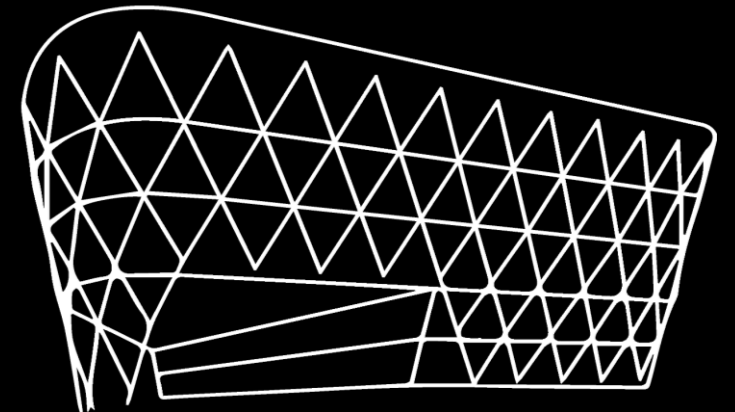


# Innovating for an ageing society: The Vision of the UK's National Innovation Centre for Ageing

3rd November 2020

Prof Patrick Bonnett

Advisor to UK Government on the Ageing Grand Challenge



# Why are we interested?

We all have a personal stake in this – we all want to **age well**



# A global issue: recent headlines from the media

"Ageing population a challenge for New Zealand"

"Canada is unprepared for the demographic time-bomb hurtling at us"

"Spain is expected to become the world's second oldest country by 2050"

"Fewer births, more deaths as Singapore population ages"

"Time for action on Australia's ageing population"

"PM states desire for more collaboration between UK and Nordic and Baltic experts on ageing"

# And a global market opportunity

By 2050 there will be 2.1 billion people over 60 - 21.3% of the global population.

The number of older adults in the UK is expected to double to 21.3 million; with over 80s the fastest growing age group.

**Demographic shift** – planning for a better, longer life, with aspirational products and services, is relevant to every sector, and through life, not just about “older people”.

**Immense global opportunity** – spending for older consumers will rise to 63% (£550 billion) by 2040 and maximising this opportunity gives a “longevity dividend” and boost to the GDP through greater productivity and participation.

**UK is placed to be best place, globally,** to innovate for healthy ageing and maximise opportunities for economic growth and citizen wellbeing from longevity economies.

# This opportunity and challenge identified by UK Government in 2017



"We will take action to and extend UK leadership in four early priority areas:

We will support new products and services for the growing global population of older people, meeting important social needs and realising the business opportunity for the UK"

# Reflecting a hugely significant UK consumer market

Over 50's in the UK hold:

- 68.3% of all UK household wealth (£8.1 trillion)
- 66.2% of all property wealth (£2.6 trillion)
- 77.3% of all financial wealth (£1.24 trillion)

# The Vision – why were we established?

The UK's **National Innovation Centre for Ageing (NICA)**, in Newcastle, brings together world-leading applied researchers, innovation and commercialisation specialists to work together with industry, the NHS, the public and private sector

We work to develop, evaluate and bring to market products, de-risking entry into the market and product launches for products and services which **optimize health and wellbeing as we age.**

# How do we do it? – the NICA approach

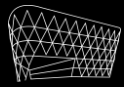
Applying **Ageing Intelligence** to data

Enabling businesses to generate **insights into customer needs & wants**

Thereby capitalising on **new opportunities** and generating **new revenue streams**

All informed by deep insight into what customers **need** and **want** across the globe – products of aspiration, not desperation – not the 'beige and boring' that dominate the market place





# How do we do it? - The Business Approach

Providing insights, the Ageing Intelligence™ approach allows you to capitalise on longevity economies



**AI (Ageing Intelligence)**  
Powered insights

Applying Ageing Intelligence to data, enabling you to generate new insights



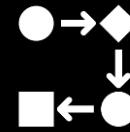
**Create** new intelligent products and services

Lead in thought, data acquisition and integration



**Enhance & enhanced by** human experience

Personalised user experiences and generation of insights into customer needs and wants



**Empower new businesses**

Capitalise on new opportunities, generate new revenue streams & de-risk investment

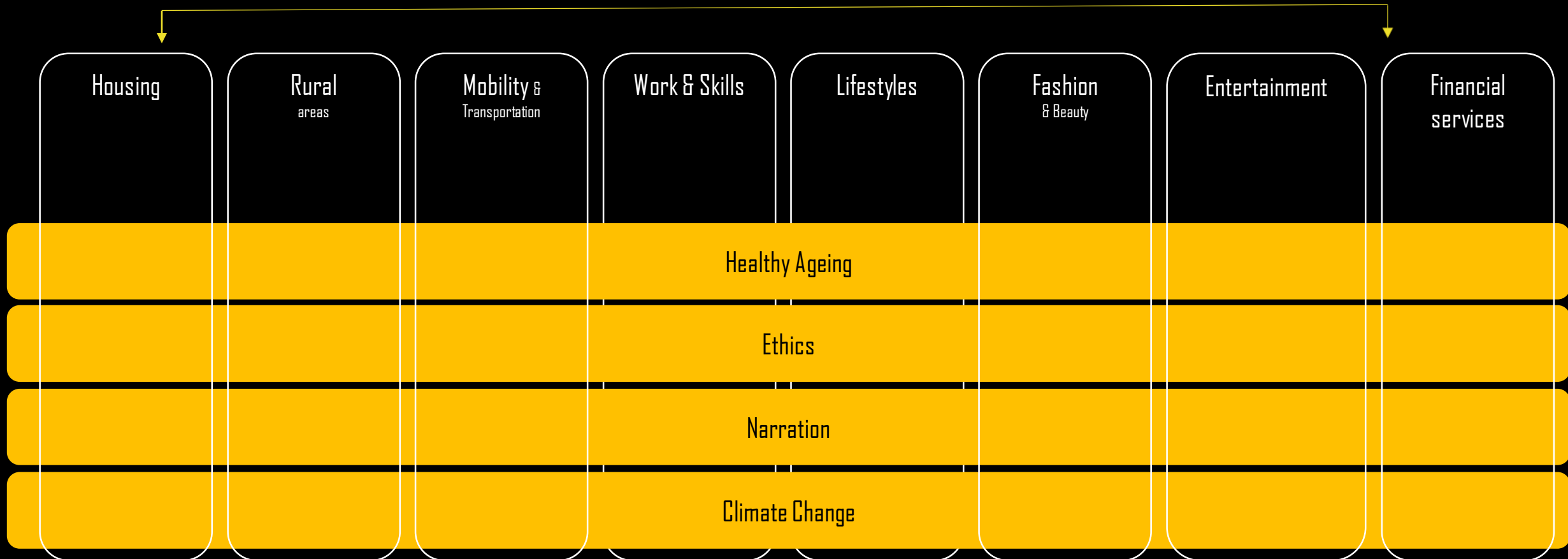


**Global reach**

Global application drawing on international expertise and perspectives

# The Focus

We focus on 8 key industry sectors or verticals with 4 key horizontal themes





# The Catalyst: Home to the UK's National Innovation Centre for Ageing

A **£50M Innovation Centre** opened in 2020, funded by UK Govt. and Newcastle University.

