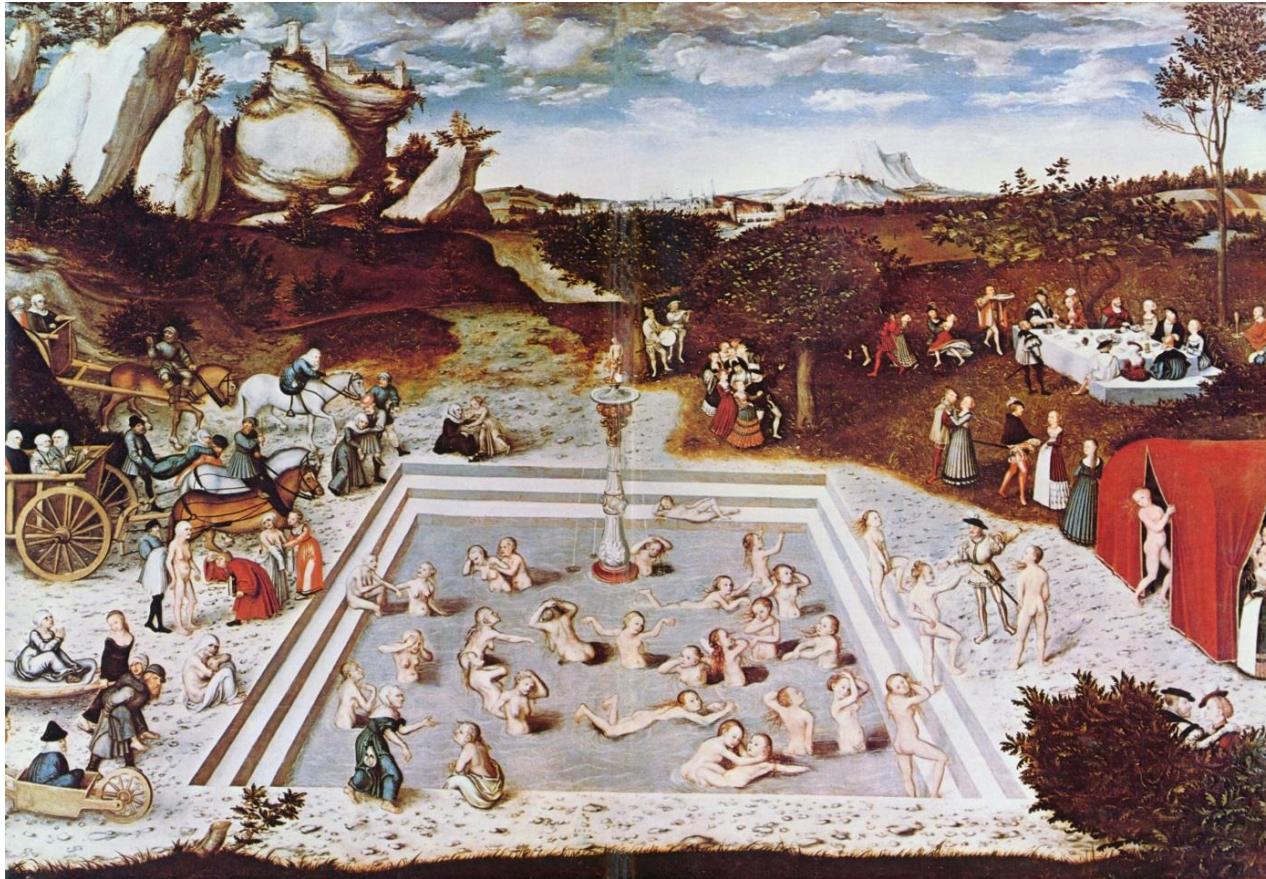

PETER KRISTENSEN
ASSOCIATE PROFESSOR

”Every man desires to live long; but no man would be old.”

