

iToBOS

Intelligent Total Body Scanner for Early Detection of Melanoma

Clare Primiero

Presenting on the Clinical Data Acquisition Study



"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 965221"

Self Introduction

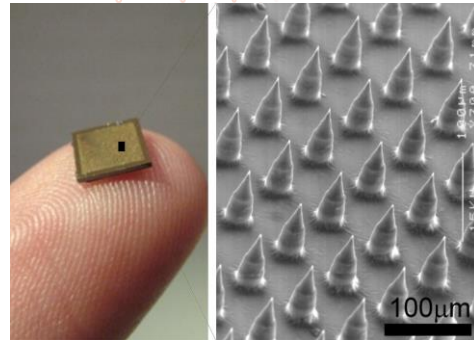


THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

FUNDACIÓ
CLÍNIC
BARCELONA



2009
BSc



2010-11



2012 - Present



2016
Masters



2022
PhD



2013



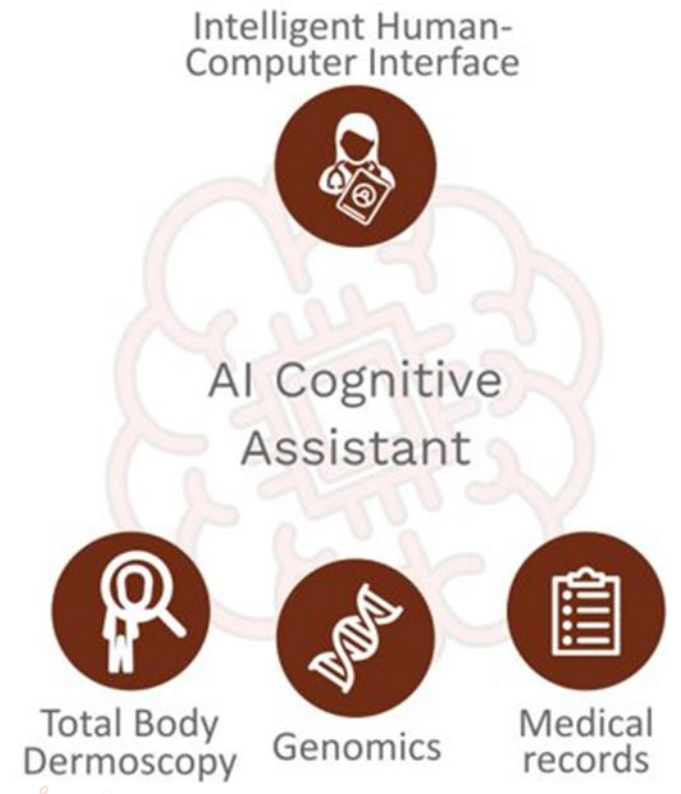
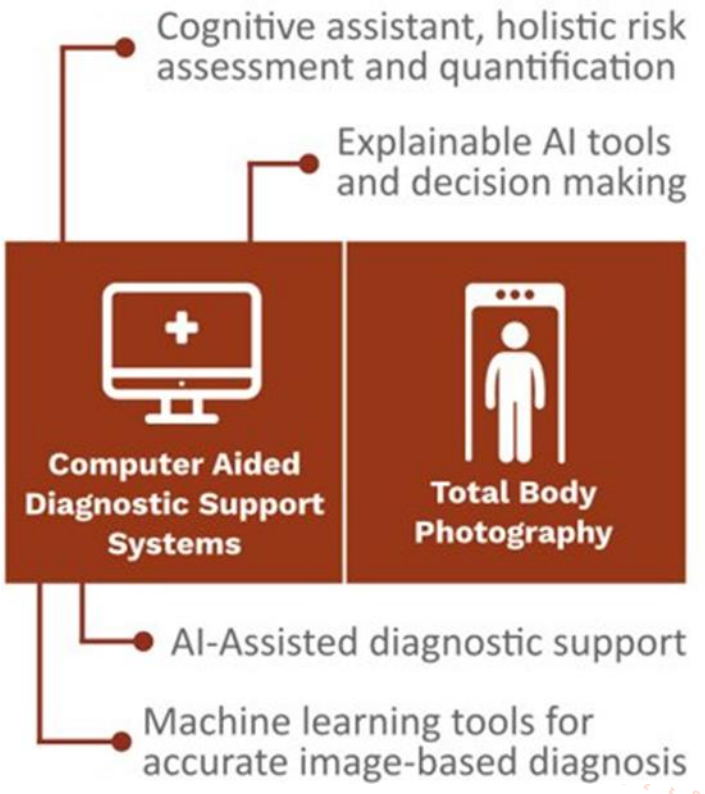
2014



2017

iTOBOS

**Intelligent Total Body Scanner
for Early Detection of Melanoma**



Clinical Data Acquisition Study



The objective of the first clinical study is to collect skin images and medical and health information from 500 people to develop a training dataset for Machine Learning.