10,000m<sup>2</sup> or 100,000 sq ft of space

Home to **NICA** and the **National Innovation Centre for Data (NICD)**

Providing specialist facilities including TED Style Theatre, Consumer Insights Suite, Decision Theatre and commercial office space for businesses seeking to enter, or operating in, the longevity economy.

Including a growing skin ageing cluster with companies such as HexisLab and Skin Life Analytics

[www.thecatalystnewcastle.co.uk](http://www.thecatalystnewcastle.co.uk)





## The Catalyst



### Fourth floor

- Commercial offices
- Board Room
- Kitchen and break out spaces
- Meeting rooms



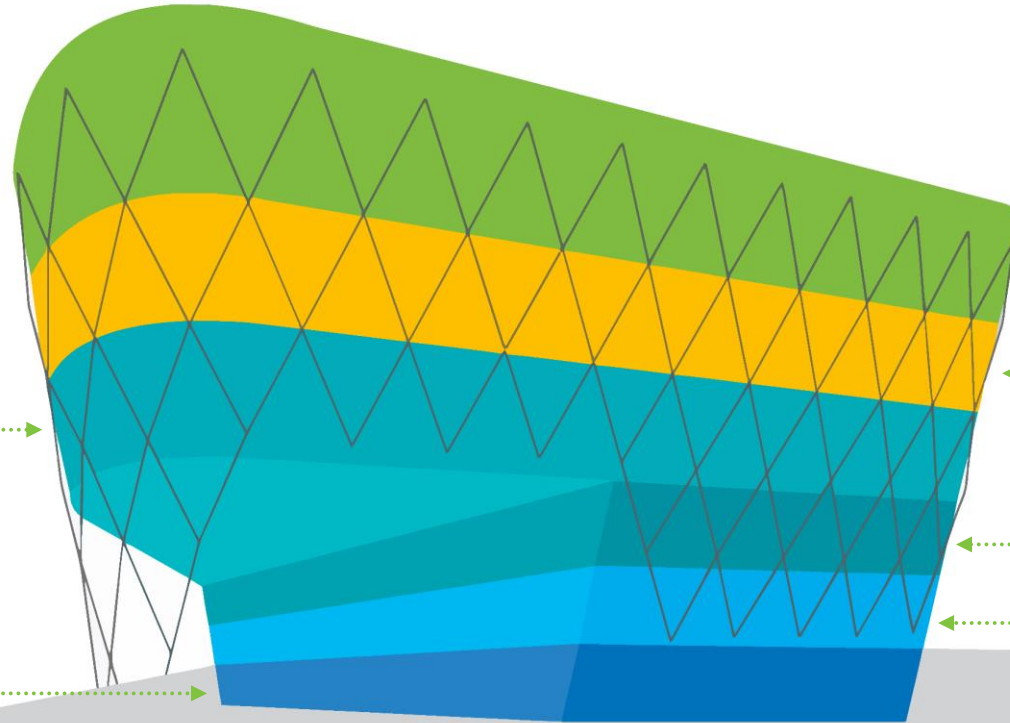
### Second floor

- NICD and partners in data innovation
- Large collaboration space
- Meeting rooms



### Lower ground

- Cycle store
- Shower room
- Mobility scooter charging



### Third floor

- NICA and partners in ageing innovation
- NIHRIO
- Meeting rooms
- Break out spaces



### 1<sup>st</sup> floor - mezzanine

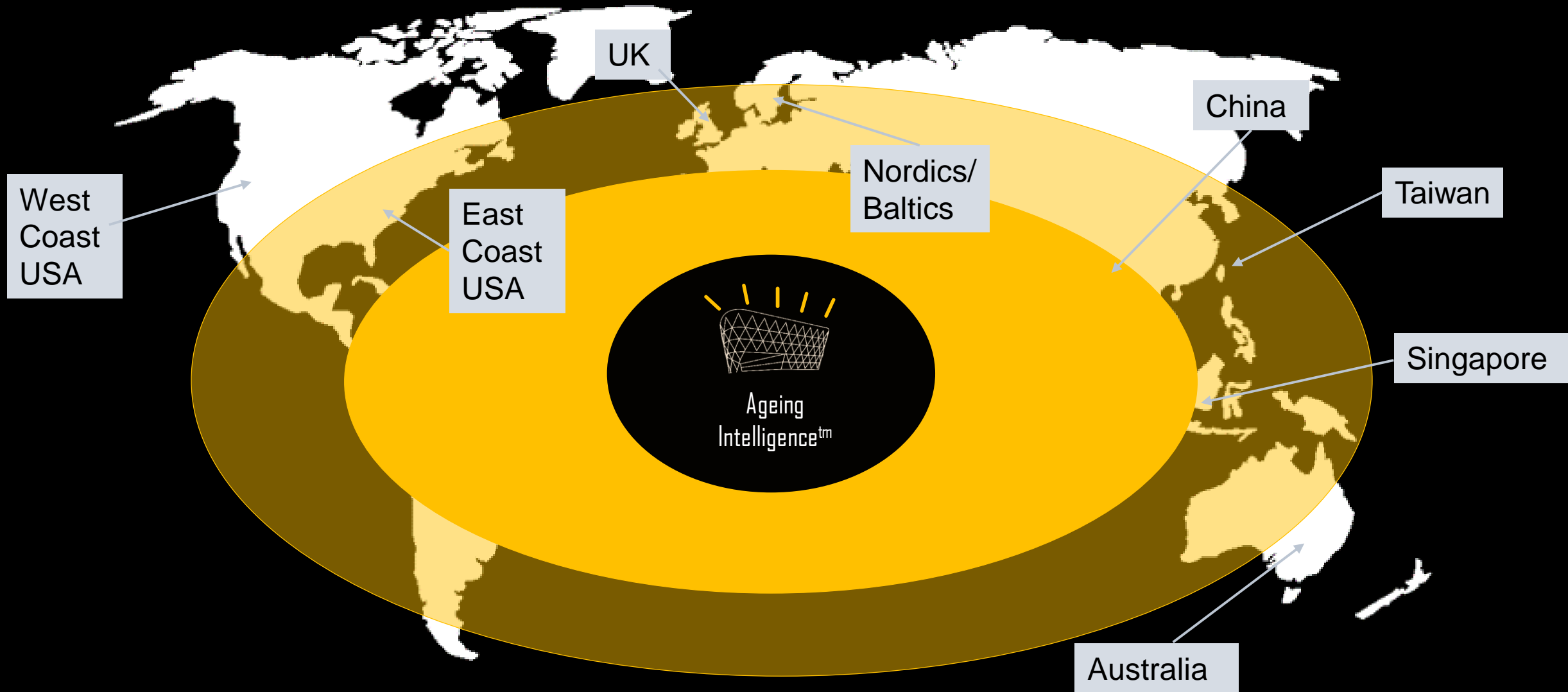
- Consumer insights room
- Decision theatre
- Seminar rooms
- Meeting rooms



