

# Multispectral and autofluorescence RGB imaging for skin cancer diagnostics

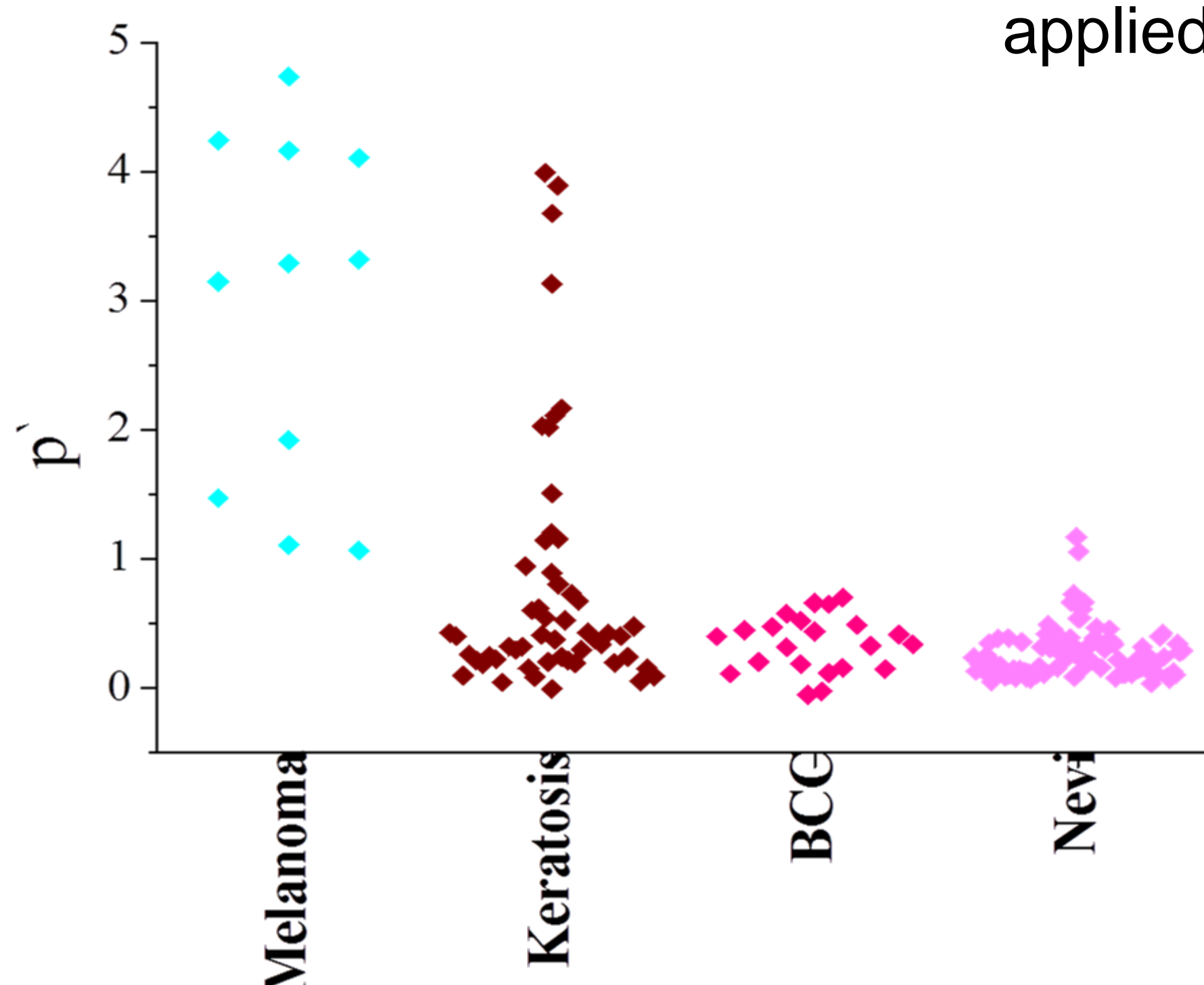
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A combination of two skin imaging methods – diffuse reflectance and autofluorescence – has been applied for skin cancer diagnostics