Jonathan Swift (1667 - 1745)

AGEING AS AN ARENA



Lucas Cranach the Elder (c. 1472 –1553)



NATIONAL INSTITUTE ON AGING
NATIONAL INSTITUTES OF HEALTH
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
U.S. DEPARTMENT OF STATE

Why Population Aging Matters

A Global Perspective



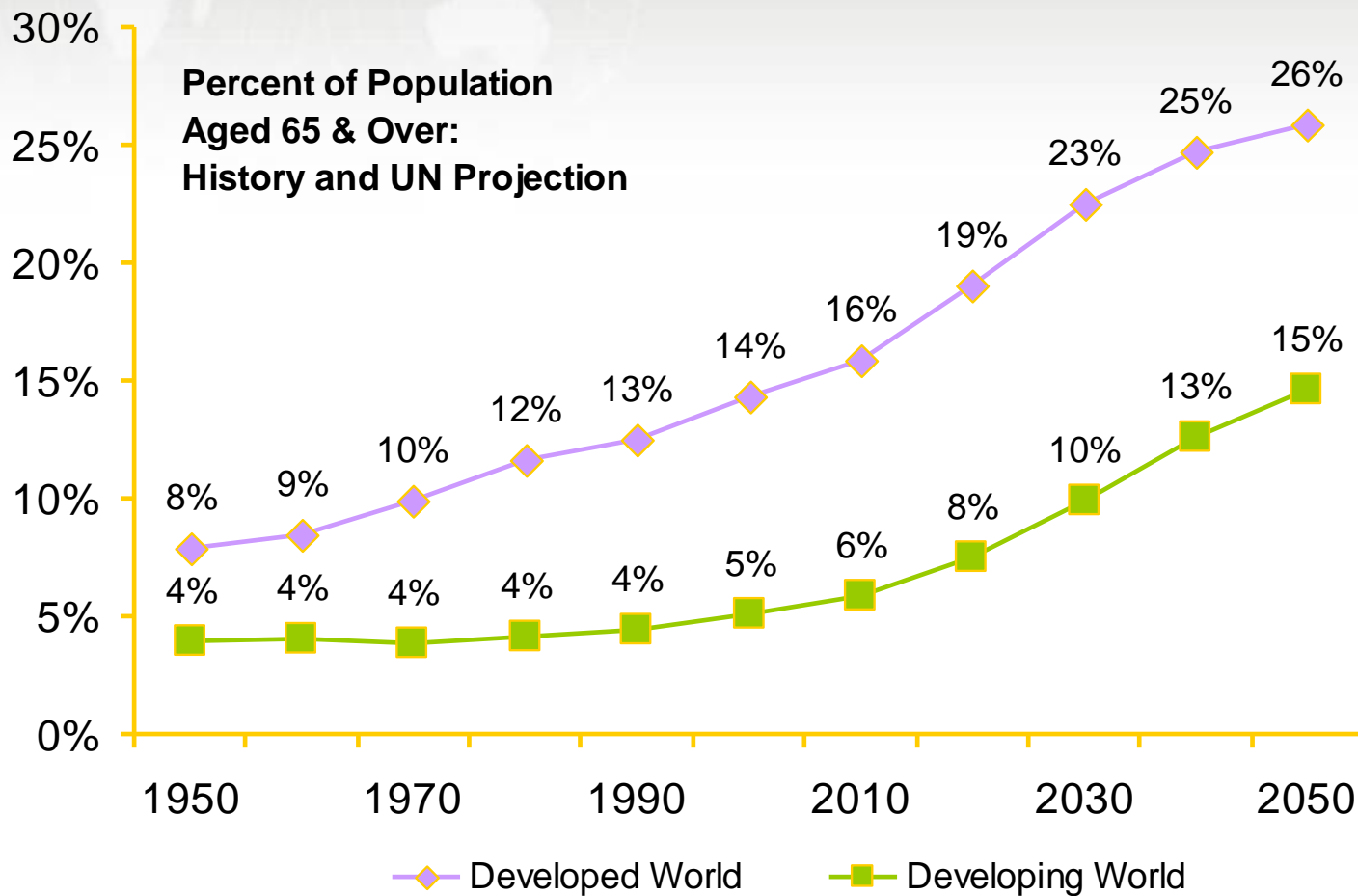
Ageing Headlines!

