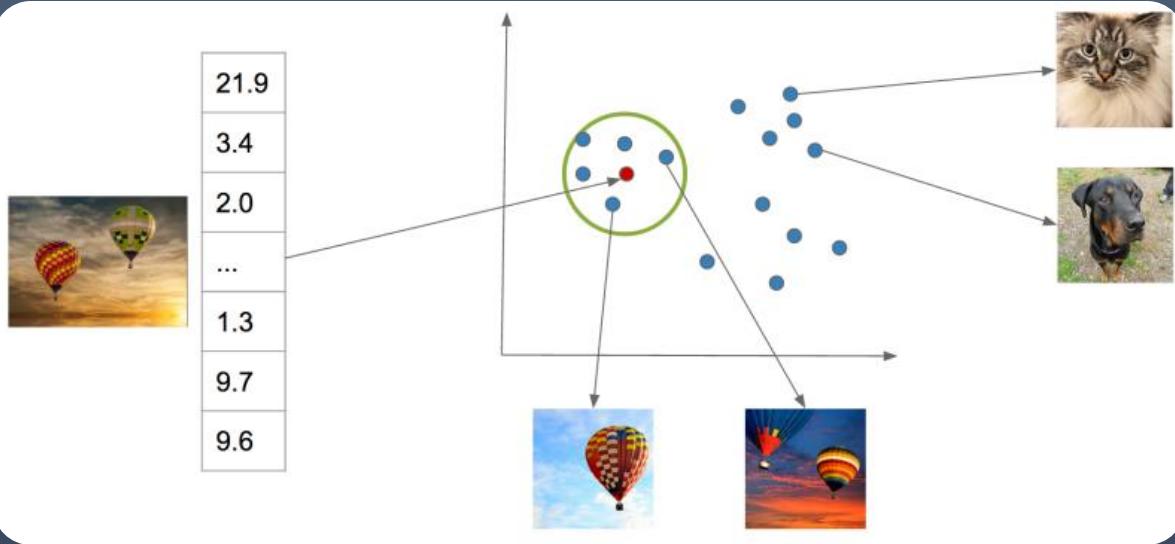
Time point: undefined

# of total lesion images: 8

1. Why is it important?
2. Does it break anything?
3. Who is it for?

# Visual similarity search

- Future capability
- Storing vector representations
- More control over Gallery search



Google Images

# Multiple ways to access:

1. Gallery
2. Collection Site



## Collections

Actions ▾

PINNED 19 DOI 23 SHARED WITH ME 0 MINE 64 ALL 204

PROVe-AI  
603 images

BRAAFF-Annotated Acral Lesions Dataset (BALD)  
666 images

Consecutive biopsies for melanoma across year 2020  
1,295 images

Consumer AI apps  
351 images

DERM12345  
12,345 images

Hospital Italiano de Buenos Aires Sk...  
1,635 images

iToBoS 2024 - Skin Lesion Detection with 3D-...  
16,954 images

**collection**  
a custom selection  
of published images

Melanocytic lesions used for dermoscopic feature annotations  
248 images

Melanoma and Nevus Dermoscopy Images with Confirmed  
Histopathological Diagnosis  
18,133 images

MILK10k  
10,480 images

MILK10k Benchmark  
958 images

# Curated datasets

PROVe-AI  
603 images

Consecutive biopsies for melanoma across year 2020  
1,295 images

DERM12345  
12,345 images

Hospital Italiano de Buenos Aires Skin Lesions  
1,635 images

iToBoS 2024 - Skin Lesion Detection with 3D-TBP  
16,954 images

Melanocytic lesions used for dermoscopic feature annotations  
248 images

BRAAFF-Annotated Acral Lesions Dataset (BALD)  
666 images

Consumer AI apps  
35 images

HIBA Skin Lesions  
1,635 images

Hospital Italiano de Buenos Aires - Skin Lesions Images (2019-2022)  
1,616 images

Longitudinal overview images of posterior trunks  
36 images

Melanoma and Nevus Dermoscopy Images with Confirmed Histopathological Diagnosis  
18,133 images