Images of different skin neoplasms including distinguishing

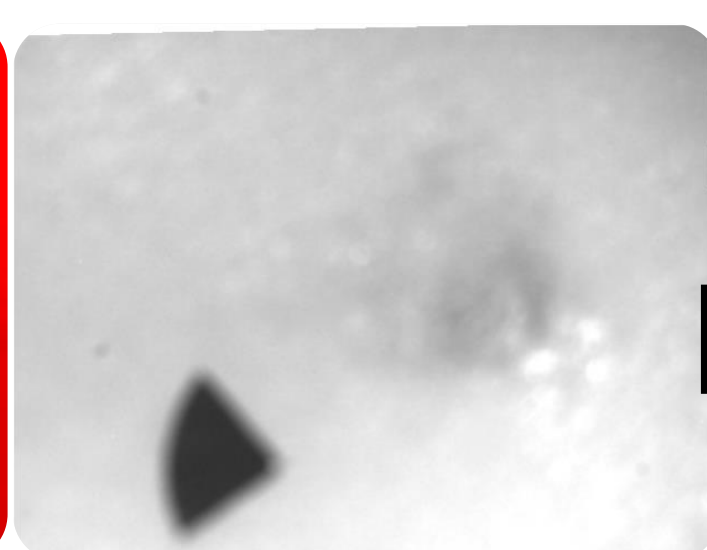
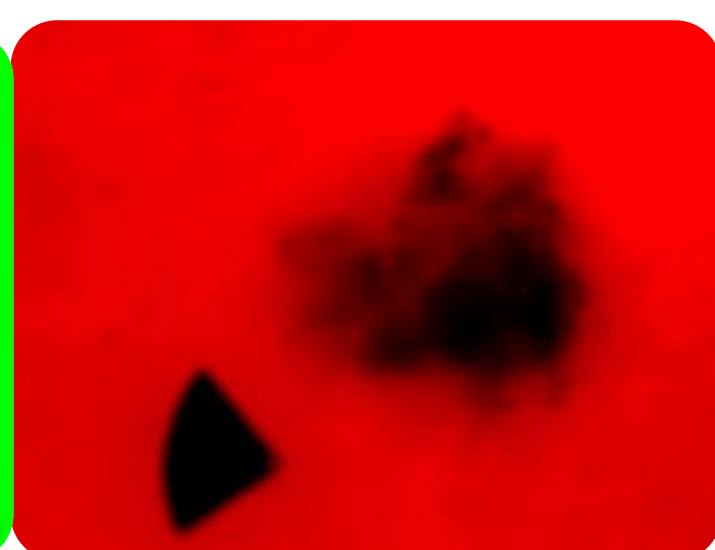
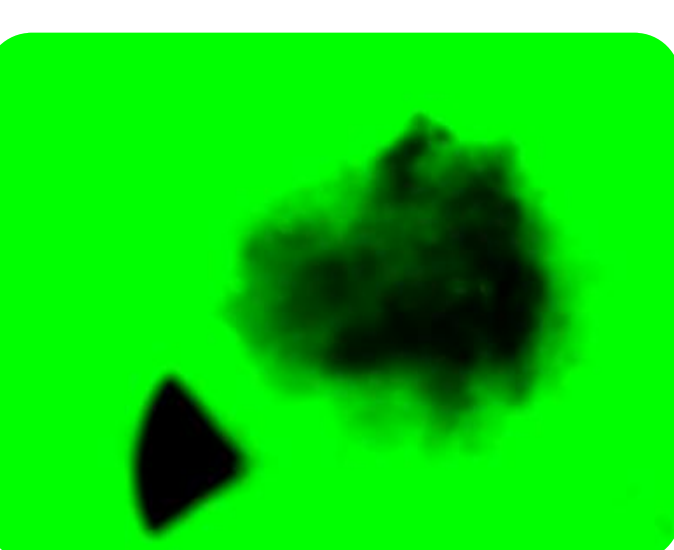
- 11 melanoma (3 histologically confirmed cases)
  - 21 keratosis (dermatologically confirmed cases)
  - 23 nevi (dermatologically confirmed cases)
  - 18 basal cell carcinomas (2 histologically and 16 dermatologically confirmed cases)
- have been collected and analyzed.