- **"Life expectancy in most European countries is increasing now by five hours a day"**
- **"Population ageing will fundamentally change the lives of Europeans"**
- **"The scale of change will be comparable to or greater than the effects of climate change or global terrorism"**

Ageing concerns

- **Global leaders see a higher cost for social services, possible labor shortages, and higher costs for pensions, and health care as probable outcomes from a larger older population (AARP, 2004)**

Trends in Global Ageing



Source: UN (2005)

Ageing in the development agenda

“Ageing is a development issue. Healthy older persons are a resource for their families, their communities and the economy.”

WHO Brasilia Declaration on Ageing,
July, 1996



BIOLOGY OF AGING



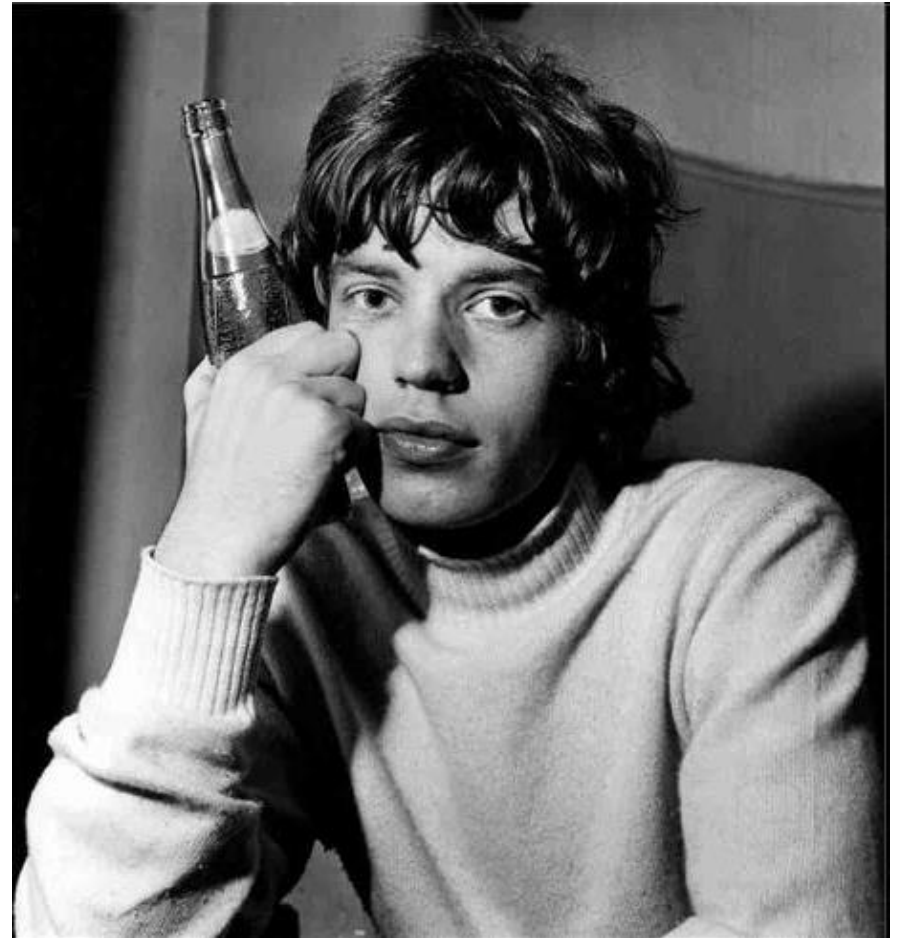
Some age
gracefully...

