



# **The Scentronome™**

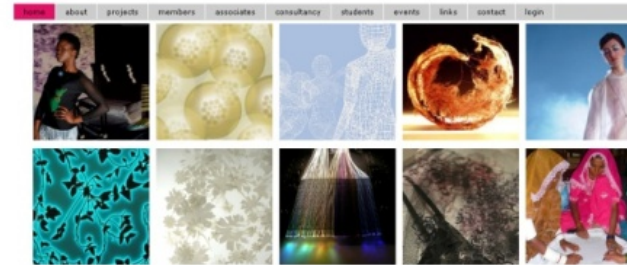
***Wearable Therapeutic Mood Monitoring Tools for  
Bipolar Affective Disorder***

***Jenny Tillotson PhD RCA FRSA  
Central Saint Martins | University of the Arts London***

University of the  
Arts London  
**Central**  
**Saint Martins**

**TEXTILE  
FUTURES  
RESEARCH  
CENTRE**  
UNIVERSITY OF THE ARTS LONDON

SEE THE FUTURE MATERIALISE



## Central Saint Martins College of Art & Design



Senior Research Fellow – School Of Fashion & Textiles  
Creative Director / Founder of CSM spinout company – Sensory Design & Technology Ltd



# Institute of Biotechnology – University of Cambridge



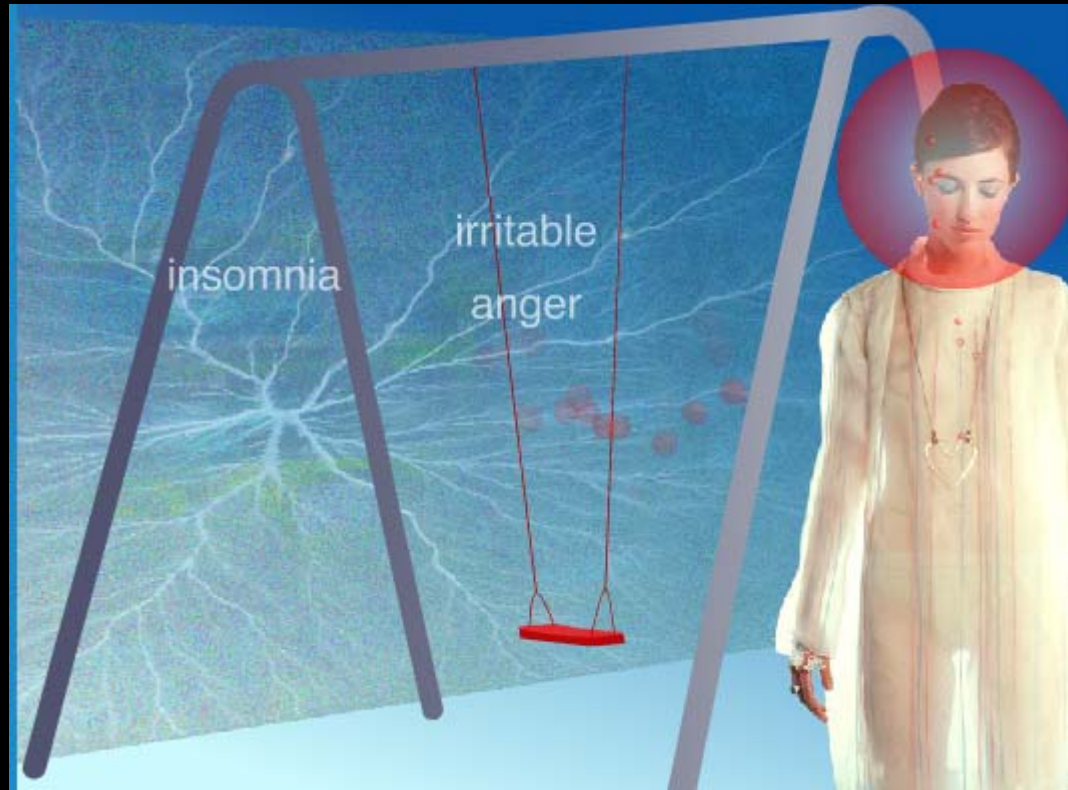
UNIVERSITY OF  
CAMBRIDGE



Research Associate – Institute of Biotechnology  
Creative Director /Founder – CEROMA Ltd (consumer products, cell phones, tablets)