### Ground floor

- Theatre
- Public exhibition space
- Cafe
- Workshop and demonstration space

# Global by **design, collaborative** by instinct





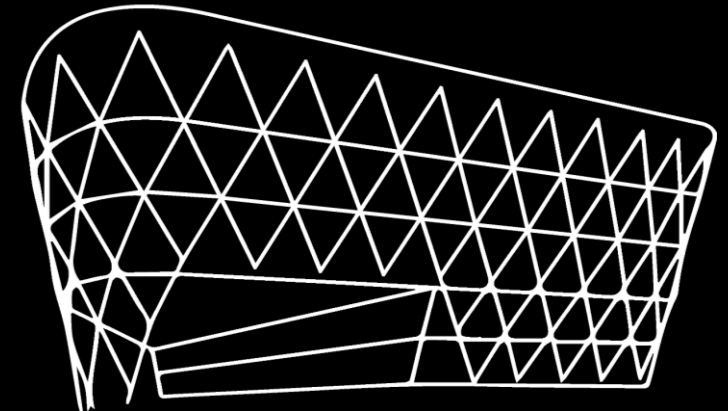


# Innovation Example: Skin Life Analytics

**Prof Mark A Birch-Machin**  
([mark.birch-machin@newcastle.ac.uk](mailto:mark.birch-machin@newcastle.ac.uk))



Prof of Molecular Dermatology,  
UK National Innovation Centre for Ageing,  
and Faculty of Medical Sciences, Newcastle University, UK



# Theories of Ageing

The wear and tear theory (Weismann, 1882)

The rate of living theory (Pearl, 1928)

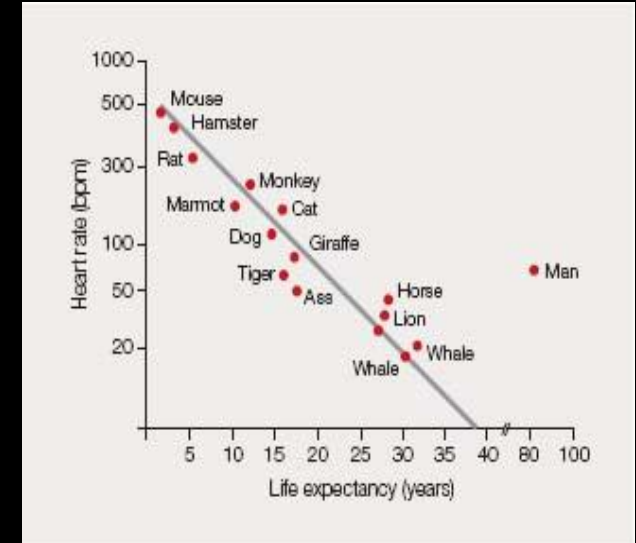
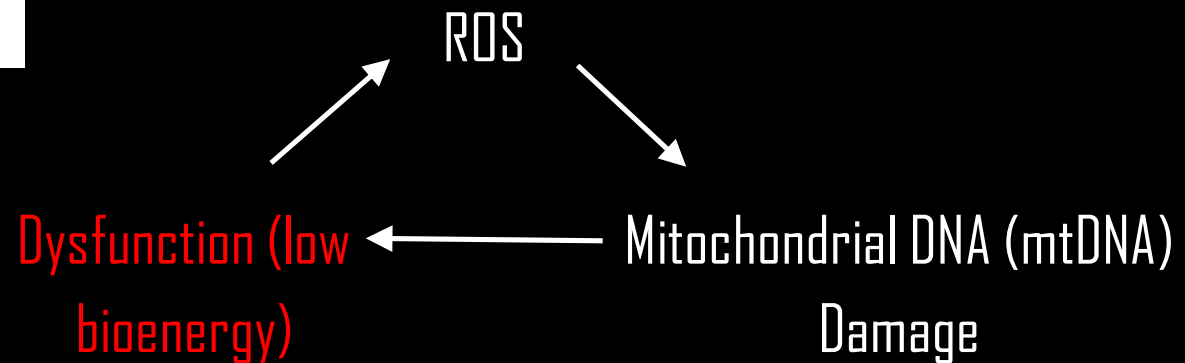
Free radical theory (Harman, 1956), (pigeons vs rats: longer life span- similar metabolic rates)