BCN20000  
18,946 images

Challenge 2016: Training  
900 images

Challenge 2017: Training  
2,000 images

Challenge 2018: Task 1-2: Test  
1,000 images

Challenge 2018: Task 1-2: Validation  
100 images

Challenge 2018: Task 3: Training  
10,015 images

Challenge 2019: Test  
8,238 images

Challenge 2016: Test  
379 images

Challenge 2017: Test  
600 images

Challenge 2017: Validation  
150 images

Challenge 2018: Task 1-2: Training  
2,594 images

Challenge 2018: Task 3: Test  
1,512 images

Challenge 2018: Task 3: Validation  
193 images

Challenge 2019: Training  
25,331 images

## From Research Studies

## From Grand Challenges

*Conducting research?*

- Annotating an existing dataset?
- Focused selection of images?

*Consider creating your own collections!*

- Save for future downloads
- Get a DOI link for your manuscript

# Collection DOI Page

Collection name

Link to view images

Custom description

License and citation

File download links

MILK10k

**MILK10k** consists of 10480 images, each representing a paired clinical close-up and dermatoscopic image for 5240 lesions. The dataset's metadata include age (in 5-year intervals), sex, anatomic site, skin tone, diagnosis, method of ground truth establishment (histopathology or other means), and, if a dermatoscopic image of the same lesion was previously included in ISIC, its corresponding ISIC identifier. Skin tone is categorized into six levels, ranging from very dark (0) to very light (5), intentionally distinct from the Fitzpatrick skin types to avoid confusion. Most patients had skin tones in the middle ranges. Of the 5240 lesions, 95.7% were biopsied or excised, with histopathology serving as the gold standard for diagnosis. Diagnoses were mapped to both the ISIC-Dx diagnostic schema and a simplified classification based on the ISIC2018/2019 challenge and HAM10000 diagnostic categories. The dataset includes 11 broad diagnostic categories:

1. Basal cell carcinoma (bcc)
2. Melanocytic nevus (nv)
3. Benign keratinocytic lesion (blk)
4. Squamous cell carcinoma/keratoacanthoma (sccka)
5. Melanoma (mel)
6. Actinic keratosis/intraepidermal carcinoma (akiec)
7. Dermatofibroma (df)
8. Inflammatory and infectious conditions (inf)
9. Vascular lesions and hemorrhage (vasc)
10. Other benign proliferations including collision tumors (ben\_oth)
11. Other malignant proliferations including collision tumors (mal\_oth)

Additionally, we provide the most specific ISIC-Dx diagnosis and its parent branch in the ISIC-Dx diagnostic tree. In cases where a dermatoscopic image of the same lesion was already included in the ISIC archive, its ISIC identifier is reported in the metadata. Furthermore, all images have been annotated using the MONET framework, with probabilities for the following concept term groups included in the metadata:

1. Ulceration, crust
2. Hair
3. Vasculature, vessels
4. Erythema
5. Pigmentation
6. Gel, water drop, fluid, dermoscopy liquid
7. Skin markings, pen ink, purple pen

In addition to *MILK10k*, we have curated a smaller benchmark dataset, called *MILK10k Benchmark* derived from the same sources and covering the same diagnostic categories. This dataset is available as part of a live challenge within the ISIC framework and can be accessed on ISIC.

Images were provided by the following institutions:

- Department of Dermatology, Medical University of Vienna, Vienna, Austria
- Medicine Faculty Department of Dermatology, Ankara University, Ankara, Turkey
- Mayne Academy of General Practice, Medical School, The University of Queensland, Australia
- Dermatology Service, Memorial Sloan Kettering Cancer Center, New York, USA
- Independent Researcher, 1000 Skopje, North Macedonia

**Dataset Details**

Published Jul 1, 2025 10:19 AM  
DOI 10.34970/648456  
Images 10,480  
Attributions • MILK study team

**Licenses**

CC-BY-NC This content is free to use, modify, and share for non-commercial purposes, as long as you provide credit to the original creator.