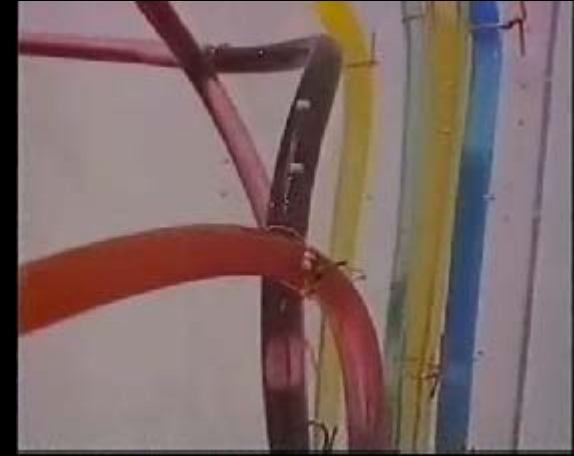
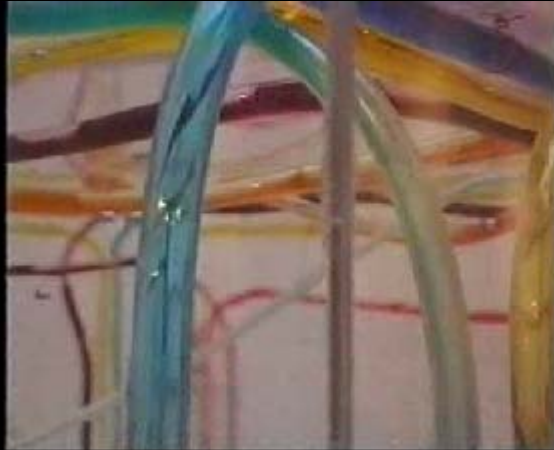
# Wearable Technology + Scent Creates Protective '*Scent Bubble*' To Help Manage Lifestyle Reduce Stress / Insomnia

*[ Sensitive + Sustainably ]*



*Scentsory Self Tracking | Stress Management tools To Reduce MOOD SWINGS*

# Originates from PhD at RCA 1997: *A 'Living Textile' Smart Second Skin*



*Target Emotional State with Colour Therapeutic Scent Delivery*  
*Wearable Technology and Wellbeing*

# Thierry Mugler: Fashion + Wellbeing

*“Fashion will change dramatically in the coming years  
It will be more **human** . . . .  
Closer to the needs of the people in terms of their  
**wellbeing**, not “well showing”*

*Thierry Mugler* 1980



International Fragrance Association (IFRA) reports increase in Health & Wellbeing trends

# *Design Mood-Enhancing Clothing: Emotional Support System*

Terrence  
HIGGINS  
TRUST



## **The “Smell of Death”**

- *HIV & Aids*
- *Fear of living and fear of dying*



## **Bipolar Affective Disorder**

- *Biological illness / Mood spectrum*
- *Extreme emotions / hyper sensitive*
- *Requires treatment*
  - *mood stabilisers / self care*
- *TRIGGERS: STRESS / INSOMNIA*
- *STIGMA attached*

# Motivation: Bipolar I + Bipolar II + 3 *kids*!



# Manage Life: Scent for Stress + Sleep



- **IFRA International Federation Association reports increase in health & wellbeing trends**
- **Evidence -based essential oils - proven to REDUCE STRESS AND IMPROVE SLEEP**
- 1/3 world estimated mental health problem
- 1 in 4 will experience mental disorder (UK)
- Bipolar Disorder - 254 million worldwide
- WHO - Depression escalating by 2020
- MIND – Increased **STRESS** in workplace
- **SLEEP** problem – 45% of the world
- 40 million Britons suffer from **STRESS** + anxiety
- **STRESS + SLEEP** are key bipolar triggers