**Mitochondrial theory of ageing** (bioenergy↓ free radicals↑)

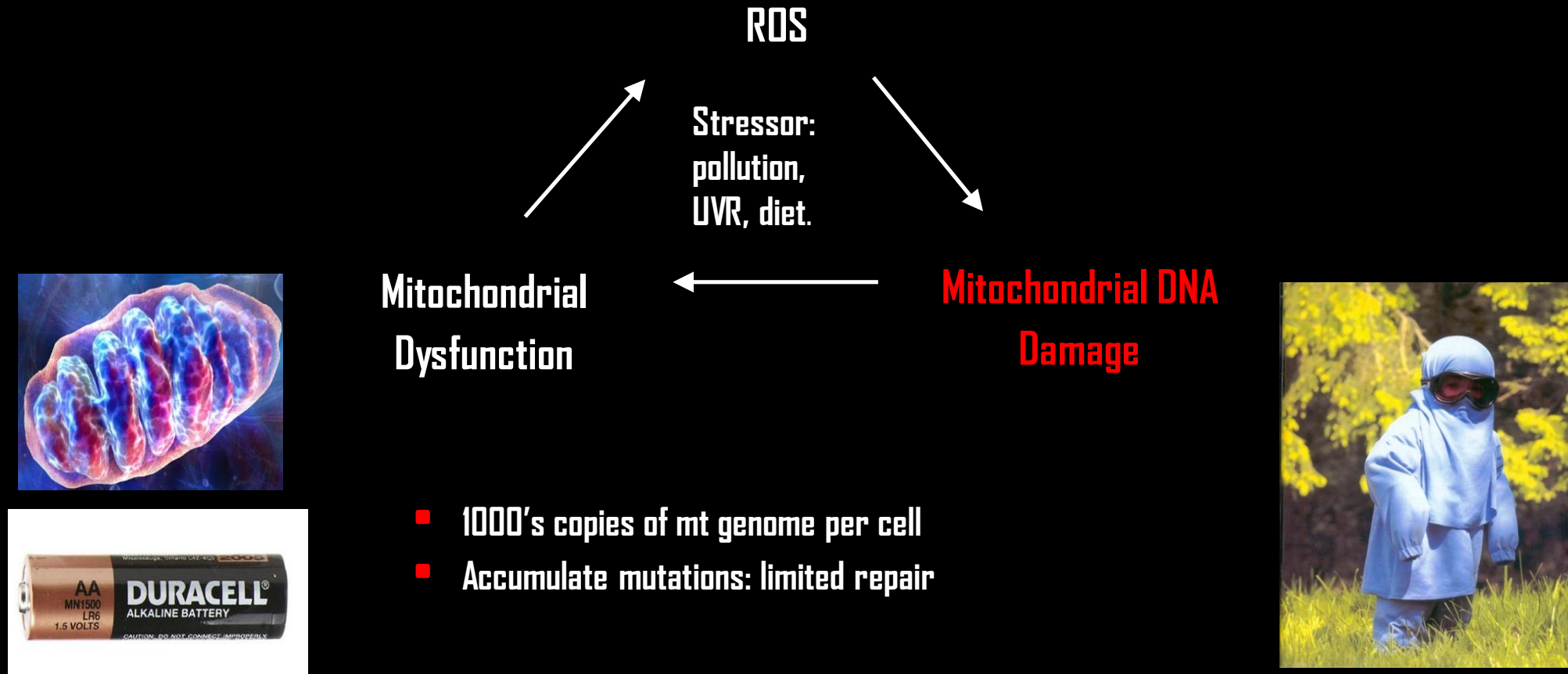
(Tired or Fatigued Skin)



Vicious Cycle Theory



# Mitochondrial theory of ageing- Vicious cycle



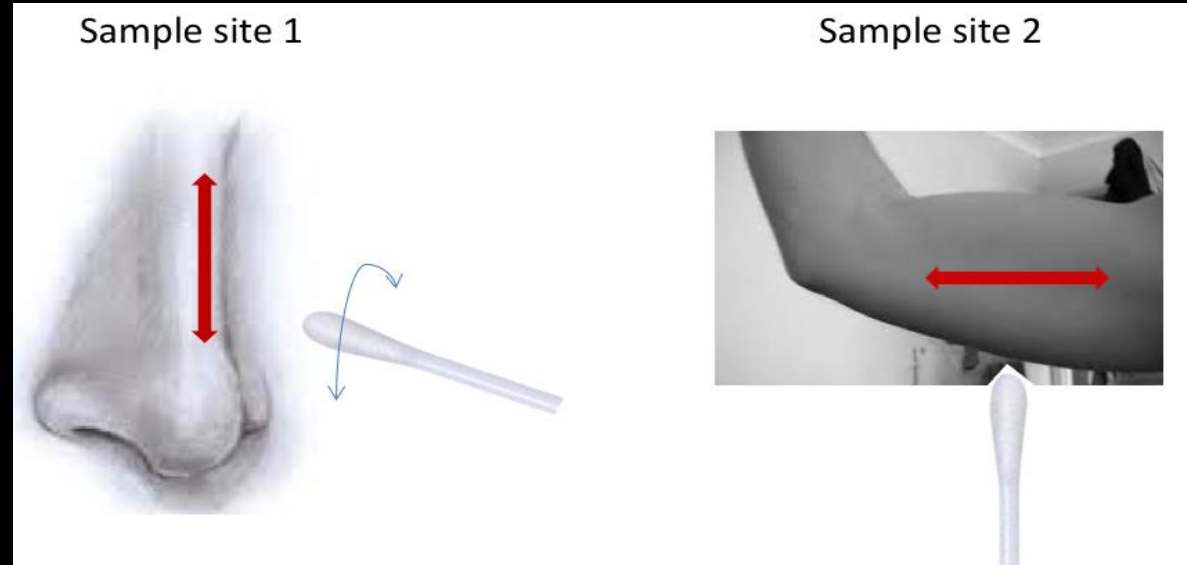
# MtDNA damage and Sun-Exposure in Human Skin

UVR → mtDNA damage → Limited repair  
→ Accumulation of damage →  
biomarker of Sun-damage in skin (**Sunburnt DNA**)

Increasing tower of UV-induced mtDNA damage



# 1) Simple cotton swab test measures damaged mtDNA in human skin



**Mitochondrial theory of ageing** (bioenergy ↓ free radicals ↑ DNA damage ↑)



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## A year in the life of my skin: Beauty expert Alice Hart-Davis took part in an experiment to find out the real anti-agers

By ALICE HART DAVIS

**PUBLISHED:** 00:03, 7 June 2015 | **UPDATED:** 00:03, 7 June 2015



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**When beauty expert Alice Hart-Davis took part in a pioneering 12-month experiment to discover which lifestyle factors had the most ageing effects on her skin, the results surprised even her...**