Goldie Jean Studlendgehawn
born on November 21, 1945





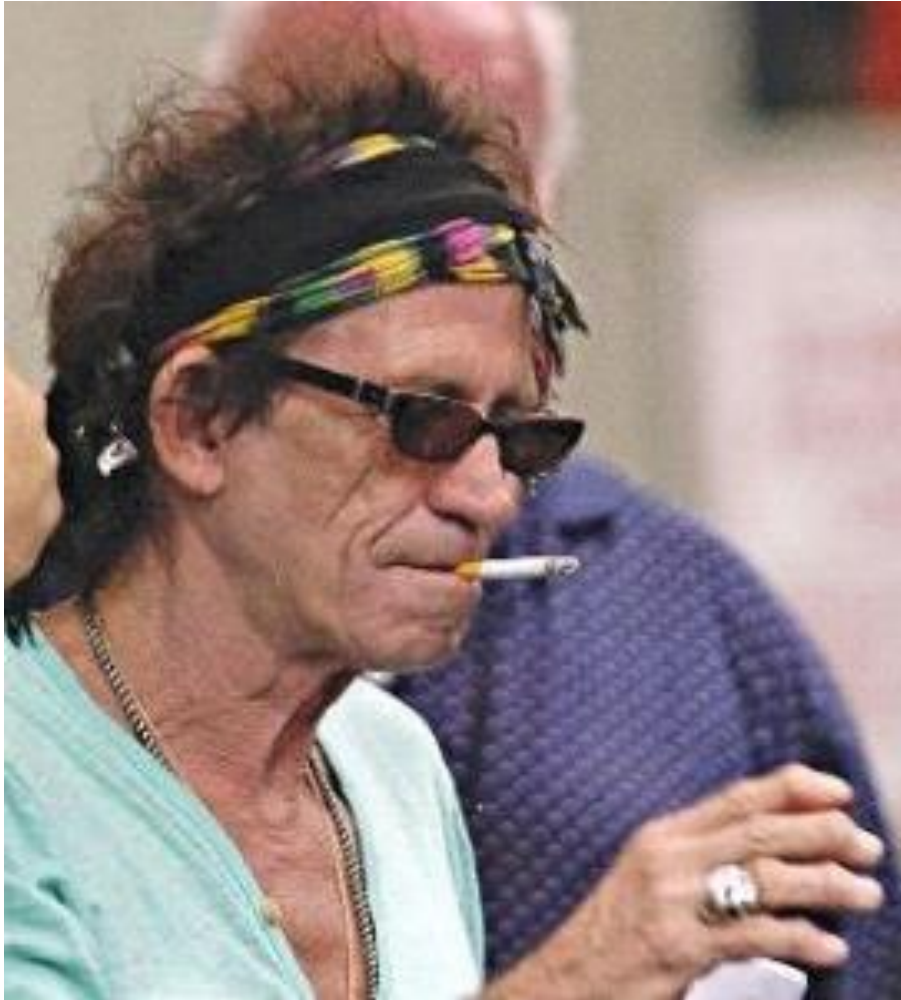
AGEING AS A GLOBAL CHALLENGE
PETER KRISTENSEN



<http://www.morrisonhotelgallery.com/images>

http://www.szepseg.com/uploaded_images

AGEING AS A GLOBAL CHALLENGE
PETER KRISTENSEN



The Sydney Morning Herald

<http://www.smh.com.au>

http://www.szepseg.com/uploaded_images

WHAT IS AGING?

- › The word *senescence* is derived from the Latin word *senex*, meaning "old man" or "old age."
- › The rate of Aging has remained unchanged for thousands of years.
- › Life expectancy is different from aging rate and reflects many other factors



TERMINOLOGY ASSOCIATED WITH AGING:

- › "Aging" = Gradual and spontaneous change, resulting in maturation through childhood and adolescence, and then decline through middle and late age
- › "Senescence" = The process by which the capacity for cell division, growth, and function is lost over time

CONT...