# Scentsory Design® Projects

SmartSecondSkin

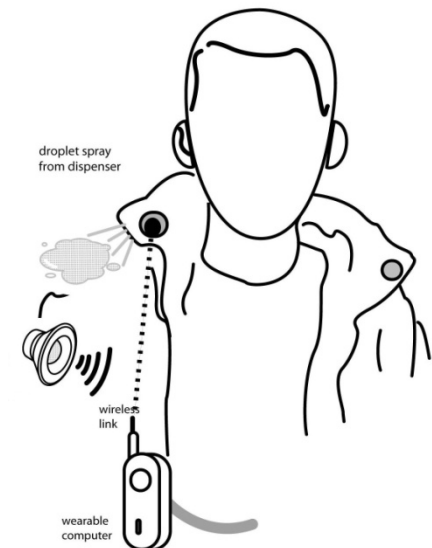


eScent®

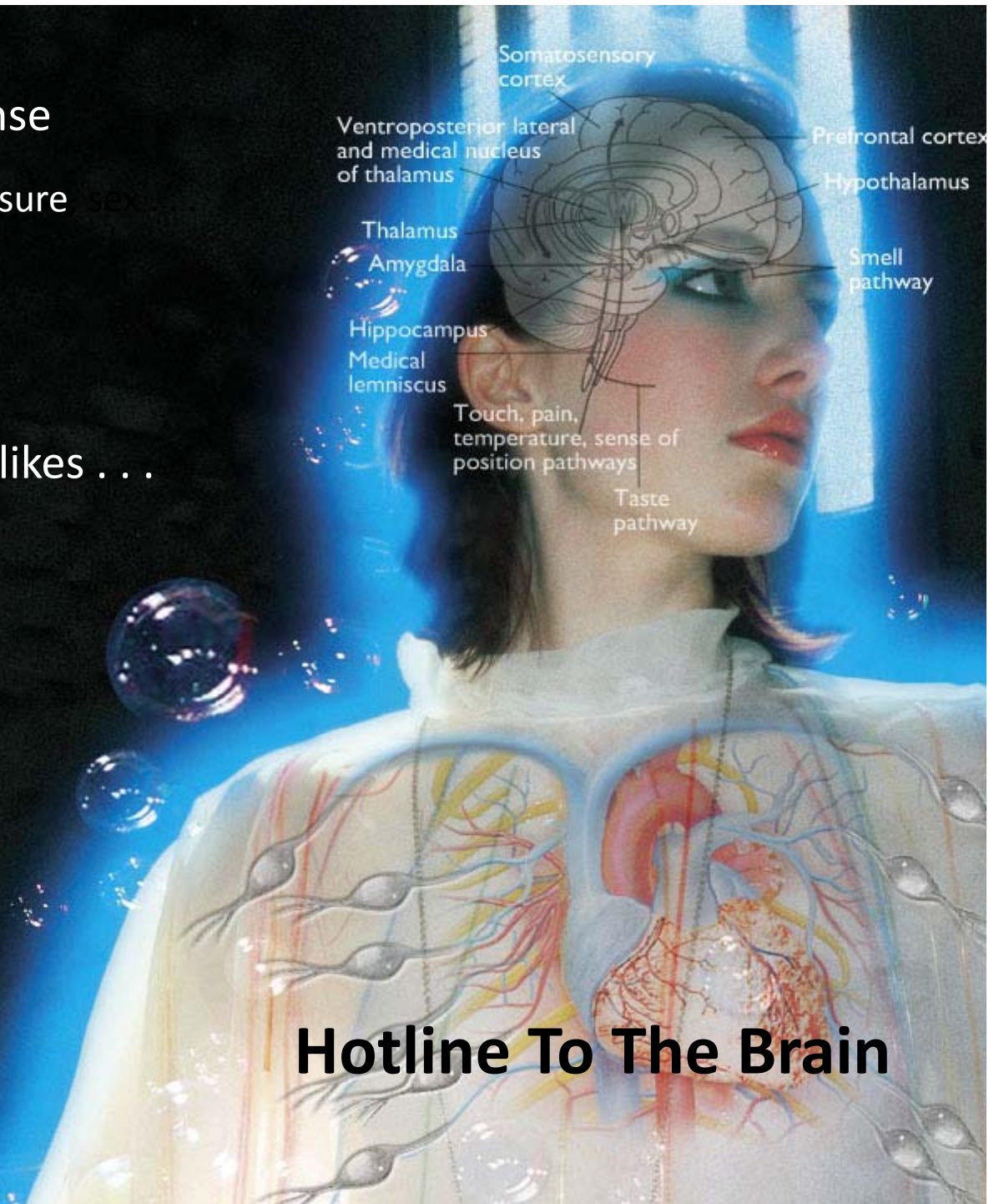


patent 046382.8

*'Wearable system and method for dispensing fluid in response to a sensed property such as biometric data from an individual or various ambient sounds'.*



- Smell: ancient primitive sense
  - > food, danger, survival, pleasure sex
- Evokes memories
- Access to feelings, likes, dislikes . . .
- Experience **EMOTIONS**
  - > positive = love / security
  - > negative = anger / fear
- Mood-enhancing effects:
  - Wellbeing
  - Performance
  - Behaviour
  - Learning / Creativity