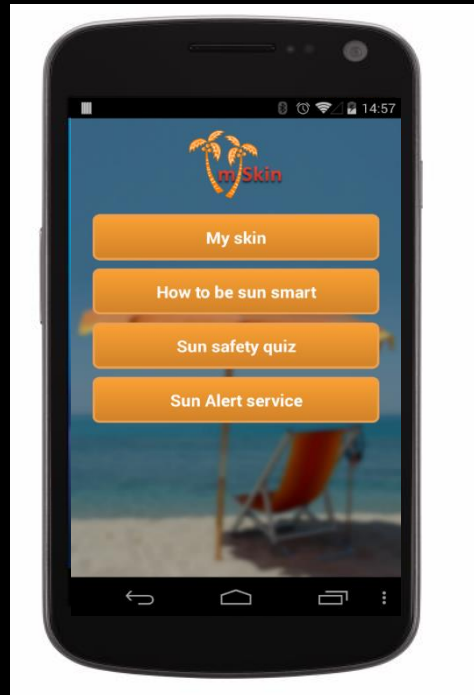
## 2) Lifestyle Intervention and 3) Facial Imaging

JMIR RESEARCH PROTOCOLS

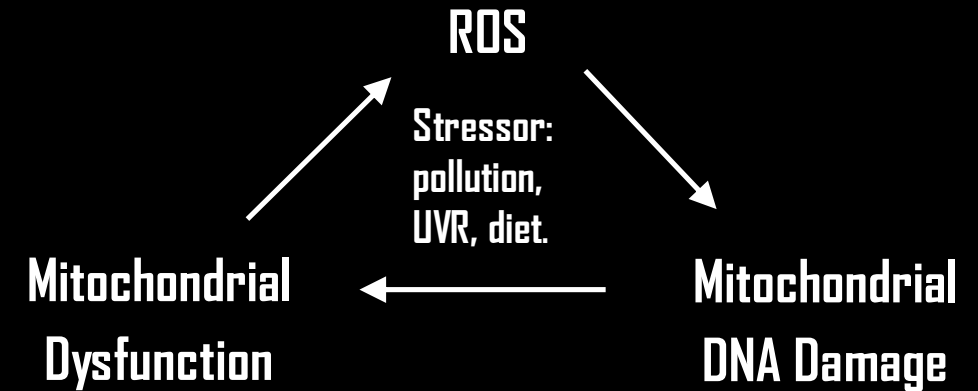
Rodrigues et al

Original Paper

Systematic and Iterative Development of a Smartphone App to Promote Sun-Protection Among Holidaymakers



**Lifestyle Interventions:  
Questionnaires, Apps,  
Nutrition....**



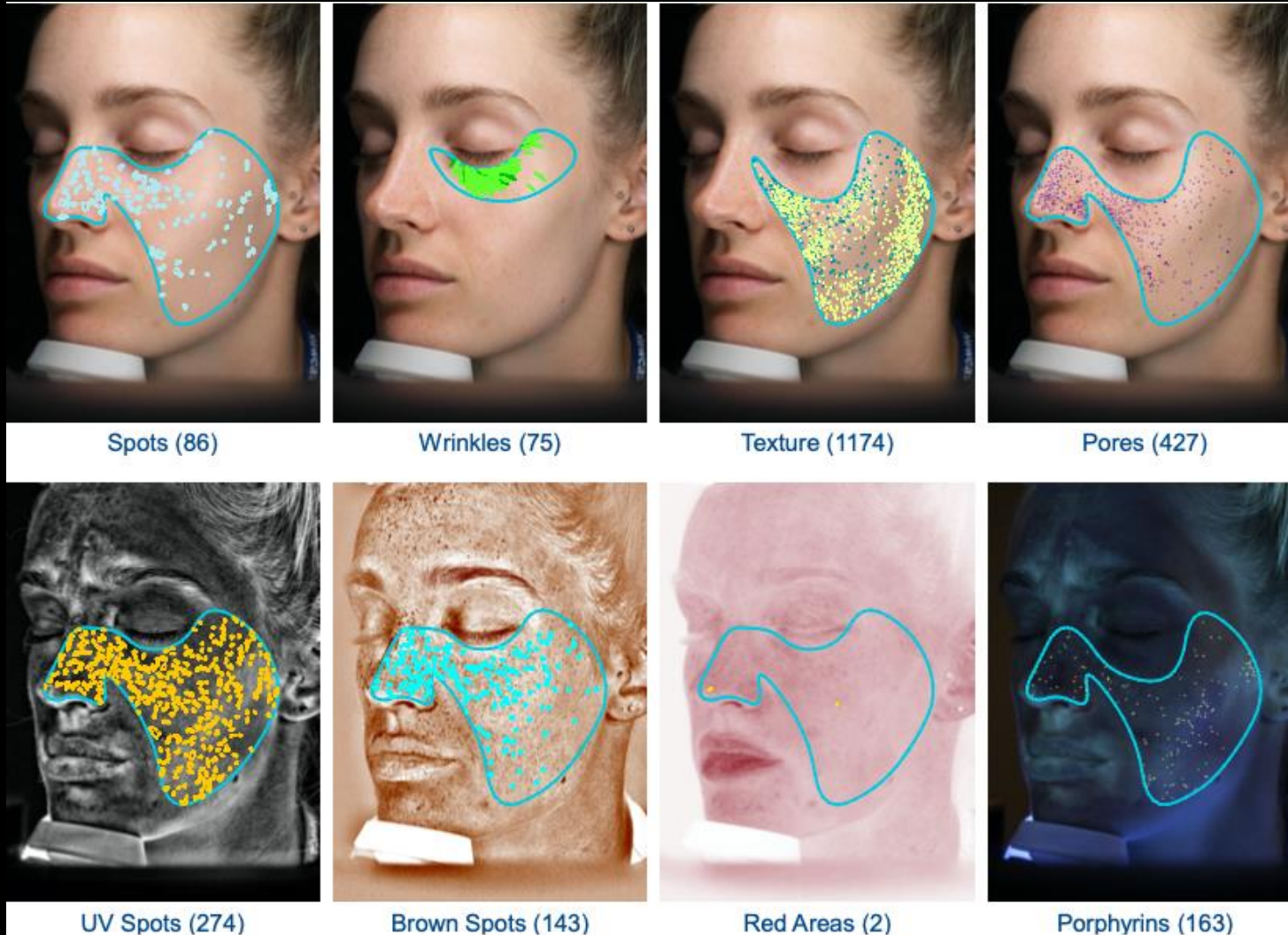
# VISIA Complexion Analysis System Gen 7 vs Previous Generation