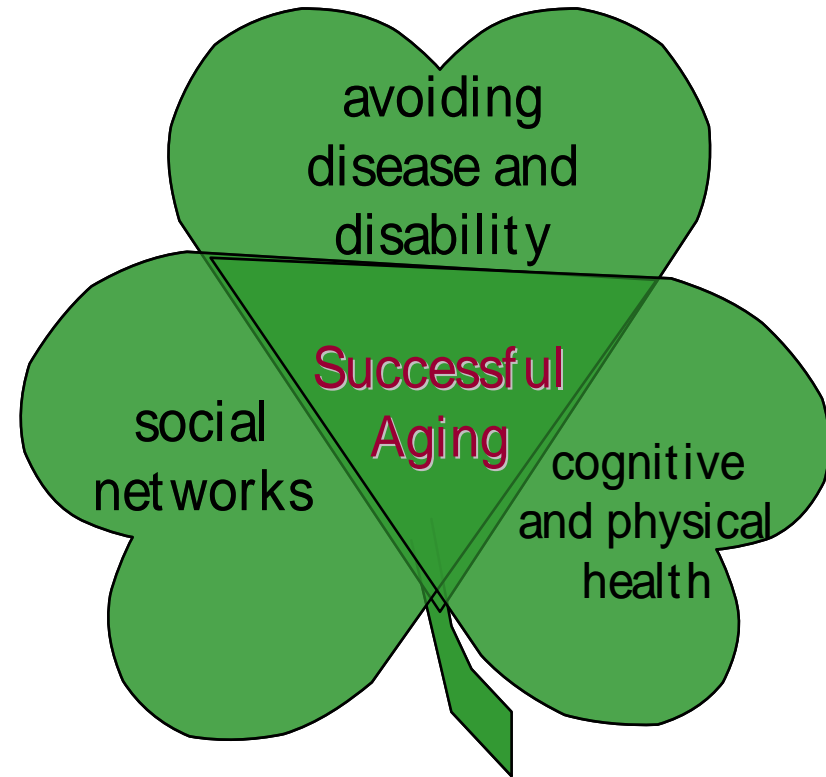
- › **Life expectancy = Lifespan**: the period of time in which the life events of a species typically occur.
- › **Maximum lifespan (t_{max})**: the maximum period of time organisms of a given species can live. Usually refers to the longest-lived individual

PHYSICAL SIGNS OF AGING

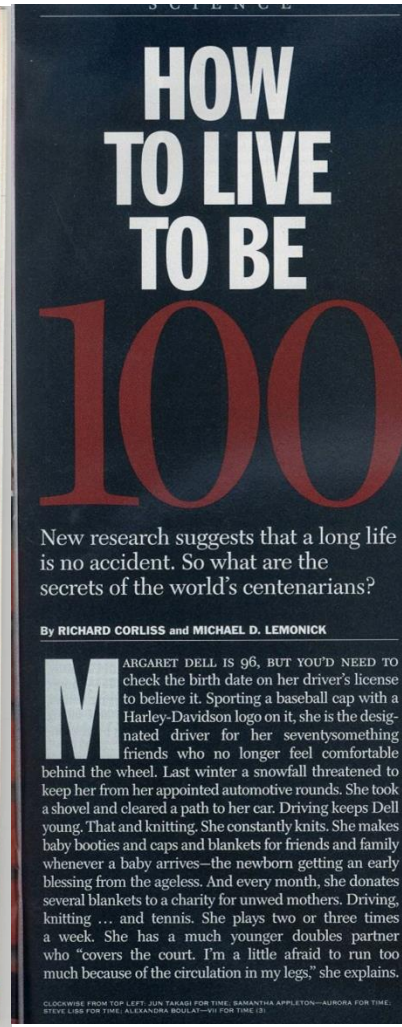
- › Wrinkles on the face and body.
- › Sight, hearing, taste, and smell become less acute.
- › Hair begins to thin and turn gray.
- › Gain weight, particularly around the waist and hips.
- › Loss of bone density over time (especially in women)
- › Slower reflexes and altered gait; development of motor dysfunction
- › Less acute mental agility, and declining memory.
- › Complex diseases associated with aging are caused by the interaction of genetic and environmental factors.

SUCCESSFUL AGING

- › Percent individuals >65 has increased, but proportion residing in nursing homes has decreased (5%)
- › Percent of persons 75-84 with disabilities has decreased (<30%)
- › This suggests an increase in Successful Aging



HOW TO BE A CENTENARIAN...



SUCCESSFUL AGING



one trait that is
common to all
centenarians is
optimism

<http://lenol66.files.wordpress.com>

THEORIES OF AGING:

- › Oxidative Damage
- › Telomeres
- › Genetic Alterations with aging
- › Mitochondrial Aging

Other processes involved:

- › Inflammatory processes
- › Hormonal changes
- › Life style choices

PROTEOMAGE

Functional analysis of evolutionarily conserved
mechanisms of ageing based on advanced
proteome analysis