**Hotline To The Brain**

# AROMACHOLOGY

*The Science of Fragrance || Regulates Mood*

## Reduce:

performance  
related stress

startle reflex

confusion

insomnia

heart rate

fear

## Balance:

Nervous system

## Stimulate

Adrenal cortex

## Soothe

Muscle stiffness



***“Fashion is the recognition that nature has supplied us with one skin too few – that a fully***

***S[C]IENTIENT BEING should wear its nervous system externally”***

J.G.Ballard 1994

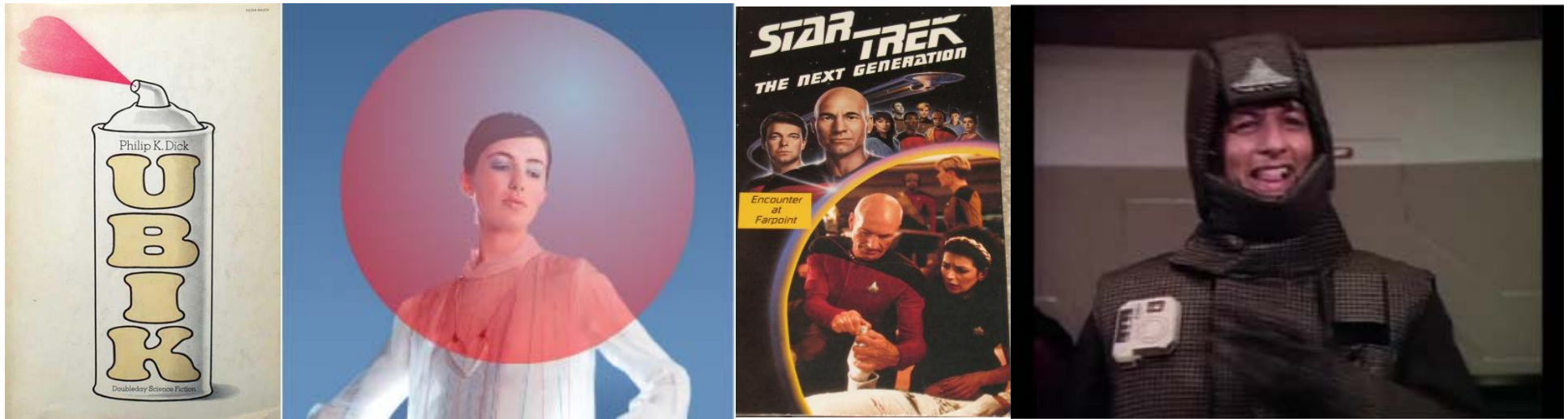


**SmartSecondSkin:**  
***a ‘living textile’ scent symphony***

electronic nervous system ‘sensitive skin’ that changes with emotion  
Reacts to physiological response of the wearer to reflect MOOD

