News release

The epigenetic clock is ticking: NIHS researchers help unravel the science behind healthy ageing and exceptional longevity.

Lausanne, Switzerland – February 11th, 2016. Why do some people live longer, healthier lives than others? Is longevity in our genes? These are some of the questions addressed in a series of papers co-authored by researchers from the Nestlé Institute of Health Sciences and the University of Bologna.

Most research into ageing looks at the factors which cause us to age faster. The current series of papers instead focus on those that allow some of us to live in relatively good physical and mental health for 20 or 30 years longer than the average.

The most recent of these papers builds on research first carried out by NIHS and the University of Bologna in 2013 to discover new metabolic clues to living longer and healthier lives. Published in AGING, a scientific journal with the highest impact factor in the field, this latest research looks at the “epigenetic clock” (an epigenetic biomarker of ageing) of 82 Italian “semi-supercentenarians” (aged 105+), along with 63 of their offspring (average age: 71.8 years) and 47 age-matched controls (average age: 69.8 years). The researchers analysed and compared the DNA methylation levels of the peripheral blood mononuclear cells (PBMC) of the above-mentioned groups in an attempt to identify an epigenetic signature of healthy ageing and test whether families where exceptional longevity is present do have a peculiar epigenetic signature.

Not only did the study discover that the 105+ group has a lower intrinsic epigenetic ageing rate in PBMCs and thus a slower rate of biological ageing than the general population, appearing to be younger by an average of 8.6 years than expected based on their chronological (i.e. actual) age; their offspring also have an epigenetic age 5.1 years younger than their age-matched control group.

“Identifying epigenetic signatures of longevity is an important first step in understanding exactly how these individuals manage to avoid or postpone the major age-related diseases”, explains Sebastiano Collino, who led the NIHS team. “Further research is now needed to fully investigate these processes and, it is hoped, to use these findings to extend the benefits of successful ageing to the general population.”

Collaborative research into the metabolism and genetics of centenarians and semi-supercentenarians and their offspring is currently ongoing at NIHs and the University of Bologna. These results, which both parties are planning to publish later in 2016, aim to reveal for the first time protective factors for the most important chronic age-related diseases.

Researchers from NIHS and the University of Bologna have previously published the results of a range of collaborative studies into healthy ageing. The findings shed light on the role of three genomes (nuclear, mitochondrial and microbiome) in the ageing process, investigate the molecular footprints of longevity, and describe systems medicine in inflamaging, a term created by Professor Claudio Franceschi of the University of Bologna to indicate a complex phenotype involved in a large number of pathologies such as age-related diseases and cancer which all share a common inflammatory pathogenesis.

NIHS’s expertise in furthering our understanding of ageing to build a scientific foundation on how nutrition, environmental factors and metabolism help sustain healthy ageing into late life has also been recognised in the form of a prestigious EU Joint Programme for Neurodegenerative Disease “Horizon 2020” grant (ADAGE project). This initiative aims to form a new international research consortium involving scientists from Italy, the UK and Sweden to better understand Alzheimer’s dementia (AD)
pathogenesis, and establish why some people maintain brain health into late age, while others succumb to neurodegenerative diseases such as AD.

Over the next few years, NIHS and the University of Bologna will continue to collaborate and share their knowledge across the two centers to uncover the science beyond longevity and healthy ageing.

Nestlé’s ultimate goal is to provide nutrition solutions that help prevent or manage chronic diseases, to promote healthy ageing and optimal quality of life.

**About NIHS**

NIHS is a biomedical research institute, part of Nestlé’s global R&D network, dedicated to fundamental research aimed at understanding health and disease and developing science-based targeted nutritional solutions for the maintenance of health. To achieve its aim, NIHS employs state-of-the-art technologies and biological models to characterise health and disease with a holistic and integrated approach. The ultimate goal of the Institute is to develop knowledge that can empower people to better maintain their health through nutritional approaches, especially in relation to their molecular profile and lifestyle status.

**References**