# Feature count

## Results



# Percentile

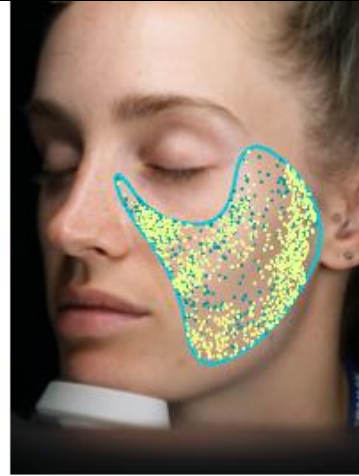
## Results



Spots (92%)



Wrinkles (24%)



Texture (30%)



Pores (37%)



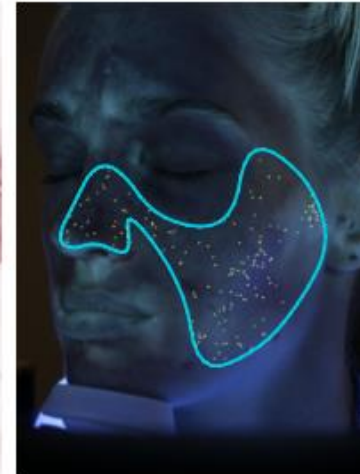
UV Spots (75%)



Brown Spots (13%)



Red Areas (76%)



Porphyrins (96%)



# Score

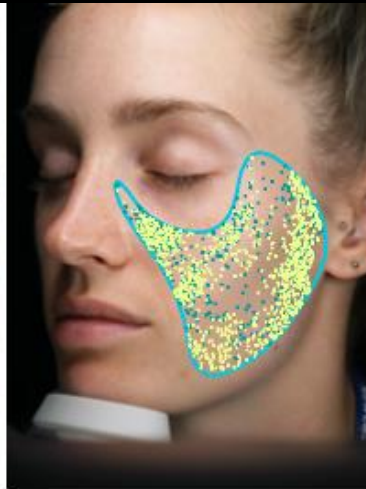
## Results



Spots (20.170)



Wrinkles (27.573)



Texture (7.697)



Pores (10.435)



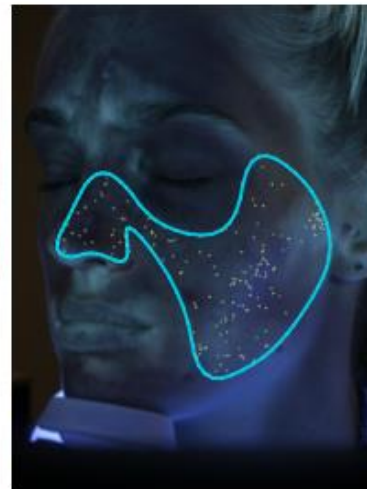
UV Spots (21.549)



Brown Spots (23.365)



Red Areas (8.037)



Porphyrins (1.690)

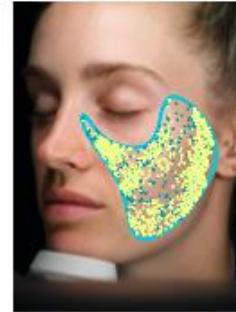
# TruSkin Age



Spots (86)



Wrinkles (75)



Texture (1174)



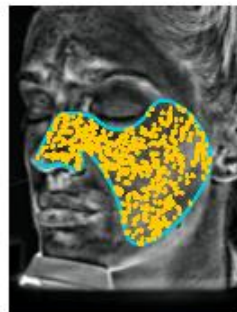
Pores (427)

your actual age

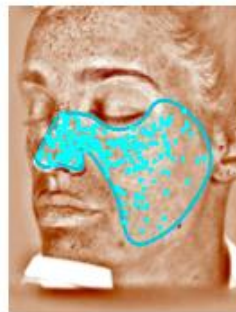
22

your TruSkin Age®

23



UV Spots (274)



Brown Spots (143)