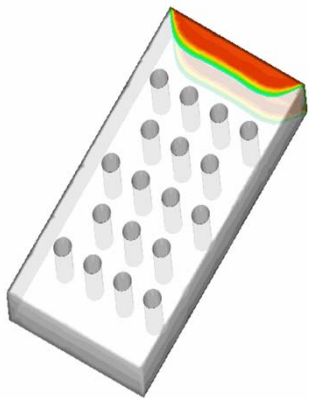
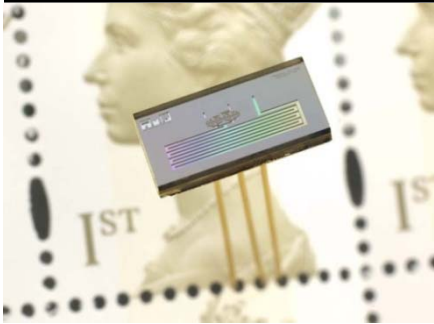
# Sci-Fi Inspiration: “Scent Bubble”

[ reality-in-a-can ]



- ‘UBIK’ (Philip K.Dick) mystical substance sprayed to stabilise a nightmare
- **Star Trek** TNG - ‘Encounter At Farpoint’ – ‘Q’ mood enhancing clothes

# eScent<sup>®</sup> Personalised Time/Controlled Targeted *Fragrance Delivery to Reduce Stress + Improve Sleep*



**Emerging Technology**  
*Bio/Nano/MEMS*

**Sweet Orange**



**AromaChology**  
*"The Science of Fragrances"*

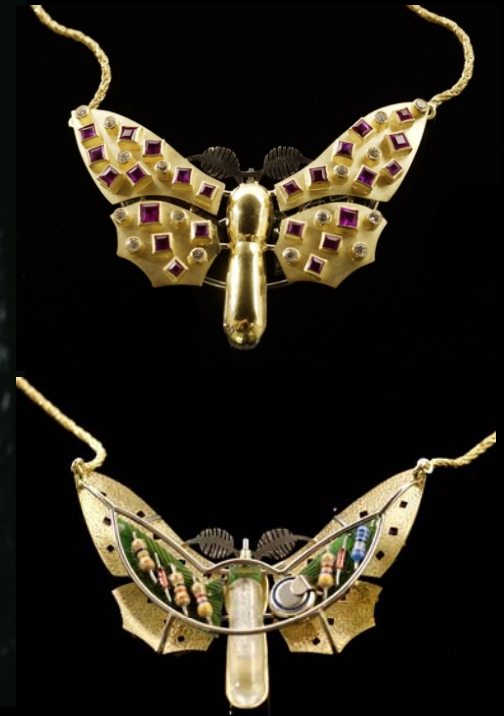


**'Emotional Fashion'**  
*Help Manage Life Stress*

# Scent By A Wireless Web



Photo courtesy of Biologist: Prof Thomas Eisner Cornell University



microfluidics replicate transport mechanism of 'firing chamber' in beetles

# Stimuli + Scent = Response!

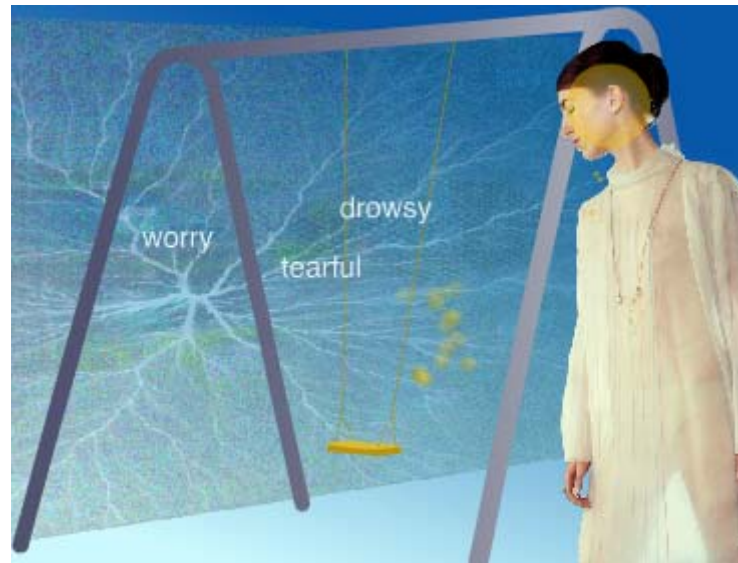
*Sleep + Stress are key triggers for a bipolar episode*