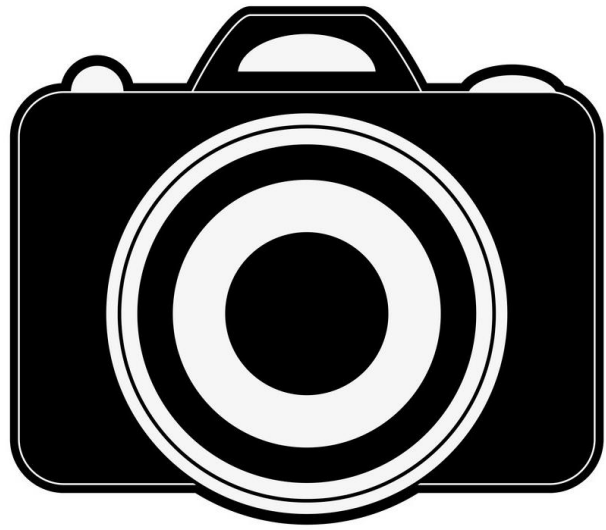


This Intelligent Total Body Scanner, or **iToBoS** for short, will combine total body imaging with computer-aided diagnostic tools to assist healthcare providers when screening for melanoma.



Using skin images and relevant health information, computer algorithms will be developed to detect and evaluate risk of individual lesions, and overall risk of the patient.

Clinical Data Acquisition Study



+



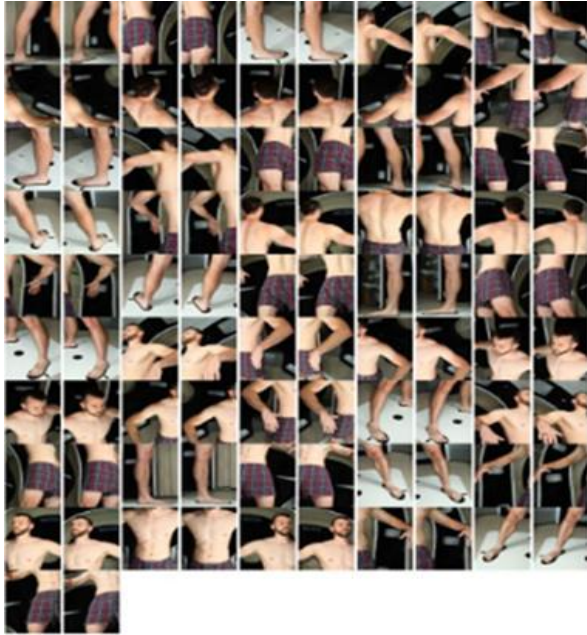
+



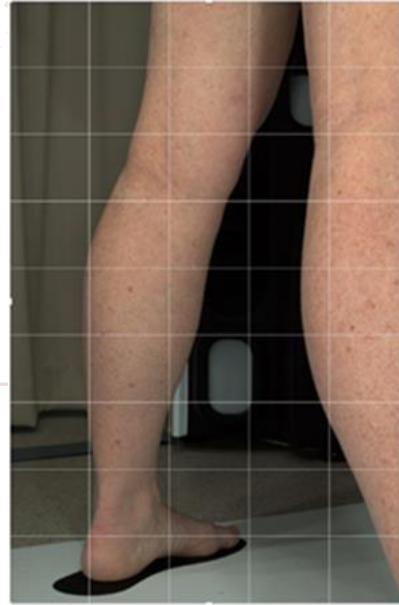
The VECTRA 3D Total Body Photography (Canfield Scientific)



What images are used (how is privacy protected)?



Step 1: Instead of using the 3D avatar, we will use the 2D photos taken by the individual VECTRA cameras



Step 2: A computer program will be used to detect and blur identifying features, including faces and tattoos.