1 March 2006 – 31 April 2011

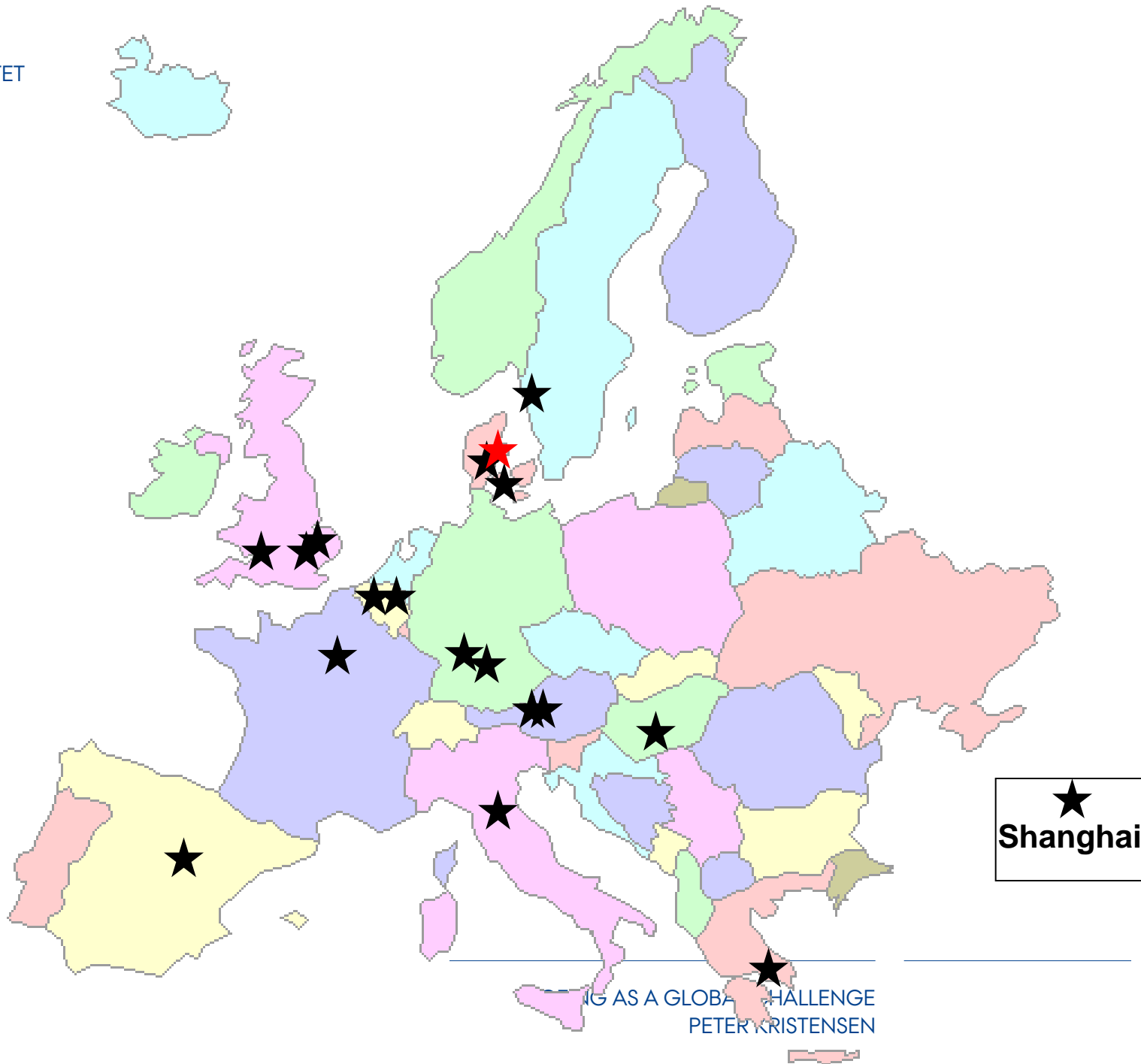
13,9 mill € (EC contribution 10,7 mill €)