*Scent triggers an emotional response to enhance WELLBEING*

*“Scent Bubble” aura worn as a protective layer to reduce stress, relax + sleep*



Measure response  
Biometric Sensor  
Timer

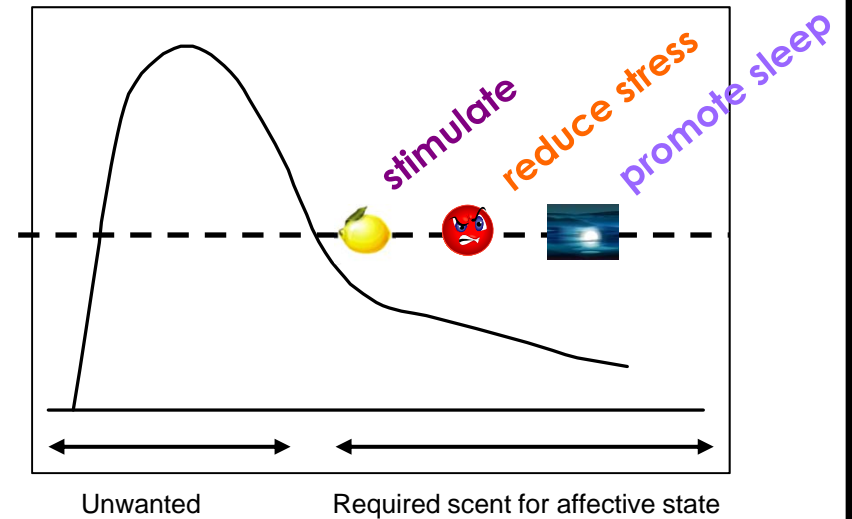


Therapeutic essential oils :  
lavender, citrus etc



Psychological Physiological  
Emotional

# [Emotional] Clothes That Make Scents!



- Targeted, controlled, non invasive
- Less is more
- *Kinder to skin*
- Life enhancing '*scent bubble*'

# Therapeutic Rainbow

Colour Therapy combined with the therapeutic effects of healing essential oils

Wellbeing scents validated by **Professor Tim Jacob**,  
School of Biosciences  
Cardiff University

Colour and scent;  
a unique slant on the  
physiological &  
psychological  
manifestations of  
mood by **Kim Lahiri**

Lavender 1 = relax / sedative / antixolytic

Lavender 2 = anti-nociceptive (pain relief)

Lemon = stimulatory anti-depressant

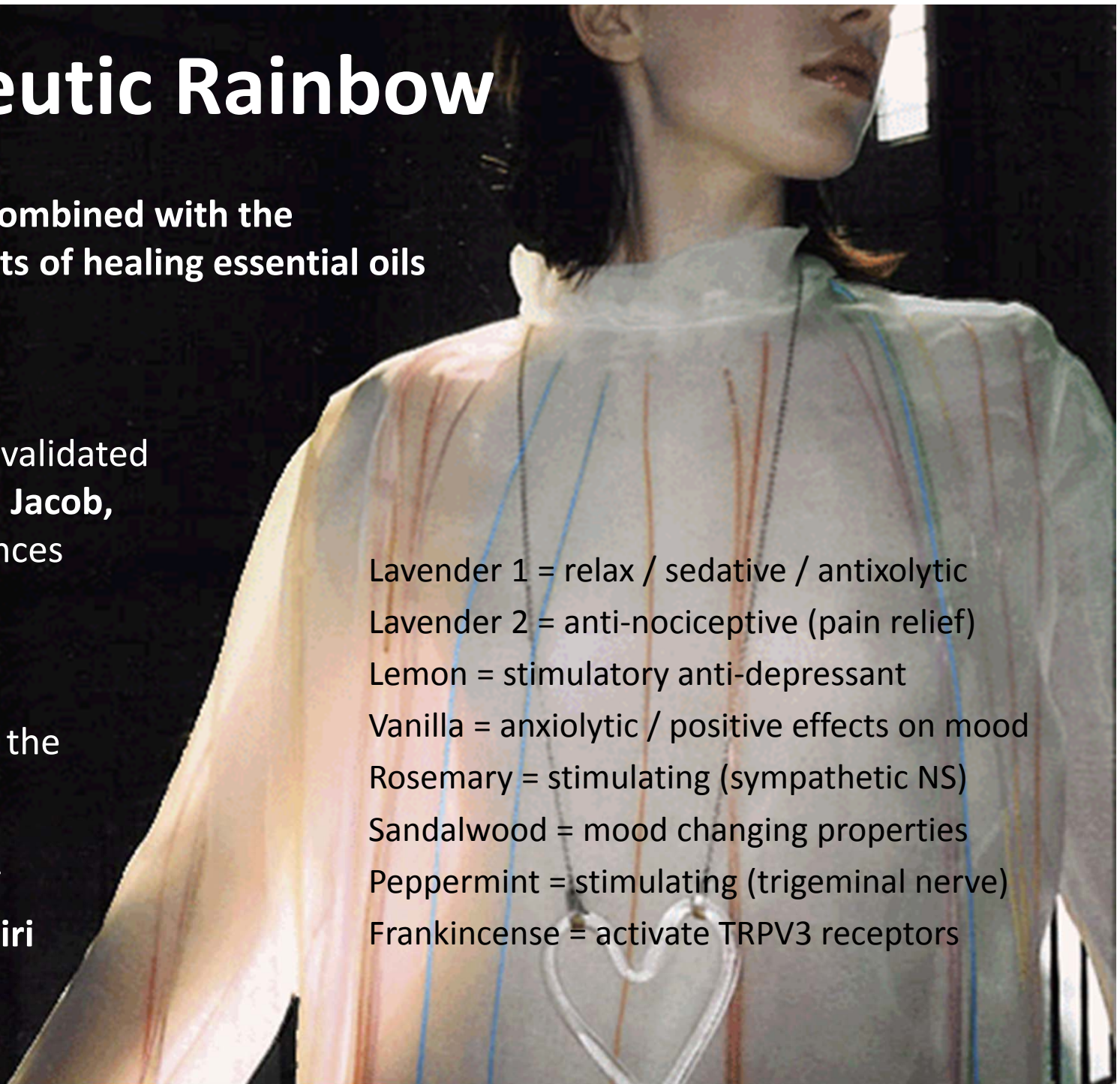
Vanilla = anxiolytic / positive effects on mood

