Genes of Healthy Older Adults Revealed Presence of Protection from Cognitive Decline

An 8-year accrual and analysis of the whole genome sequences of healthy older adults, or “Wellderly,” has revealed a higher-than-normal presence of genetic variants offering protection from cognitive decline, according to a study in *Cell*.

Researchers sequenced the whole genomes of 600 participants and compared their DNA with genetic data gathered from 1,507 adults by Inova Translational Medicine Institute (ITMI) as part of a separate study (who represented the general population). All of the genomes were mapped using the Complete Genomics sequencing platform.

After filtering to control for ethnic differences and blood relatedness, downstream DNA analyses were conducted on the genomes of 511 Wellderly and 686 ITMI individuals. Researchers analyzed 24,205,551 individual gene variants in both groups.

The Wellderly group had a significantly lower genetic risk for Alzheimer’s and coronary artery disease. However, no difference was found between the two groups in genetic risk for cancer, stroke, or type 2 diabetes, suggesting protective behaviors or other genetic characteristics might be at play among the Wellderly.

Of particular interest was a group of ultra-rare coding variants found among 10 Wellderly individuals in the COL25A1 gene, which encodes for a major component of amyloid plaques found in the brains of patients with Alzheimer’s disease. None of the coding variants were found among the ITMI individuals.


Wayfinding Troubles May be Early Sign of Alzheimer’s Disease

Long before Alzheimer’s disease can be diagnosed clinically, increasing difficulties building cognitive maps of new surroundings
may herald the eventual clinical onset of the disorder, according to a study in the *Journal of Alzheimer’s Disease*.

The study included 42 clinically normal individuals who lacked the cerebrospinal fluid markers for Alzheimer’s disease, 13 clinically normal individuals who were positive for these markers and thus had preclinical Alzheimer’s disease, and 16 individuals with documented behavioral symptoms of early stage Alzheimer’s disease. All 71 participants spent approximately 2 hours on a desktop computer being tested on their ability to navigate a virtual maze comprising a series of interconnected hallways with four wallpaper patterns and 20 landmarks. Participants were tested on two navigation skills: how well they could learn and follow a pre-set route, and how well they could form and use a cognitive map of the environment. Participants were given 20 minutes to either learn a specified route or study and explore the maze with a navigation joystick. They were then tested on their ability to recreate the route or find their way to specific landmarks in the environment.

When compared with cognitively normal participants who lacked the cerebrospinal fluid markers of Alzheimer’s disease, those with preclinical Alzheimer’s disease scored lower on their ability to learn the locations of objects in the environment in relation to each other during the initial study phase. Although these results suggest deficits in the ability to form a cognitive map, preclinical Alzheimer’s disease participants eventually managed to overcome these map-learning deficits, performing almost as well as cognitively normal participants during a subsequent wayfinding navigation task.

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### Frailty and Chronic Health Conditions Linked to Lower Quality of Life for Older Women

Older women who are frail and have six or more chronic health conditions are twice as likely to have a lower quality of life compared to women with less than three risk factors, according to a study in the *Journal of the American Geriatrics Society*.

Researchers examined data from 11,070 frail women (ages 65 to 84) who were enrolled in the Women’s Health Initiative Observational Study, and found that the following risk factors can worsen a frail woman’s quality of life and increase the risk for death:

- heart disease;
- diabetes;
- lower weight;
- believing oneself is in poor or fair health;
- high blood pressure (>140/90);
- smoking; and
- old age.

Researchers suggested that managing chronic health problems may help older, frail women enjoy a better quality of life.


### Spouses May be Affected by Each Other’s Frailty and Depressive Symptoms

A study in the *Journal of the American Geriatrics Society* showed the frailest an older adult is, the more likely he/she will become depressed, and the more depressed he/she is, the more likely he/she is to become frail. The findings are based on a study of data from 1,260 married couples 65 and older, collected during the Cardiovascular Health Study.

Researchers found that individuals married to a frail spouse were likely to become frail themselves, and that those married to a depressed spouse were also more likely to become depressed. Older husbands tended to be more depressed and frail than younger husbands. Older wives were not more depressed, but were frailer, than younger wives.

Researchers concluded that frailty and depression symptoms may be intertwined for spouses, suggesting senior living facilities should consider ways to increase couples’ engagement in physical activities, social activities, and mutual support.


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Blood Analyses May Help Clinicians Assess Risk of Postoperative Delirium

New research in *Biological Psychiatry* may help clinicians assess a patient’s risk of developing postoperative delirium, enabling preventive measures to safeguard his/her health.

To look for potential blood-based markers of delirium, researchers screened plasma from adults 70 and older without dementia undergoing major non-cardiac surgery using data from the Successful Aging after Elective Surgery Study. Of 566 patients enrolled, 24% experienced delirium. Plasma was collected at four time points: preoperatively, in the postanesthesia care unit, on postoperative day 2, and at 1-month follow up.

High levels of C-reactive protein (CRP), which has been linked to inflammation and infection, emerged from an analysis of >100 proteins as being strongly linked to delirium. Compared with patients without delirium, those with delirium had significantly higher plasma CRP levels preoperatively, in the postanesthesia care unit, and on postoperative day 2, but not at 1-month follow up.

Although the relationship between CRP and delirium has been previously reported, this study is the first to document and analyze CRP levels before onset of symptoms.


Older Adults More Sensitive to Pain than Young Adults

New research in *Experimental Gerontology* suggests inflammation may occur more quickly and at a higher magnitude—and lasts longer—when older adults experience pain versus when younger adults experience pain.

Researchers studied eight healthy older adults (mean age = 68 years) and nine healthy younger adults (mean age = 21 years). None of the participants had illnesses such as diabetes or hypertension. During an initial visit, researchers induced pain either using heat applied to the feet or a cold ice bath. The first session determined how sensitive participants were to pain. Determining a tolerable temperature allowed researchers to recreate the same amount of pain for each participant in subsequent sessions. Participants rated their pain on a scale from 1 to 10. Researchers aimed to induce pain to a Level 4—a level that created the painful stimuli needed, but did not dissuade participants from returning for the remainder of the study.

To study inflammation in the blood, researchers inserted a catheter into each participant before inducing pain, which allowed them to collect blood before the pain stimulus and then at 3, 15, 30, 45, 60, and 90 minutes after the stimulus. These blood samples allowed researchers to study inflammatory markers in the blood, and they found that older adults had higher levels of inflammation when pain was induced than younger adults.


Most Men Never Screened for Osteoporosis

Screening women for osteoporosis is routine; however, most men are never screened and therefore experience consequences of the disease. In the United States, approximately 1.5 million men older than 65 have osteoporosis, and another 3.5 million men are at risk for developing the disease.

The American College of Physicians recommends men be assessed yearly for osteoporosis risk factors starting at age 50. The primary risk factor for men is family history, such as women in their family with osteoporosis or parents who experienced a hip fracture. Other factors that can raise the risk of osteoporosis are prescription steroid use, gastrointestinal disease, use of prostate cancer drugs, and alcohol abuse. The Endocrine Society recommends all men begin routine bone density screenings at age 70, as that is when the risk for osteoporosis increases.