**How to Cite** APA

MILK study team. (2025). *MILK10k* [Data set]. ISIC Archive. <https://doi.org/10.34970/648456>

**COPY CITATION**

**Files**

DESCRIPTION	SIZE	TYPE	ACTION
The complete bundle of all images, metadata, and supplemental files related to this dataset.	341.5 MB	ZIP	<a href="#">DOWNLOAD</a>
The metadata for this dataset.	2.0 MB	CSV	<a href="#">DOWNLOAD</a>
Model input metadata containing non-diagnostic image-level attributes	2.5 MB	CSV	<a href="#">DOWNLOAD</a>
Ground truth file containing one-hot encoded lesion-level diagnostic labels	184.3 KB	CSV	<a href="#">DOWNLOAD</a>
Image-level diagnostic attributes absent from the model input file	626.1 KB	CSV	<a href="#">DOWNLOAD</a>

# Benefits of Collections DOIs

1. Why is it important?
2. Does it break anything?
3. Who is it for?

## Discoverability

- Indexed on Google dataset search

## Machine readability

- Related identifiers - standard DataCite property
- Facilitates links to related study article, descriptor, or GitHub repo

## Supplemental data

- Study-specific annotations

## Data consistency

- “Frozen ZIPs” ensure data won’t be impacted by future changes

## Draft pages

- Adjust the hidden page prior to study publication

1. Why is it important?
2. Does it break anything?
3. Who is it for?

# Create custom collection from existing data:

1. Initialize on the Collection Site
2. Create a line-separate file of select ISIC\_IDs
  - Utilize *image search functionality*
3. Add images to the collection using ISIC-CLI
  - *Mentioned later*

**Create a Collection**

A Collection is a container for a set of images. Collections can be used as the basis for sharing images or creating studies. A Collection can be public or private, and each of the individual images within it can be public or private.

Name

Description   
Supports [markdown](#).

Public  A public collection can't contain private images.

**CREATE COLLECTION**

## If minting a DOI:

4. Prepare supplemental files (if necessary)
5. Contact us at [support@isic-archive.com](mailto:support@isic-archive.com)

# Multiple ways to access:

1. Gallery
2. Collection Site
3. Challenge Site



ISIC CHALLENGE

ISIC Home Data Stats Challenges Leaderboards SUBSCRIBE LOGIN SIGN UP

REPORT AN ISSUE

### ISIC Challenge Datasets

2016 2017 2018 2019 2020 2024 MILK10k

Task	Training Data	Training Ground Truth	Validation Data	Validation Ground Truth	Test Data	Test Ground Truth	License
1	<a href="#">Download (10.4GB)</a> 2594 images and 12970 corresponding ground truth response masks (5 for each image).	<a href="#">Download (26MB)</a>		<a href="#">Download (742KB)</a>	<a href="#">Download (2.2GB)</a> 1000 images.	<a href="#">Download (9MB)</a>	CC-0
2			<a href="#">Download (228MB)</a> <a href="#">Download (33MB)</a>	<a href="#">Download (1MB)</a>		<a href="#">Download (11MB)</a>	
3	<a href="#">Download (2.2GB)</a> 10015 images and 10015 corresponding ground truth response CSV files (one row and 100 columns per image). <a href="#">Download (4.2GB)</a> 10015 entries. Each entry contains one image and one CSV file. Further explanations about the data can be found in the dataset description.						

