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News

Life Beyond Midlife: How Far Anti-Aging Techniques Could Go?

You may have observed that life after midlife is on chance. And if, in case one remains will not be able to live the way before; there would be health issues, memory loss and other diseases. Our body behaves like computer in many ways, as computer works according to the programs alike our body functions on the basis of some molecular programs. But what happened when these programs don't work properly?

Claes Wahlestedt, M.D., Ph.D., professor of psychiatry and behavioral sciences and associate dean for therapeutic innovation at the University of Miami, Miller School of Medicine, is senior author of a new study -- *Longevity Related Molecular Pathways Are Subject to Midlife 'Switch' in Humans* -- published today in*Aging Cell*.

During his work with the first author, Jamie Timmons, Ph.D., of King's College London and Stirling University Science Park, United Kingdom, and an international group of researchers on human aging, Dr. Wahlestedt made an astounding observation i.e.; *Key molecular programs known to promote longevity do not last beyond midlife.*

This study opens a new door of thought and probably a satisfactory answer to the question that why health-protective programs stop working after the 60's and the human body burdens with diseases. A question emerge from this that if one desire to uplift the mechanism with "anti-aging" drugs, nutrients or changed lifestyles, would oneself be able to control these at its 60's? *"Possibly", while answering to this question Dr. Wahlestedt said – "at least if you hope to benefit fully from such interventions".*

"For over a decade, it has been clear that key biochemical events regulate the longevity of small short-lived animals such as worms, flies, and mice, but these mechanisms had not been observed to be active in humans," Dr. Wahlestedt said. "In this international clinical and genomic study, we report for the first time that humans use these same biochemical pathways during aging. Surprisingly, however, humans appear to stop using these pathways from about 50 years of age onward. Therefore, how long and how 'hard' each person regulates these pathways may influence human lifespan".

Dr. Wahlestedt said "The new study was the result of two decades of persistent efforts initiated while I and Dr. Timmons worked at the Karolinska Institute in Stockholm, Sweden". They adapted a new procedure to thoroughly measure the gene expression patterns by applying them to selected divisions of tissue samples collected from humans of different ages.

Primarily, focusing on brain and muscles, the noticed observations in humans go straight with earlier observations in short-lived species. This involves proponent role of a protein complex named mTOR; mechanism to regulate the protective cell program and in the production of mitochondrial reactive oxygen species. These cellular mechanisms consist of two-third of the molecular aging in humans.

"Our study revealed that the complexity of regulation of aging programs may be much greater in humans as compared to other species," Dr. Wahlestedt said. "This is related to our more complex genome, which may have evolved to allow for longer and healthier lifespan. But perhaps humans were not really meant to last beyond their 50s."

Form the insight of a molecular aging research, human is distinctive from other species. Howbeit, researchers examined that while aging, molecular responses don't share the linear pattern.

"Beyond the need to consider different 'phases' of molecular aging, clinical variables such as aerobic capacity and insulin resistance are also important to quantify," Dr. Timmons said. "They interact with some of the same genes as

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aging, are partly inherited, and are important predictors of health. We were able to look at these for the first time when modeling human aging."

Well, for the first time, protein regulators of longevity and health span have been found in humans after short lived animals. This also indicated factors involved in aging i.e.; non-protein-coding genes.

"We've demonstrated that the most valid of 'anti-aging' programs are naturally active in humans and for some reason stop when we reach our 50s," Dr. Wahlestedt said. "This not only provides a specific time window to now study human aging, it also indicates that these established anti-aging strategies may no longer be effective (if too active there can be side effects) and so new approaches will be needed in long-lived humans."

It has been observed that these aging programs are already installed in our body and work in accordance with time. No anti-aging technique is much efficient to make the programs work when they gradually stop working.

Keywords:
Anti-aging, midlife, longevity, molecular programs, mTOR, aerobic capacity, insulin resistance

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