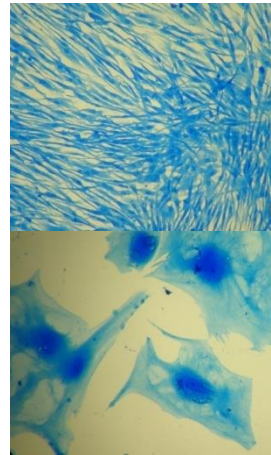
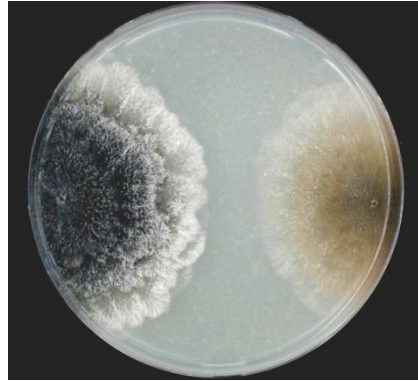
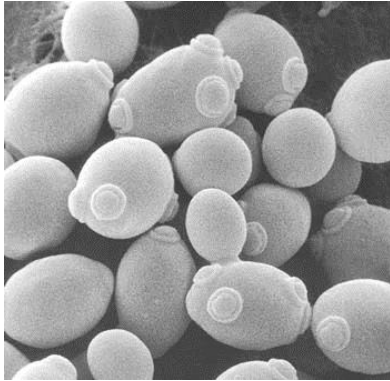
AIM

To investigate changes in protein concentration, protein-protein interactions, and post-translational modifications of proteins during ageing in humans and model systems





Functional analysis of **evolutionarily conserved** mechanisms of ageing based on advanced proteome analysis



OTHER EU-PROJECTS

› GeHA

› MarkAge

CALORIC RESTRICTION

- › 40% reduction in caloric intake
- › Results in healthy, long-lived rats/mice
- › Biomarkers of aging are altered with CR:
 - lower body temperature
 - reduced plasma insulin
- › Gene expression more stable (sign of senescence delay)

WHAT ELSE CAN WE DO TO ENHANCE HEALTHY AGING?

- › Nutritional antioxidants (food, supplements)
- › Anti inflammatory (Minocycline, NSAIDS)
- › Cholesterol lowering (Statins)
- › EAT LESS
- › Exercise

INSTRUMENTAL ACTIVITIES OF DAILY LIVING (IADL)

- › Instrumental activities of daily living are activities related to independent living and include preparing meals, managing money, shopping for groceries or personal items, performing light or heavy housework, and using a telephone.

- › Some basic features are integrated audio and video, light control, heating and cooling, security, and many more.
- › Sometimes called automated homes because they help the home owner automate tasks.



PROBLEMS WITH SMART HOMES

- › Difficult for common user to use
- › Repairing the system
- › Complex
- › Wiring when house is already built
- › False alarm/signals
- › expensive



KEY TERMS

- › Strategies for promoting independence and quality of life for people as they age include ***Assistive Technology***
- › Adaptive Equipment
- › Assistive Devices
- › Environmental Modifications
- › Environmental Interventions

IMPORTANCE OF AT

- › Increase Independence
- › Increase Self-Esteem
- › Decrease Burden of Care

INDEPENDENCE

- › An important concept for what we hope to accomplish in our use of technology and environmental interventions:

the ability to complete basic daily tasks without personal assistance

BASIC DAILY TASKS

- › Activities of Daily Living (ADLs)
 - › eating, grooming, dressing, toileting, bathing, transferring, and walking
 - › language and memory
- › Instrumental Activities of Daily Living (IADLs)
 - › shopping, cooking, housekeeping, getting to places outside of home, using telephone, money management