### ISIC Live

TEAMS: 2,042

SUCCESSFUL APPROACHES:  
approaches with at least 1 successful submission 6,112

TOTAL SUBMISSIONS PROCESSED: 22,599

Tasks	Success/Total
2018.1: Lesion Boundary Segmentation	668/2,160
2018.2: Lesion Attribute Detection	50/54
2018.3: Lesion Diagnosis	3,835/15,451
2019: Lesion Diagnosis	1,632/4,036
2020: SIIM-ISIC Melanoma Classification	456/898

# HAM10000 dataset released in 2018

- 10,000 dermoscopic images
- Austria & Australia
- 7 diagnostic classes
- 2018 & 2019 Grand Challenges
- Thousands of citations

Data Descriptor | [Open access](#) | Published: 14 August 2018

**The HAM10000 dataset, a large collection of multi-source dermatoscopic images of common pigmented skin lesions**

[Philipp Tschandl](#)✉, [Cliff Rosendahl](#) & [Harald Kittler](#)

[Scientific Data](#) 5, Article number: 180161 (2018) | [Cite this article](#)

119k Accesses | 2847 Citations | 27 Altmetric | [Metrics](#)

# “MILK10k”

## A new benchmarking platform

> J Invest Dermatol. 2025 Jul 21:S0022-202X(25)02270-5. doi: 10.1016/j.jid.2025.06.1594.  
Online ahead of print.

### MILK10k: A hierarchical multimodal imaging learning toolkit for diagnosing pigmented and non-pigmented skin cancer and its simulators

Tschandl Philipp <sup>1</sup>, Akay Nisa Bengü <sup>2</sup>, Rosendahl Cliff <sup>3</sup>, Rotemberg Veronica <sup>4</sup>,  
Todorovska Verche <sup>5</sup>, Weber Jochen <sup>4</sup>, Wolber Anna Katharina <sup>6</sup>, Müller Christoph <sup>6</sup>,  
Kurtansky Nicholas <sup>4</sup>, Halpern Allan <sup>4</sup>, Weninger Wolfgang <sup>6</sup>, Kittler Harald <sup>7</sup>

Affiliations + expand

PMID: 40701400 DOI: 10.1016/j.jid.2025.06.1594

Data descriptor

**MILK10k Benchmark**

**Dataset Details**

- Published: Jul 1, 2025 10:24 AM
- DOI: 10.34970/262082
- Images: 958
- Attributions: MILK study team

**Licenses**

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This content is free to use, modify, and share for non-commercial purposes, as long as you provide credit to the original creator.

**How to Cite**

MILK study team. (2025). *MILK10k Benchmark* [Data set]. ISIC Archive. <https://doi.org/10.34970/262082>

**MILK10k**

**Dataset Details**

- Published: Jul 1, 2025 10:19 AM
- DOI: 10.34970/648456
- Images: 10,480
- Attributions: MILK study team

**Licenses**

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**How to Cite**

MILK study team. (2025). *MILK10k* [Data set]. ISIC Archive. <https://doi.org/10.34970/648456>

