



How do we live well in old age?
January 29, 2016

How do we live well in old age?

Anchorwave | www.anchorwave.com
britishgut.org

The world's oldest man, Yasutaro Koide died last week at the age of 112. Commentators quickly focused on his reported 'secret to longevity' – not smoking, drinking or overdoing it. Sounds sensible, but speculation on the basis of one individual is not necessarily the most helpful way of addressing this human quest for the Philosopher's stone. The very old do spark our interest – but is the search for a secret to longevity actually misguided? Wouldn't you rather live healthier than longer in poor health? Surely, what we really want to know is how do we live well in old age?

Clearly as scientists we try to illuminate these questions using populations of individuals. Many previous explorations have approached this question by comparing populations of young and old people, to look for differences. It's not difficult to see that this approach may be confounded by the many developments that happened between generations. Also time itself should

not be the focus – at least in part because time is one thing we are unlikely to be able to stop!

The real question behind our interest in old survivors is how some people at old age are robust and fit, while others debilitated and dependent. To this end, recent scientific interest has turned to investigating the predictors of frailty within populations of roughly the same age. Frailty is a measure of how physically and mentally healthy an individual is.

One finding which has emerged is that frailer older adults appear to have an increased levels of low grade inflammation – so called ‘inflammaging’ (Franceschi, Bonafe et al. 2000). Recent evidence indicates that our immune and inflammatory system are educated in our gut, through interactions with the gut bacteria (Mazmanian, Liu et al. 2005; Cani, Possemiers et al. 2009; Olszak, An et al. 2012). So could gut bacteria be part of the process of inflammation driving frailty?

New research (Jackson, Matthew et al. 2016), published on 29th January by researchers at the Department of Twin Research and Genetic Epidemiology at King’s College London, has found that how frail an individual is associates with the diversity bacteria inhabiting their gut, and identified key anti-inflammatory bacteria associated with robust ageing.

The group looked at the bacteria that were found in stool samples from over 700 healthy British twins, investigating the association between the twins’ gut bacteria and how frail they were. The strongest association was between frailty and the diversity of the gut bacteria with the less frail individuals having the most diverse gut bacteria. They found that a group of bacteria belonging to the species *Faecalibacterium prausnitzii* were found in higher amounts in the less frail, or healthier, twins. This is a particularly interesting bacterium as it has been found to associate with good health in other diseases like inflammatory bowel disease and is believed to reduce inflammation of the gut.

There were other bacterial species that were observed in increased amounts within the frailer twins in the study. One of these was *Eubacterium dolichum*. *E.dolichum* has previously been studied as it was found to increase in individuals who had a ‘Western’ or less healthy diet. It may be the case that poor diet or dietary changes within frail individuals

can cause changes to the gut bacteria. This is of particular interest as dietary changes might be an easy way to encourage healthy ageing.

The group found that these specific bacterial changes were also found when comparing frailer, more elderly, individuals from Irish care homes who had previously been used to study the effect of ageing on the gut bacteria as part of the ELDERMET study, from the University of Cork (Claesson, Jeffery et al. 2012).

This study does not determine if the changes to the gut bacteria are a cause of poor health in ageing or are just a result of frailty. However, these results provide new avenues for research, with the potential to promote health in old age through targeting of the bacteria within our guts.

Claire Steves (Senior Lecturer) and Matthew Jackson (PhD Student)
Department of Twin Research and Genetic Epidemiology
King's College London

© 2016 British Gut Project. All Rights Reserved.