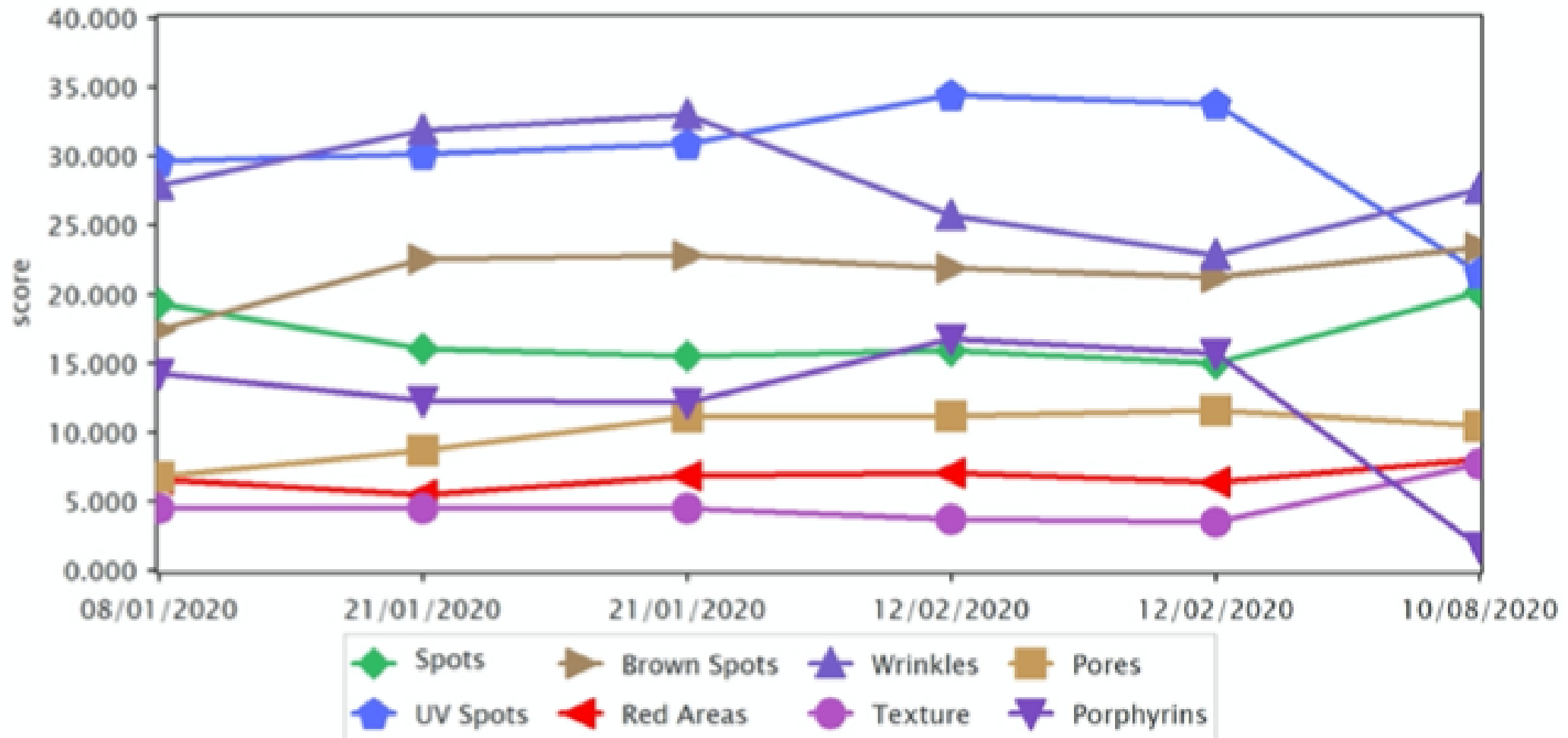


Red Areas (2)

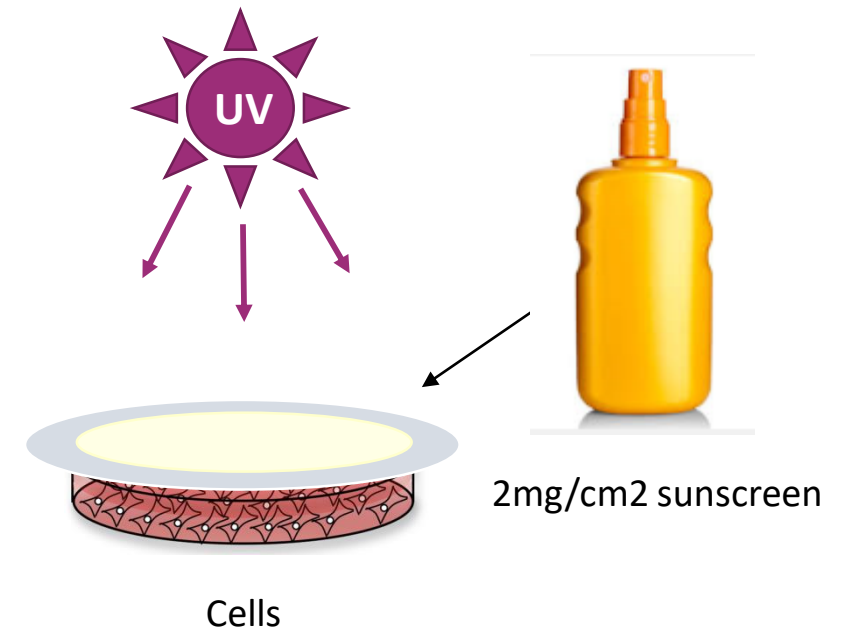
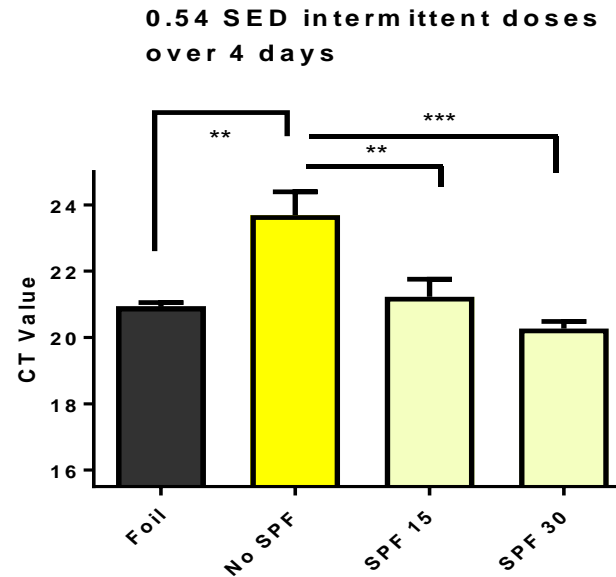
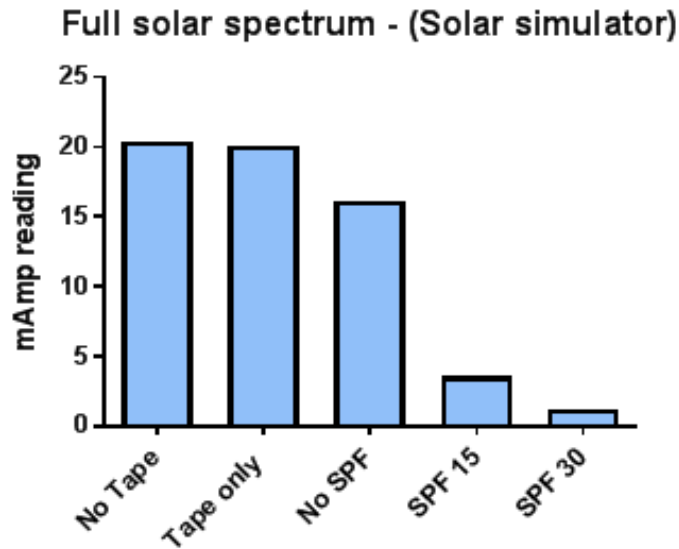


Porphyrins (163)

