HEALTH

THE FRONTIERS OF AGING WELL

Geroscience, a growing field of study, investigates longevity from new perspectives **By Sharon Oosthoek**

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Longevity science is having a moment. An aging population is driving a global economy catering to those over 60 that is now worth US$22 trillion, according to Susan Wilner Golden, a Stanford University business school professor and author of the 2022 bestselling book, *Stage (Not Age)*.

Big Silicon Valley players have jumped into the hopeful, and at times wacky, biotech market. American tech entrepreneur Bryan Johnson, 46, who wants to be 18 again, reportedly spends $2 million a year to de-age his body. His biohacking routine includes stem-cell injections to try to rejuvenate his joints, but last year he stopped plasma infusions from young donors because he saw no benefit. ➤

Google, with an investment from Apple chairman Arthur Levinson, 74, founded Calico Life Sciences in 2013 to investigate the biology of aging; it publishes dozens of research papers a year and hopes some of the 20 pharmaceutical compounds it's developing will one day treat cancer, neurological disease and tissue damage. OpenAI CEO Sam Altman, 39, is backing Retro Biosciences, which is on a mission to add 10 years to healthy human lifespans, in part by reprogramming old cells to act like younger ones. Researchers are now pivoting from treating specific diseases of old age to geroscience – a burgeoning scientific field that examines longevity from a new angle, looking at how the genetic, molecular and cellular mechanisms of aging might prevent or reduce the severity of a slew of age-related illnesses.

Bryan Johnson (right) was infused with plasma from Talmage (left), his teenage son, in a failed youth-boosting experiment.

To coordinate research in Canada, McGill University is launching the Canadian Translational Geroscience Network, which will convene its first meeting in September of scientists, academics, policy-makers and community stakeholders interested in healthy aging and longevity from biological, social and medical perspectives. "At this point, there are no compounds that have been shown to increase lifespan in humans," says McGill's Jeremy Van Raamsdonk, who studies how biological resilience contributes to longevity and neurodegeneration. Still, a 2020 review paper he and his colleagues wrote highlights five compounds – including the diabetes drug metformin – that have been shown to extend lifespan in fruit flies and worms, and to protect against neurodegenerative diseases in mice.

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Van Raamsdonk says the closest thing to a human experiment so far is the TAME (Targeting Aging with Metformin) Trial, which is managed by the American Federation for Aging Research and will treat people aged 65 to 79 with metformin. The goal is to see whether it might delay development or progression of age-related chronic diseases such as heart disease, cancer and dementia. (Both Johnson and Altman have added metformin to their anti-aging regimens.)

Of course there is more to geroscience than drugs. For example, Dean Ornish, founder of the California-based Preventive Medicine Research Institute, is leading a study to see if the progression of early-stage Alzheimer's disease can be stopped, slowed or even reversed through lifestyle changes such as eating a low-fat, low-sugar, plant-based diet, moderate exercise and stress management.

Similarly, at Western University in London, Ont., Angela Roberts is leading a research team studying the first Canadian cohort of SuperAgers, which is part of an international consortium involving 500 participants across North America.

"These are people 80-plus who have memory abilities at least as good as people in their 50s," says Roberts, who specializes in data analytics and digital health in cognitive aging. "This is a unique group whose cognitive function and brain atrophy do not change as rapidly as we might as we expect with age."

On average, eight to 12 per cent of people over 80 may be considered SuperAgers. To deepen understanding of what it might take to boost that number, Roberts and her team are currently recruiting SuperAgers to study their diet, activity levels, sleep habits and genes. They are especially interested in hearing from Black Canadians, a traditionally under-represented and understudied population.

Previous research shows SuperAgers have three key brain differences: a region called the anterior cingulate cortex – linked to decision-making and social interaction – is thicker; their brains resist the development of protein tangles associated with Alzheimer's; and they have a higher density of Von Economo neurons, which have been well studied in whales and elephants, but less so in humans.

"We think these neurons may drive pod and social behaviour in other species," explains Roberts. "This is interesting to us because one of the behavioural reports is that SuperAgers are more emotionally resilient and have deeper social relationships."

They also tend to be more physically robust. "They still have arthritis and hip issues like many people at that age, but they are also likely to be sailors, high-platform divers, track and field athletes," she says. SuperAgers are more likely to have more regular sleep habits too, and generally have set bedtimes and rising times.