Step 3: 'Cut up' each of the images into smaller tiles showing a small section of skin. These small tiles will be shared with **iToBoS** partners for annotation.



DICOM

◀ 16 / 579 ▶



Restart Workflow



53%



1/1

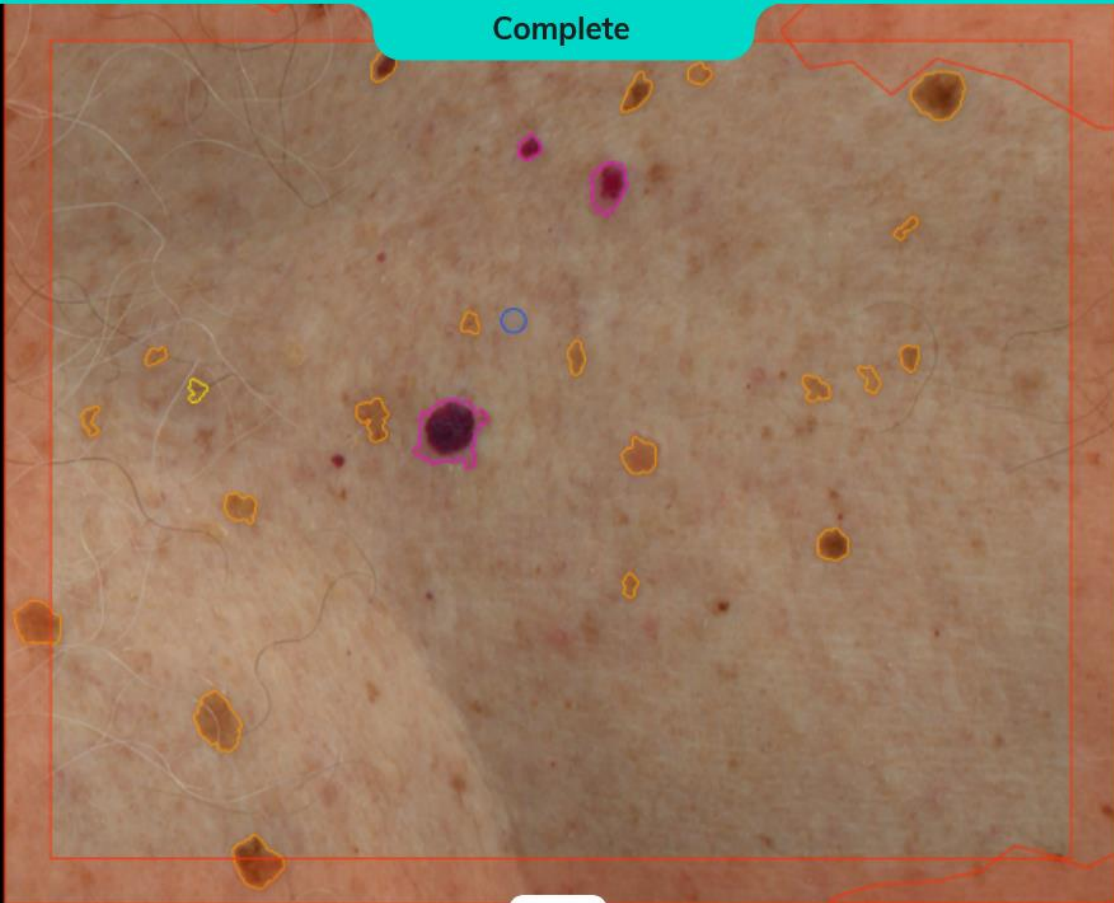


All

579 ▼



Complete



Annotations

Issues



SD 1

ruler

brown

brown

brown

brown

brown

Tags

You can't add tags on completed stage

Type to search or add a tag

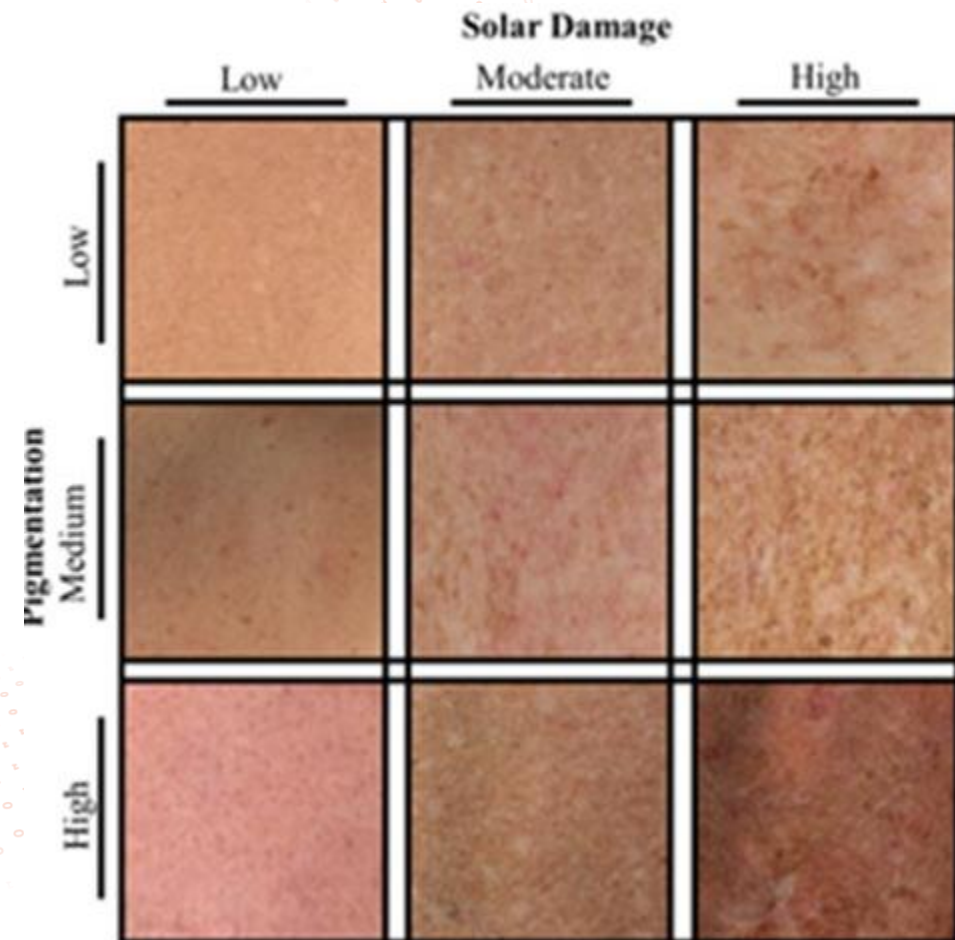
Sun/Solar Damage

Each tile needs to be evaluated for level of sun damage, using one of the following Tags. Use picture guide

SD1: Low/none sun damage

SD2: Moderate sun damage

SD3: Severe sun damage



Sun Damage examples

SD1: Low



SD2: Moderate



SD3: Severe



What will the Questionnaire Include?

The questionnaire has 45 questions over four categories and should take no longer than 15 minutes to complete. The information collected will be used to develop computer tools for the iToBoS to automatically profile individual risk of melanoma.



Demographics: your age, year of birth, sex, country of birth/residence, height, weight, marital status, education level, occupation status and ancestry.



Skin Cancer History: number of previous melanomas/BCCs/SCCs and age of diagnosis, number of benign lesions excised, family history of melanoma.



Sun/Health Behaviour: occupation (indoor/outdoor), frequency of skin checks, sunburn history, sunbed use, sunscreen use, smoking status and history, current (significant) medical treatment.



Phenotype Information: hair/eye/skin colour, skin type (easily burns/tans), freckles and naevi density.