526 nm

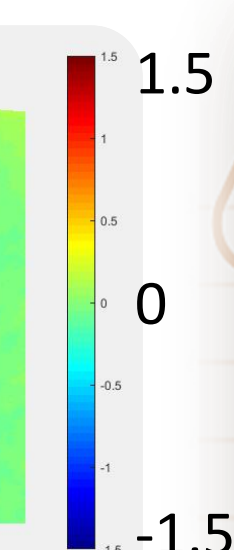
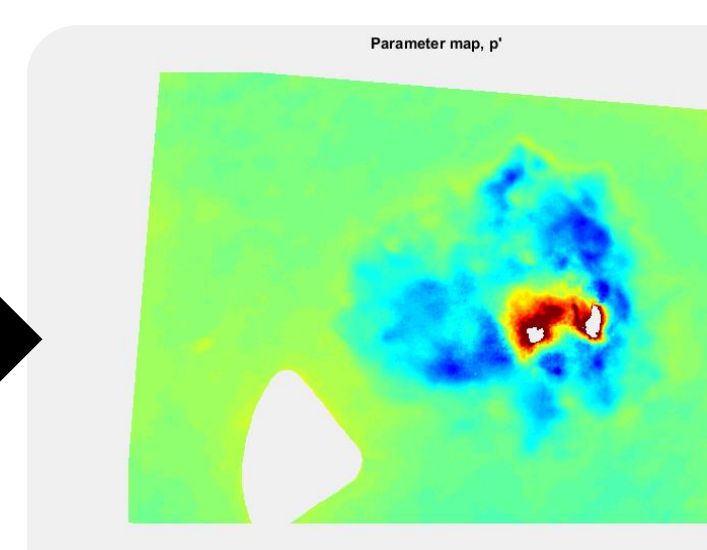
663 nm

964 nm

mapping



AF



526 nm, 663 nm, and 964 nm LEDs were selected for diffuse reflected imaging

405 nm LED excitation were used for skin autofluorescence measurements

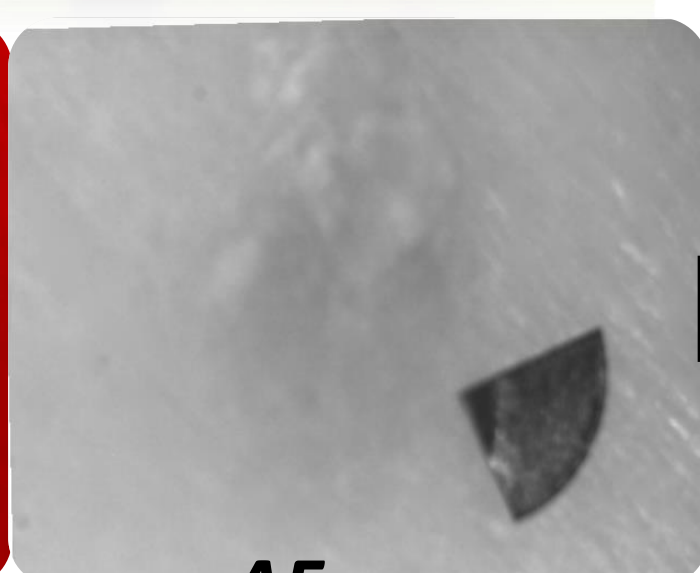
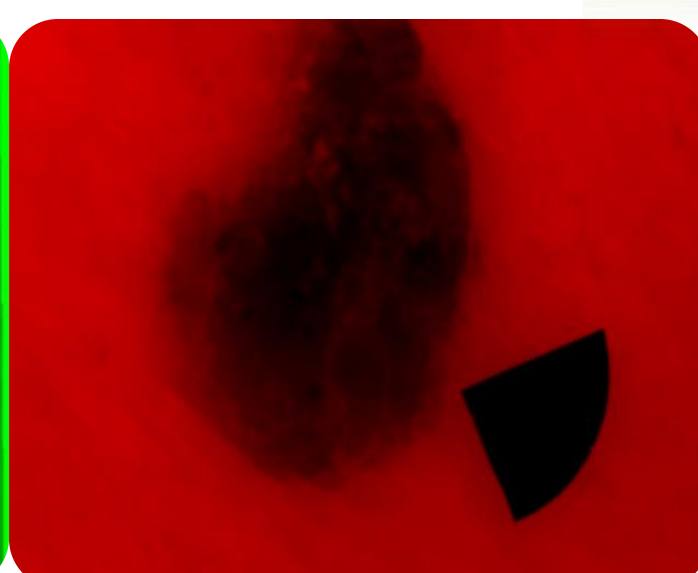
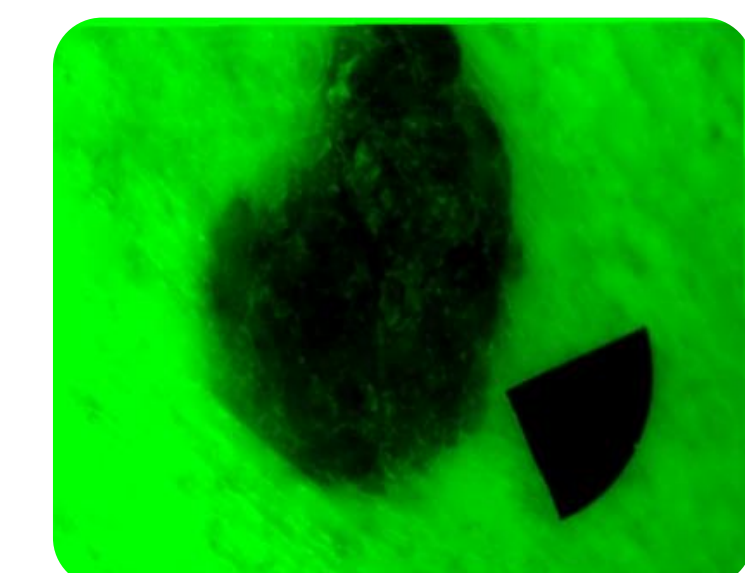
**Melanoma**