DOI Collections

# “MILK10k”

## Multi-modal dataset

Two parts

1. Training<sup>1</sup>
2. Test<sup>2</sup> (dx labels hidden)

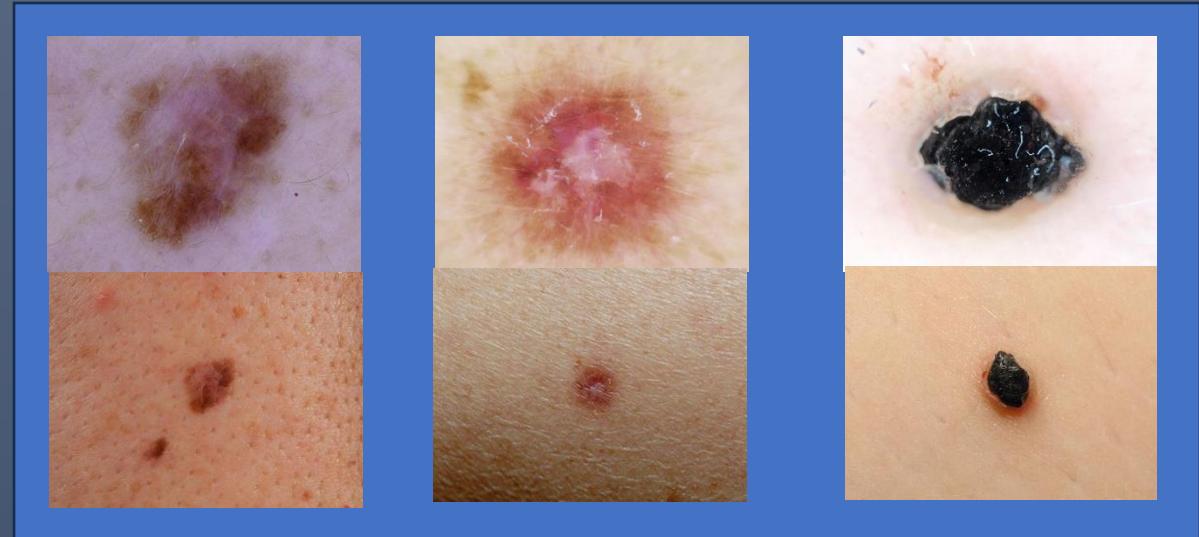
Lesions contain two images

- Dermoscopic
- Clinical close-up

Metadata

- Diagnosis (ISIC-DX schema<sup>3</sup>)
- Age, sex, anatomical site
- Skin tone
- MONET<sup>4</sup> framework annotations

(1) ulceration/crust,  
(2) hair,  
(3) vasculature,  
(4) erythema,  
(5) pigmentation,  
(6) gel/fluid,  
(7) pen/skin markings



	Train <i>MILK10k</i>	Test <i>MILK10k Bench</i>
Lesion count	5,240	479
Image count	10,480	958

<sup>1</sup> MILK study team. (2025). *MILK10k* [Data set]. ISIC Archive. <https://doi.org/10.34970/648456>

<sup>2</sup> MILK study team. (2025). *MILK10k Benchmark* [Data set]. ISIC Archive. <https://doi.org/10.34970/262082>

<sup>3</sup> Scope A, Liopyris K, Weber J, et al. International Skin Imaging Collaboration-Designated Diagnoses (ISIC-DX): Consensus terminology for lesion diagnostic labeling. *J Eur Acad Dermatol Venereol.* 2025;39(1):117-125.

<sup>4</sup> Kim C, Gadgil SU, DeGrave AJ, et al. Transparent medical image AI via an image-text foundation model grounded in medical literature. *Nat Med.* 2024;30(4):1154-1165.

# “MILK10k” Challenge Submission Platform

1. Why is it important?
2. Does it break anything?
3. Who is it for?

The screenshot shows the landing page for the MILK10k challenge. At the top, there's a banner with the text "The MILK10k Challenge is open!" and a "Join the competition!" button. Below this, a large teal button says "Get Started". Underneath are two buttons: "SUBMIT TO CHALLENGE" and "DOWNLOAD DATA". To the right of the teal button is a yellow "REPORT AN ISSUE" button. The main content area has a section titled "Summary" which describes the goal of developing image analysis tools for skin lesion diagnosis. It lists clinical and dermatoscopic images as inputs and provides a detailed list of diagnostic categories: AKIEC, BCC, BEN\_OTH, BKL, DF, INF, MAL\_OTH, MEL, NV, SCCKA, and VASC. A "Task" section explains the multi-category classification requirement and lists the eleven categories again.

The screenshot shows the MILK10k 2025 Leaderboards page. At the top, it says "The MILK10k Challenge is open!" and "Join the competition!". Below this is a section titled "MILK10k 2025 Leaderboards" with a "Group By Team" toggle switch. The first row of the leaderboards table is for the "PanDerm Team" from AIM for Health Lab, Monash University, using "PanDerm V2" approach, with "Used External Data" set to "No" and a "Dice Coefficient" of 0.524. Below the table is a "Category Metrics" table showing performance across all categories. To the right is an ROC curve titled "ROC PanDerm V2" comparing the team's performance against various categories. The bottom of the page shows aggregate metrics like "Balanced Multiclass Accuracy" at 0.537.