# Feature variation between sessions



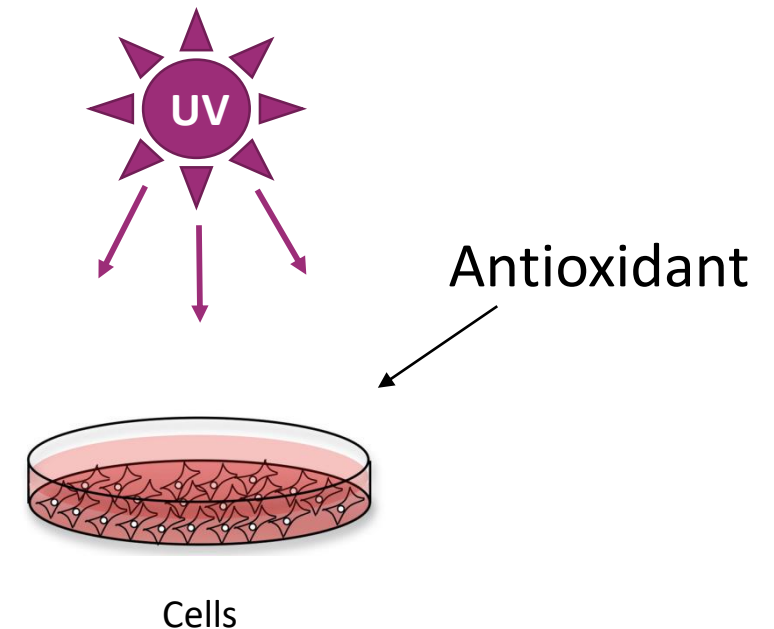
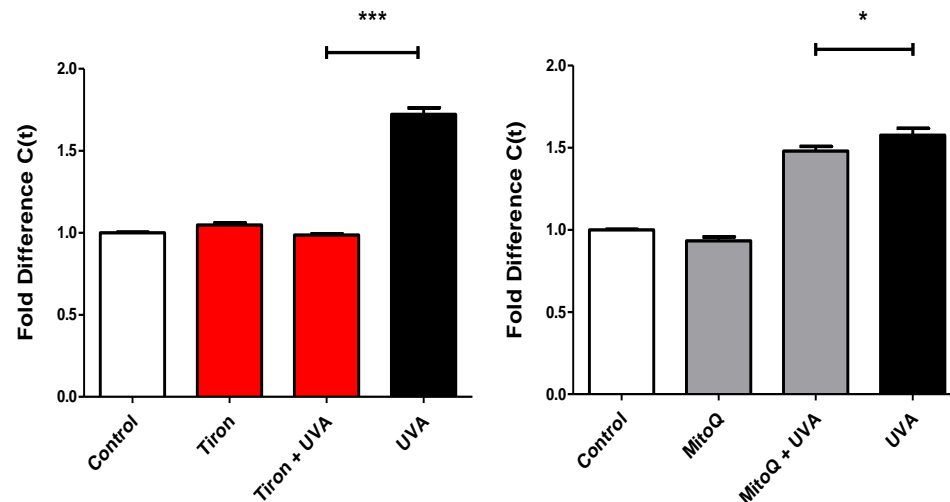
# 4) Sunscreen and Antioxidant Protection against MtDNA Damage



# 4) Sunscreen and Antioxidant Protection against MtDNA Damage

*The FASEB Journal* • Research Communication

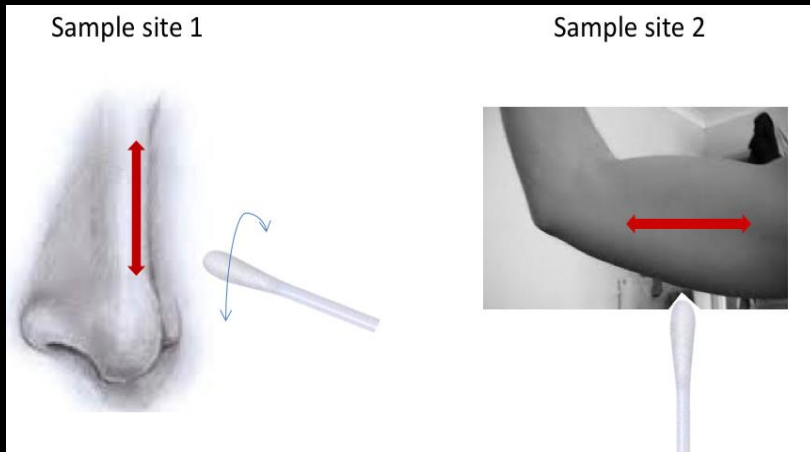
Antioxidant	H <sub>2</sub> O <sub>2</sub> (%)	P values	UVA (%)	P-Values
Tiron	100	*** (P<0.001)	100	*** (P<0.001)
Resveratrol	22	* (P<0.05)	22	*** (P<0.001)
NAC	20	n/s	8	n/s
Curcumin	16	* (P<0.05)	8	* (P<0.05)





# Skin Life Analytics

## 1) Skin swab



## 2) Lifestyle consultation: Questionnaire, App

## 3) Facial imaging

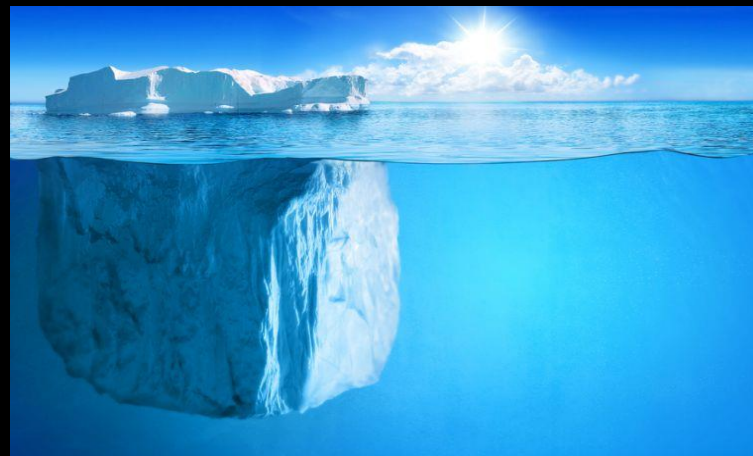


## 4) Testing- Cosmetic Brand partners + Cosmetic Dermatologists





# Skin Ageing: surface and below



# NICA: Ageing Intelligence<sup>®</sup>

## Ageing Well Together

For more information or to speak to a member of the team **contact:**

**Patrick Bonnett** ([patrick.bonnett@ncl.ac.uk](mailto:patrick.bonnett@ncl.ac.uk))

**Mark Birch-Machin** ([mark.birch-machin@ncl.ac.uk](mailto:mark.birch-machin@ncl.ac.uk))