EATING & DRINKING

Rocker knives

Roller knives

Universal cuffs

Plate guards

Non-skid dishes

Cups with lids

Nosey cups



DRESSING

Long-handled shoe horn / Sock aid

Dressing stick

Reacher

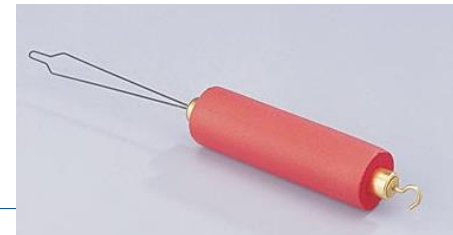
Buttonhook/zipper pulls

Elastic laces

Pull-on clothes, Velcro closures, button
extenders

Clip-on earrings, magnetic clasp

jewelry



BATHING

Grab bars

Bath bench

Hand-held
shower head

Long-handled
sponge/foot
brush

Soap dispenser



TRANSFERRING & MOBILITY

Canes

Walkers & accessories

Wheelchairs &
accessories

Scooters

Ramps & Lifts



LANGUAGE & MEMORY

Calendar

Notebook

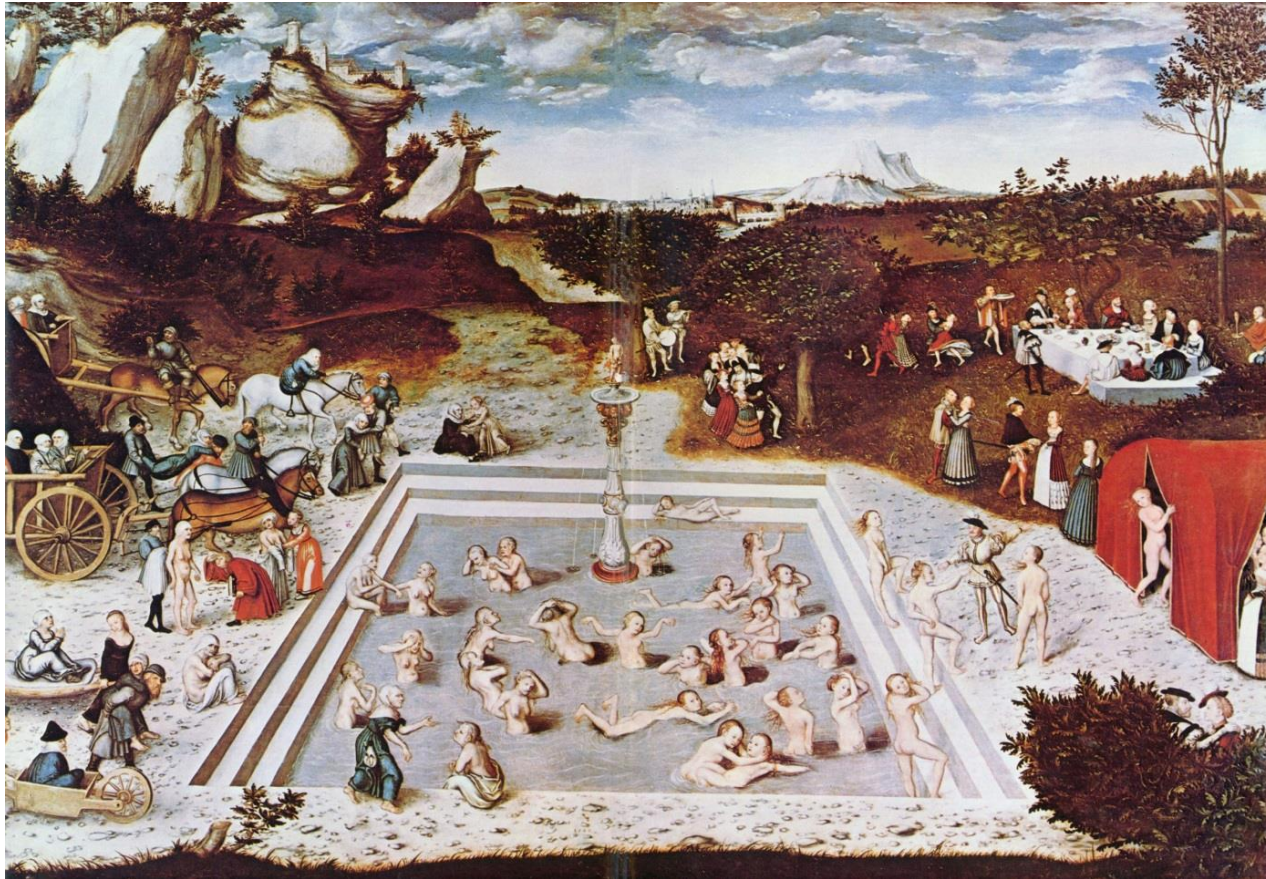
Journal

Electronic Paging
Systems

Smart
Environments



AGEING AS AN ARENA



Lucas Cranach the Elder (c. 1472 –1553)

CHOOSING YOUR ARENA

- › Look into you team competencies and interests
 - › Are you approaching the challenge from the gerontology or geriatrics site (invention/prevention)
 - › Consider all aspects (technological, societal, psychological, economical etc.
-
- › Good luck