Rosemary = stimulating (sympathetic NS)

Sandalwood = mood changing properties

Peppermint = stimulating (trigeminal nerve)

Frankincense = activate TRPV3 receptors



# Smell The Colour Of The Rainbow

AHRC Knowledge Transfer Fellowship

**PHILIPS**  
sense and simplicity



Create “meaningful” wearable products and ideas  
Explore opportunities resulting from academic work on eScent in areas of  
interest to Philips: Sleep & Stress businesses: AVENT / therapy / mood lighting

**Colour Therapy combined with the therapeutic effects of healing essential oils to create a personal bubble that is responsive to your individual needs**



**Green**  
*Balance*

**Blue**  
*Calm*

**Indigo**  
*Sedating*

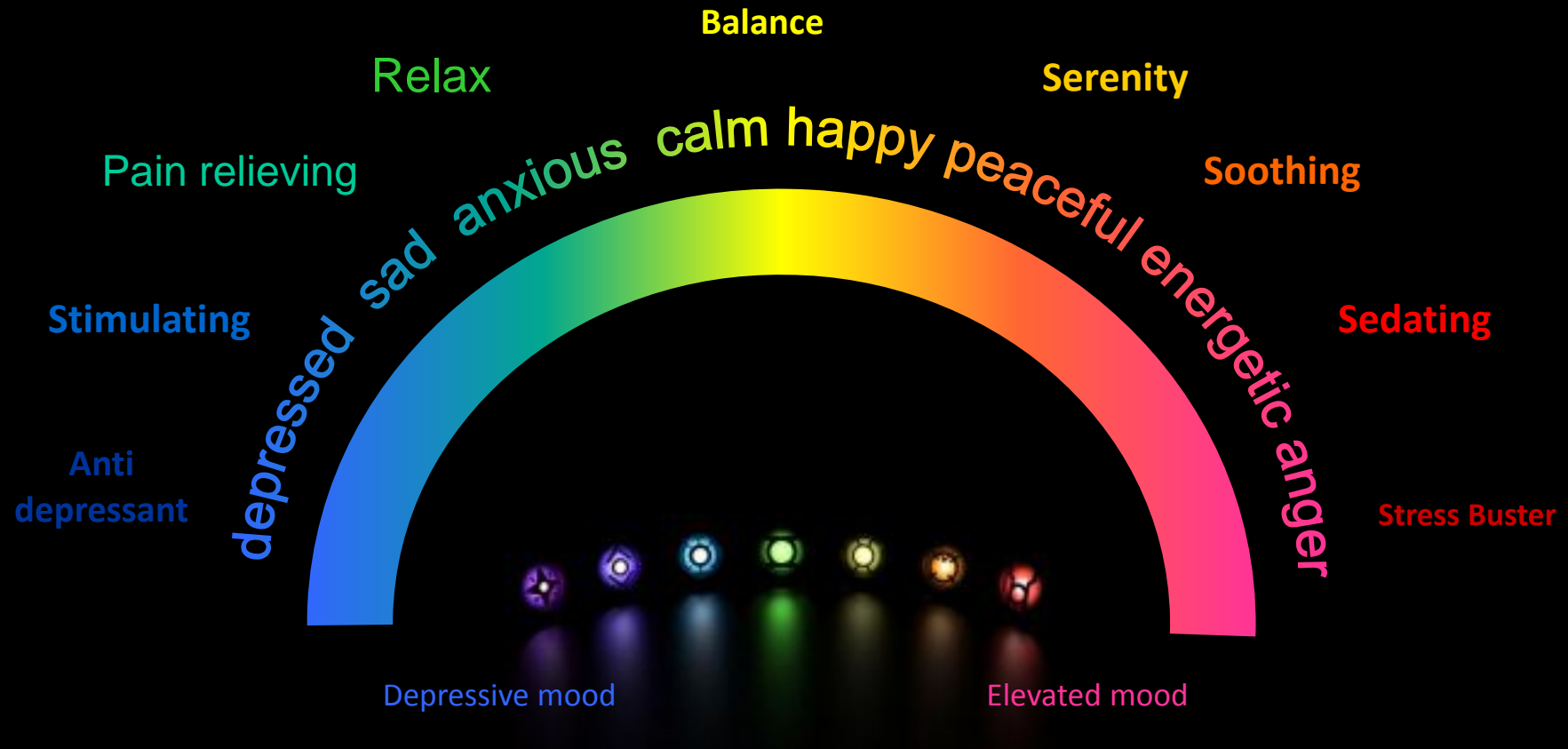
**Violet**  
*Relax*

**Red**  
*Stimulant*

**Orange**  
*Anti-depressant*

**Yellow**  
*Stimulant*

# Therapeutic Rainbow Pendulum

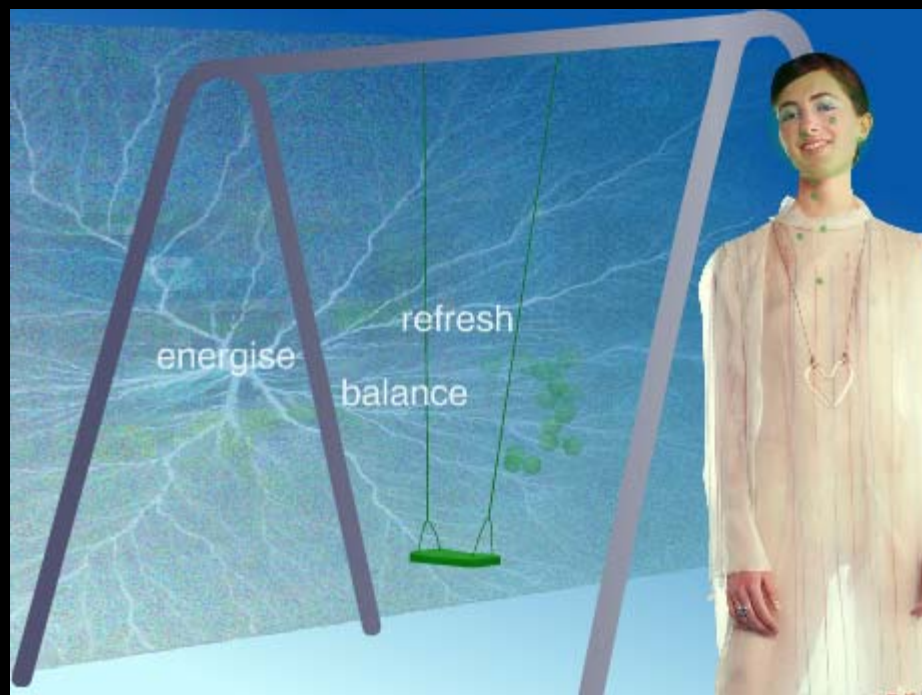


The mood swings from positive to negative and negative to positive until finally a state of balance is achieved