"This project was founded on the principle that to understand what is going 'wrong' in aging, we needed to understand what was going 'right,'" says Roberts. "Linking biology and behaviour across disease and exceptional cognitive aging is very much a geroscience approach."

PHOTOGRAPHY, ELENA ZARETSKAYA/GETTY IMAGES (SYRINGE); COURTESY BRYAN JOHNSON (JOHNSONS)

THE GOLDEN AGE

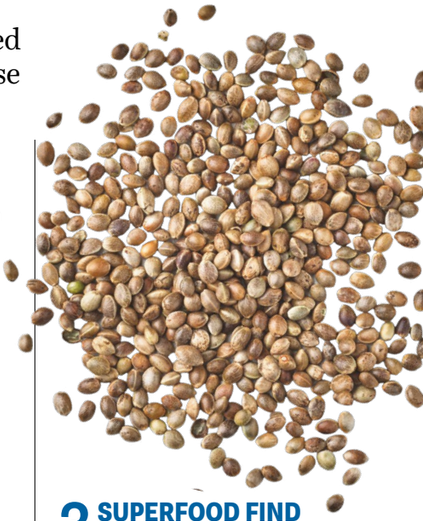
The coolest gadgets – from anti-aging pillows to AI-managed lipstick applicators – plus the latest in nutrition and exercise

1 ENVIOUS SLEEP

"This is the one pillow that reduces wrinkles, aligns our spine and gives us the best restorative sleep of our lives," co-inventor Kathy Young Keefe said in a 2015 *Dragons' Den* pitch, which propelled the Envy memory-foam pillow – a Health Canada-approved medical device – into clinics and spas across Canada and the U.S. The patented gull-wing shape offloads pressure from the face, preventing the vertical sleep wrinkles side sleepers (75 per cent of us) get when we smush our faces into our pillows, and alleviates jaw pain. Envy's cervical support helps relieve neck and back pain for side sleepers and back sleepers, while the copper-infused cases kill harmful microorganisms, reduce skin inflammation and preserve elasticity. If you're a stomach sleeper, flip over, because they say it may damage your face, neck and spine. *–Alyanna Denise Chua*

2 SCALE UP

Bathroom scales are stepping up their game – measuring body composition metrics such as body fat, bone density and muscle mass – and even your heart rate, which become more critical as we age. Smart scales send a weak electrical current through your body to measure resistance (water and muscle conduct electricity better than bone and fat), sending data via Bluetooth to an app. (Warning: The electrical signal may interfere with pacemakers.) One of the smartest is the sleek Wyze Scale X, with the ability to track 13 health indicators, reputed accuracy, budget-friendly price and recommendations from the *New York Times* and *Forbes*. If that doesn't tip the scale, check out Withings Body Smart, Eufy Smart Scale P2 or QardioBase X. *–ADC*



3 SUPERFOOD FIND

The hemp plant's brown, nutty seed may be on some vegetarian and vegan shopping lists given they're a rich source of vegetable protein, but here's the big reveal: Go straight to the soft heart. The shelled seeds, sold as hemp hearts, are easy to digest and can be sprinkled into your food. (Industrial hemp, although grown from cannabis plants, can't contain more than 0.3 per cent THC, the psychoactive ingredient in marijuana.)

The hearts contain all nine essential amino acids, healthy fats like omega-3 and omega-6, antioxidants such as vitamin E and the minerals iron, zinc, magnesium and potassium. *–ADC*

4 POWER MOVES

Cardio, balance and strength training are a familiar exercise trifecta, but now we need to add power – or strength, plus rapid movement. "Just about every activity of daily living that's going to limit you when you get older has to do with power," says Stuart Phillips, a McMaster University kinesiology professor in Hamilton, Ont., whose research on exercise and skeletal muscle health is often cited.

Getting out of chairs, going down stairs and dashing across intersections all require power, which decreases as we age, but exercises can put the brakes on dwindling vigour. Both strength and power training involve resistance, but the difference is speed. Power exercises include explosive movements, like box jumps, kettlebell swings and plyometric pushups – where you burst upward with enough force that your hands leave the ground – while strength exercises call for slower, more controlled repetitions.

"It's easier to prevent a decline in power rather than correct a decline that's already happened," Phillips says, recommending that people start power training in their 40s and 50s. *–ADC* ➤

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