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What is ageing? Can we delay it?

A new report by the Longevity Science Panel concludes that the biological process of ageing is complex and an anti-ageing 'wonder' pill is not in sight.

The UK population's life expectancy could be more effectively improved through seemingly simpler measures such as exercise, good nutrition and better use of existing treatments, rather than waiting for a dramatic anti-ageing breakthrough.

Research brought together by the Longevity Science Panel, (previously the Longevity Science Advisory Panel) in it's third report entitled, "***What is ageing? Can we delay it?***" focuses on the biology of ageing and looks in particular at:

- What the key advances have been in scientific understanding about this complex topic;
- What the potential might be for new developments such as drug treatments and other interventions to increase lifespan, and
- When we might expect to see any substantial changes in lifespan from these new developments.

The Panel commissioned a survey, which involved individual interviews with eight of the most well-respected biogerontologists. The paper compiles their views on their current knowledge on the biology of ageing, treatments which show promise in delaying the ageing process and future outcomes from scientific research on this topic. The views are also supplemented with findings from published studies on the effectiveness of the most promising anti-ageing treatments. In addition, estimates of what anti-ageing interventions might mean for the extension of human lifespan in the future have been modelled for illustration.

Key findings include:

- Ageing is a complex biological process, and understanding it requires a variety of scientific approaches. There is a lack of consensus by the experts on which mechanisms of ageing are dominant in humans, which presents challenges to the development of anti-ageing intervention.
- Many potential anti-ageing interventions have been explored but their effectiveness on humans is unclear and their side effects are potentially unacceptable.
- It is unlikely that a single anti-ageing drug would be available in the near future.
- Preventive strategies including behavioural change are likely to be more effective, but compliance with lifestyle changes and drug treatment is usually poor in the medium- to long-term.
- To substantially increase life expectancy, at birth for example from the current average life expectancy in the UK of around 80 for males to age 125, the Longevity Science Panel model suggests that an intervention is needed that could slow the ageing rate by more than 50%, which is administered consistently from age 25. No such treatment is currently in development or likely to appear in the next 10 years.
- Longevity will continue to increase in the next 10 years but the rate is likely to slow down.

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Summary of the Expert Views:
The experts had mixed opinions on which, if any, of these interventions were most likely to delay human ageing. Although many potential anti-ageing interventions have been explored, they either have problems such as unacceptable side effects or lack strong evidence they will be effective for humans.

Ageing is viewed as a highly complex process, so there was little agreement among the experts about which biological pathways were the most important in contributing to human ageing. The experts also disagreed on how far ageing can be considered simply as the accumulation of multiple diseases, as typically seen within the elderly, or as a distinct process in its own right.

The experts agreed that preventing the major causes of death within the elderly will almost inevitably extend human lifespan.

The anti-ageing interventions highlighted included:

- drugs already licensed for other purposes such as rapamycin and statins;
- drugs available as nutritional supplements, such as resveratrol and DHEA;
- drugs in development that act on one or more of the pathways associated with ageing;
- behavioural interventions, in particular physical activity and dietary restriction; and
- regenerative medicine, including stem cell therapy, gene therapy and epigenetics.

Overall, there was consensus among the experts that increases in life expectancy will continue over the next ten years, but that the rate of increase will slow.

Dame Karen Dunnell, Chair of the Longevity Science Panel commenting on the report, said: "From this research we have been able to build up a picture of the latest developments in this area. The experts tended to agree on which possible factors are important in understanding the biology of ageing. However, they did not necessarily agree on which are the most important components of the ageing process, or on which interventions might have the greatest potential for extending lifespan.

Our goal for this project was to produce a report about the complex processes involved in ageing. We wanted it to be accessible to a wide spectrum of readers, not just those involved in academic study."

A copy of the report, '**What is Ageing? Can we delay it?**' is available to download at www.longevitypanel.co.uk/biology-ageing or by requesting a copy from longevity@landg.com.

Journalists wanting further information or to arrange an interview with Dame Karen Dunnell, Chair of the Longevity Science Panel or another member of the Panel should contact:
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Notes to editors
What is Ageing? Can we delay it? is based on the opinions expressed by the authors and is available for general information only.

The Longevity Science Panel was set up by Legal & General to explore the impact that a range of factors may have on future life expectancy in the UK. This includes the drivers that are enhancing life expectancy, for example, medical advances and social change, as well as the inhibitors, such as aspects of lifestyle and delays in the development of treatments. The Panel is chaired by Dame Karen Dunnell and also consist of Sir John Pattison, Sir Colin Blakemore, Professor Klim McPherson and Professor Steve Haberman.