526 nm

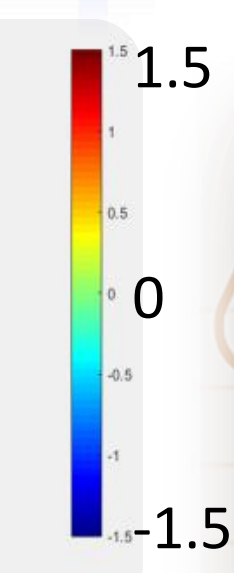
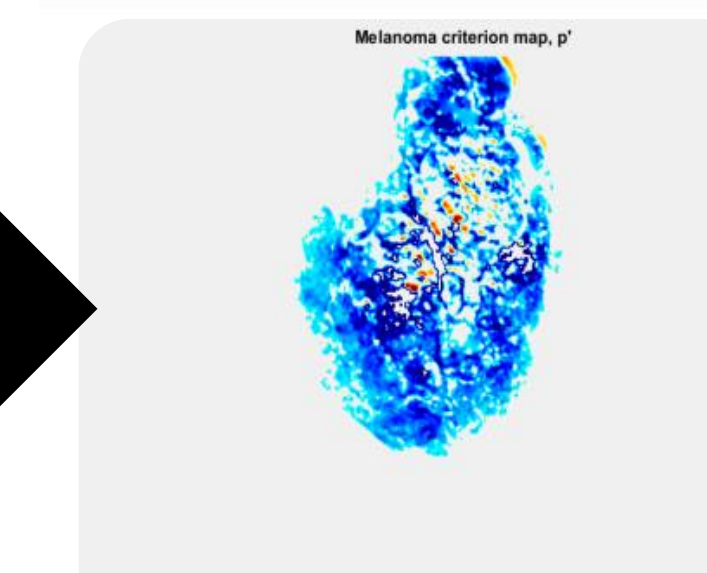
663 nm

964 nm

mapping



AF



The combination of these two methods with calculated  $p'$  criterion for diffuse reflected imaging and  $u$  for autofluorescence showed high accuracy for skin cancer diagnostics. Using this criterion is possible to discriminate melanomas from keratosis

**Keratosis**

IDS Camera

35mm lens

LED control module

520nm filter

Diffuser and polarizer film

4G and WiFi  
USB modules

Central control module

The prototype for data acquisition. Device consists:

- 4 x 405 nm LEDs; 4 x 526 nm LEDs; 4 x 663 nm LEDs; 4 x 964 nm LEDs
- 2 linear polarizers placed at right angles, diffuser
- 515 nm long pass filter
- 5Mpix IDS camera

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