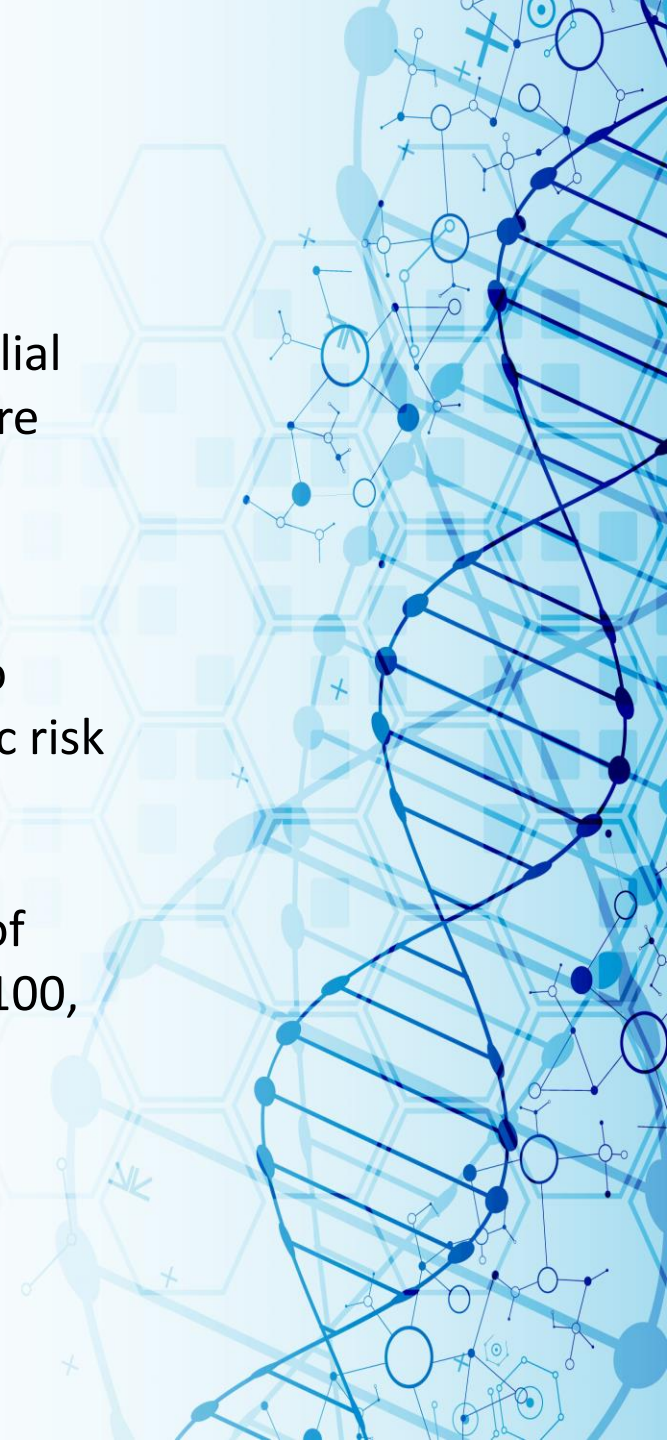
What Genetic Information will be used?

For study participants that have a personal and family history indicative of familial melanoma, we can offer panel genetic testing of over 10 known genes to explore this. Mutations in these genes are associated with a >50% lifetime risk of melanoma.

For most participants we will look at polygenic risk for melanoma. This refers to cumulative risk associated with low and medium risk genetic variants. Polygenic risk is estimated to contribute as high as 30% of melanoma susceptibility.

For the iToBoS Study, the two clinical sites (Barcelona Hospital, and University of Queensland), will create a '**Genetic Risk Score**' presented as a number from 0-100, and will not include any actual DNA sequence, and therefore not identifiable.

We would like to use this final Genetic Risk Score in the development of iToBoS computer tools to assist with risk profiling.



Clinical Data Acquisition Study



- 250 Participants
- Retrospective (contacting past research participants)
- Online consent procedure
- Consent to use previous Total Body Images, and Genetic Samples
- One-off Online Questionnaire

- 250 Participants
- Prospective
- Recruited during standard skin examinations at Barcelona Hospital Clinic
- Participants undergo Total Body Photography, complete a questionnaire, and provide saliva sample.

What next? → **Clinical Validation Study**

(months 35 – 48 (Feb 2024 – March 2025))

- **VECTRA Clinical Feasibility study:** 200 new participants from UQ, and 50 from Barcelona Hospital Clinic. Similar data collected to validate the iToBoS AI Cognitive Assistant (lesion analysis, lesion change in sequential images, and individual risk profiling).
- **iToBoS Total Body Scanner:** 75 participants from Barcelona Hospital Clinic, and 75 from University of Trieste (Italy). Two objectives: build a new training dataset to adapt and train the AI Cognitive Assistant for iToBoS Scanner, and to compare image quality/usability between VECTRA and iToBoS.

Questions and Feedback
Welcome 😊 😊 😊



“This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 965221”

Thank you

iToBOS

www.itobos.eu