Jenny Tillotson & Kim Lahiri 2011

# Scentrone™

Self track moods levels  
“Scent bubble” on demand

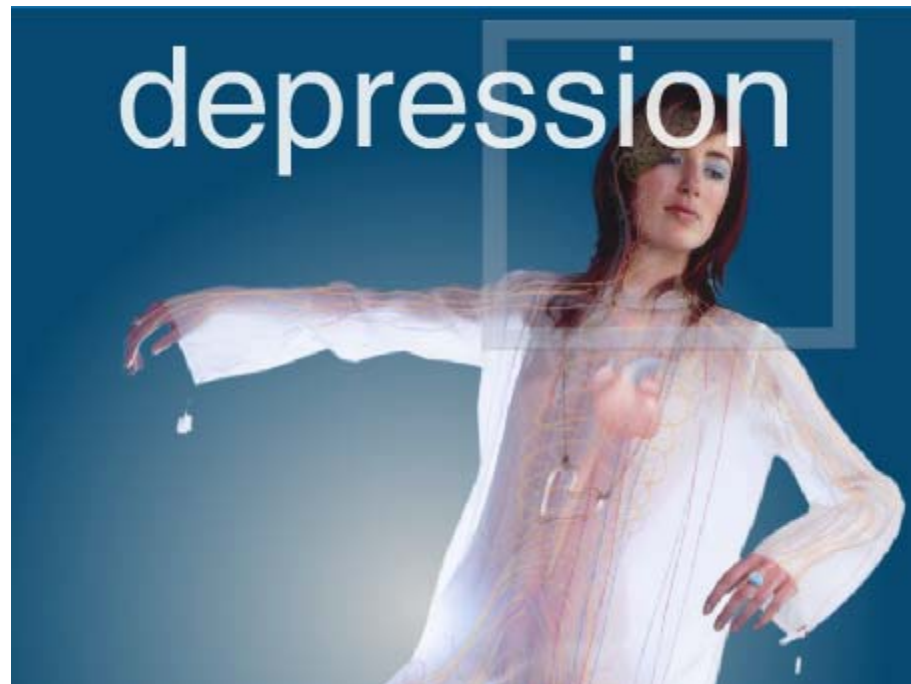


# eScent<sup>®</sup> *Deep Sleep*



# eScent<sup>®</sup> *WRAP (prevent relapse)*

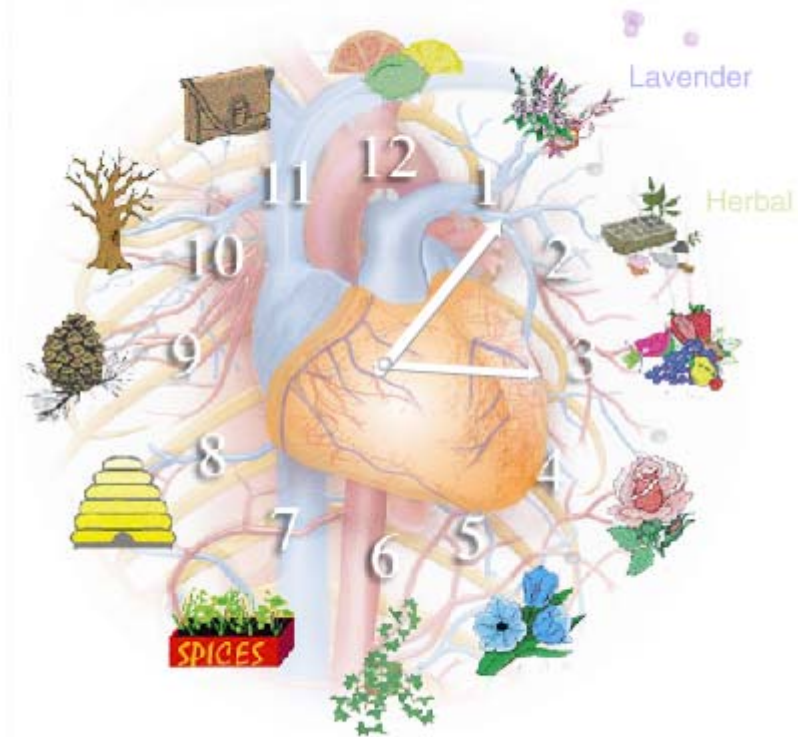
Personalised '*wellness*' qualities in mood-enhancing clothes & jewellery



Complements orthodox treatments (mood stabilisers / anti-depressants)  
Complements ***self-tracking patient driven monitoring tools*** pioneered by  
the QUANTIFIED SELF movement

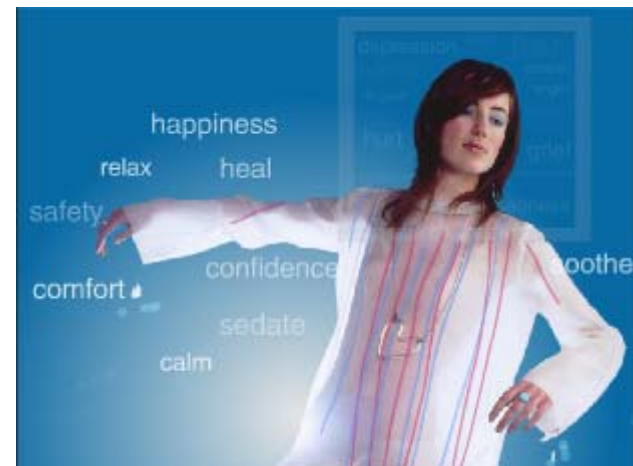
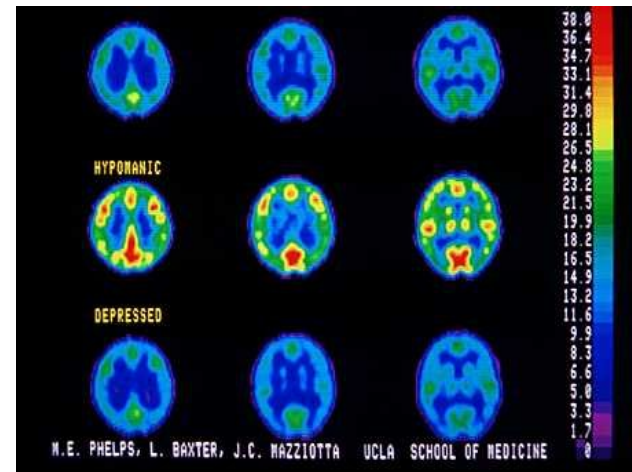
# Scentsory *Personalised* Clock

Tailored to fit the individual  
Delivers a '*Wardrobe of Fragrances*' in a controllable manner -  
depending on mood or time of the day



# mood | boom enhancement

- New form of Communication
  - Olfactory Self Tracking sensors:
    - Hypomania / Mania
    - Depression
- Self Care Relapse Protection
  - prevent bipolar triggers (sleep / stress)
- Digital **WRAP** therapeutic tool
  - *wellness - recovery - action - plan*
  - Complement cybertherapy
  - olfactory CBT - change behaviour?





Thank you!

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