Research For a Better Age

Welcome
The best place to start is the beginning

• In the beginning

• Life was very bad for most people most of the time

• Life was very short for most people most of the time

• Life expectancy is a good measure of whether things are getting better or not
Why are we here?

Life expectancy has increased steadily over the last century.
These trends are projected to continue

In 2050 about two billion people will be over the age of 65 (out of an estimated world population of about 9 billion)
However, maximum lifespan has not increased at all

Isocrates (4th-5th Century BC)
Died aged 98

“Buster” Martin
Born 1906 and still going
Being old is not a problem for Buster..but

- Growing older is associated with an increased chance of death (mortality)

- Growing older is associated with increased periods of time spent ill before death or recovery (morbidity)

- Morbidity is a miserable and expensive condition to find yourself in.

- Current morbidity costs are about £15-45 billion (total Government managed expenditure is ~£590 billion)
These figures mask the diversity of the ageing population
Different styles of old age

Bored & depressed (9%)
- Poor
- Sick
- Miserable
- Watch lots of TV

Satisfied Innovators (17%)
- Rich
- Healthy
- Happy
- Often on TV
Healthspan is the key to independence
Is healthspan a cause for concern?

**Figure 2**
Life Expectancy and Healthy Life Expectancy

- Female life expectancy
- Male life expectancy
- Female healthy life expectancy
- Male healthy life expectancy

UK House of Lords S&T Committee Report
Confounding variables

• Data from the US *does* show a compression of morbidity
• Most survey data monitors self reported health
• *People* compare themselves to their peers
• *People* use different definitions of sickness
• *People* are a PROBLEM
Can studying the fundamental biology of ageing help?

- Can it help us understand how ageing happens?
- Can it help us understand what might happen to a population if ageing is slowed?
- Can it offer effective interventions into human ageing?
To find out UK Government spent about £10 million over six years in two research programmes*

*for comparison a new medicine costs about £600 million to develop and the total UK annual budget for all research on everything is about £700 million
Was it worthwhile?
YES!

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Animals have common ageing mechanisms

Genotype Median lifespan
+ 16 days
daf-2 35 days
Klass 1983
Kenyon 1993
Kimura, Ruvkun 1998

Genotype Median lifespan
+/+ 44 days
chico/+ 60 days
chico/chico 65 days
Partridge, Gems, Tatar 2001

Genotype Median lifespan
+/+ 18.7 months
Igf1r+/− 24.9 months
Holzenburger 2003
Blüher, Kahn 2003
Withers, 2007
Altering the rate of ageing:

- Decreases the rate at which pathologies appear and reduces their severity once they do appear
- Produces increased healthspan
- If this happens in humans we may well spend less money on care, promote independence and get happier older people
Ageing hasn’t been ‘cured’ yet

• One of our jobs today is to put you on your guard against people who say it has...

• Some people say it by accident

• Some people say it out of misplaced enthusiasm

• Some people say it to make money
Some people...

Alex Chui
Inventor of the Immortality Device,
on sale at www.alexchiu.com

“If you are not satisfied with the results brought by the Immortality Devices we can refund your money back within 90 days.”
Design: The second string to our bow

• In the stone age I would have been classed as disabled.

• Now (thanks to Spec Savers) I’m not.

• Designers promote independence by designing away disability.
SPARC

• We bring the best designers and the best biologists together

• We have them work on separate problems but in a supportive network

• Links sometimes exist which you could never have imagined
Today

• Better homes for older people
• Better immune systems for old people
• A new shower and a neutrophil don’t seem to have much in common
• BUT...
Human ageing as a bio-social whole

- Poor adaptations to your home are a source of immediate and ongoing psychological stress.

- Psychological stress is associated with suppression of the immune system in older people.

- Do good interior designers keep you healthy?

- Watch on...