Rank	Team	Approach	Used External Data	Primary Metric Value
1	PanDerm Team AIM for Health Lab, Monash University	PanDerm V2	No	0.524

Category Metrics	AUC	AUC, Sens > 80%	Average Precision	Accuracy	Sensitivity	Specificity	Dice Coefficient	PPV	NPV			
AKIEC	0.927	0.899	0.963	0.924	0.886	0.979	0.919	0.793	0.958	0.955	0.936	0.991
BCC	0.888	0.804	0.937	0.872	0.768	0.957	0.871	0.636	0.920	0.935	0.971	0.981
BEN_OTH	0.583	0.682	0.802	0.111	0.745	0.544	0.340	0.114	0.720	0.837	0.846	0.675
BKL	0.948	0.896	0.927	0.983	0.887	0.990	0.979	0.979	0.950	0.954	0.887	0.994
DF	0.480	0.483	0.902	0.000	0.630	0.333	0.364	0.000	0.564	0.692	0.701	0.800
INF	0.978	0.986	0.931	0.998	0.955	0.998	0.994	1.000	0.984	0.988	0.948	0.998
MAL_OTH	0.978	0.986	0.931	0.998	0.955	0.998	0.994	1.000	0.984	0.988	0.948	0.998
MEL	0.924	0.583	0.759	0.000	0.700	0.444	0.444	0.000	0.647	0.766	0.752	0.867
NV	0.688	0.714	0.655	0.000	0.787	0.687	0.571	1.000	0.759	0.857	0.812	0.750
SCCKA	0.962	0.916	0.985	0.985	0.907	0.992	0.985	0.979	0.962	0.963	0.907	0.996
VASC	0.962	0.916	0.985	0.985	0.907	0.992	0.985	0.979	0.962	0.963	0.907	0.996

<https://challenge.isic-archive.com/landing/milk10k/>

# Multiple ways to access:

1. Gallery
2. Collection Site
3. Challenge Site
4. Official CLI & API

Interact programmatically  
with the ISIC Archive

The screenshot shows the ISIC Archive API documentation on a dark-themed website. At the top, there's a search bar with placeholder text "Type '/' to search projects" and a magnifying glass icon. To the right are links for "Help", "Docs", "Sponsors", "Log in", and "Register". Below the header, the title "isic-cli 12.4.0" is displayed, along with a "pip install isic-cli" command. A green button indicates it's the "Latest version". The main content area is organized into sections: "collections", "images", and "lesions". Each section contains one or more API endpoints listed as "GET /api/v2/{resource}/{id}/" followed by a brief description. The "collections" section has two endpoints. The "images" section has three endpoints. The "lesions" section has two endpoints. Each endpoint row includes a lock icon and a dropdown arrow.

- collections**
  - `GET /api/v2/collections/` Return a list of collections.
  - `GET /api/v2/collections/{id}/` Retrieve a single collection by ID.
- images**
  - `GET /api/v2/images/` Return a list of images.
  - `GET /api/v2/images/search/` Search images with a key:value query string.
  - `GET /api/v2/images/{isic_id}/` Retrieve a single image by ISIC ID.
- lesions**
  - `GET /api/v2/lesions/{id}/` Retrieve a single lesion by ID.
  - `GET /api/v2/lesions/` Return a list of lesions with diagnoses.

## Mission of ISIC

- Creating & promoting standards
- Engaging clinical and computer vision communities

## How to find existing data on the ISIC Archive

- ISIC Gallery
- Pre-built collections
- Benchmarking platform

## Benefits of creating your own DOI Collection

- How to create a custom image-selection
- Supplemental data,
- Draft DOIs
- Linking/machine-readability

# In Summary

# Acknowledgments



## *National Institute of Health (NIH)*

- [P30] Cancer Center Support Grant
- [U24] M-ISIC: Multimodal ISIC Informatics Platform for Skin Cancer Detection
- [U24] ISIC-REPO: Repository Enhancements for Promoting Interoperability

## *Melanoma Research Alliance (MRA)*

- Team Science Award

## *Department of Defense (DOD)*

- Melanoma Scholar
- MRP Team Science Award

Send us a message      or      visit our website



*support@isic-archive.com*



*https://www.isic-archive.com/*