The secret as to why some people live to 100 whereas others do not may be hidden in the metabolic profiles of centenarians and is established earlier in life. A new study found that people who lived to 100 tended to have lower — but not extremely lower — measurements of creatinine, glucose, and uric acid. The researchers also discovered that the metabolic profiles of centenarians were already established decades before their 100th year.

A new study has investigated what may be unique about people who live to be 100 years old and beyond. The study’s authors were looking for differences in body function prior to extreme old age that might expand our understanding of aging and longevity. This makes it the first piece of research to compare blood biomarkers measured at earlier stages of life for people who eventually lived to be centenarians against others who did not.

Their findings indicate that centenarians, by and large, were likely to have lower levels of glucose, creatinine, and uric acid than other people.

The median differences between centenarians and others were small, and centenarians rarely had values at either the low or high end of the healthy ranges, tending to remain in the middle ranges of measurement.

The researchers also found that eventual centenarians had settled into a metabolic profile by age 65, 35 years before reaching the century mark.

The study is published in GeroScience.

Measuring 12 blood biomarkers

Due to improved life expectancies globally, older adults, including people living past the age of 100, are the fastest-growing age group. In 2015, there were nearly half a million centenarians alive, and it is predicted that by 2050 there will be 3.7 million people worldwide who are older than 100.

The study’s authors analyzed data from over 44,000 Swedes enrolled in the population-based AMORIS (Apolipoprotein MOrtality RISk) cohort. They then measured the participants’ biomarkers between 1985 and 1996, and followed these until 2020.
The researchers looked at 12 blood biomarkers of metabolic status and function.

These included total cholesterol and glucose, as well as alanine aminotransferase (Alat), aspartate aminotransferase (Asat), albumin, gamma-glutamyl transferase (GGT), alkaline phosphatase (Alp), and lactate dehydrogenase (LD), which are related to liver health.

They also tracked creatinine, a marker of kidney status, as well as iron-binding capacity (TIBC) and iron, which measure anemia. They assessed nutrition via a measurement of albumin.

The authors concluded that values for nearly all the biomarkers were distinctive in centenarians, except for alanine aminotransferase and albumin.

**Differences in creatinine, glucose, and uric acid**

Dr. Mireille Serlie, professor of endocrinology at Yale, who was not involved in the study, told Medical News Today that creatinine “is dependent on renal [kidney] function and muscle mass.”

“The lower creatinine in this age group (mean age at first biomarker testing in centenarians was 79.6 years) is compatible with higher renal function,” she said.

Looking for lifestyle clues in centenarians’ biomarkers is a speculative game. However, Dr. Serlie noted that “Lifestyle is associated with renal function through salt intake, hypertension, obesity, hyperglycemia, cardiac function, etc.”

“*So, higher renal function in this group could be a readout for a better overall lifestyle and diet. This is also true for glucose,*” said Dr. Serlie.

Slightly lower uric acid levels suggest that centenarians did not have issues with kidney stones, kidney disease, or gout. However, having too low a level of uric acid is problematic in its own right, which may lead to neurological problems.

**Why having average blood readings may be better**

The study reflects the multiple possible implications of different biomarker measurements. Dr. Serlie explained by example, citing iron, TIBC, and albumin, which may say something about nutrition.

“Taking levels of iron, TIBC, and albumin as markers for nutritional state might be less suitable because they can be influenced by inflammation or chronic illness. A lower albumin does not necessarily signal malnutrition. And iron levels can be low during illness. This is then also not reflective of a nutritional deficiency, per se,” she said.
People whose metabolic profiles and blood readings were more extreme were least likely to reach 100.

This includes people who had the lowest levels of total cholesterol and iron, as well as those with the highest levels of glucose, creatinine, uric acid, and liver-function biomarkers.

**Two types of centenarians**

While the biomarker profiles of centenarians were very similar, the researchers found that there are two clusters of centenarians. They differed in biomarkers apart from the ones that distinguished them from non-centenarians: total cholesterol, albumin, and TBIC.

“These biomarkers are all related to nutrition,” the study’s first author, Dr. Shunsuke Murata told *Medical News Today*. “One group were more similar to non-centenarians, and we named it ‘higher nutrition.’ The other group had somewhat more favorable levels, and we named it ‘lower but enough nutrition.’”

“We can only speculate on what is behind the difference, for example, caloric restriction,” he noted.

**The meaning of centenarians’ metabolic sweet spot**

“When we stress that centenarians overall experienced more compressed values, we mean that they more seldom displayed extreme values of the biomarkers. For example, almost none of the centenarians had a glucose above seven earlier in life, while such extreme values were more common in non-centenarians,” Dr. Murata explained.

Perhaps this affected non-centenarians’ relative lack of longevity, he said.

> “It is difficult to say if the absence of extreme values point towards lifestyle. But the findings of overall more favorable values for centenarians, and the fact that these markers are related to diet and lifestyle, it is possible — or perhaps even likely — that such factors have an impact. What we cannot know is to what extent genetic factors interact with this.”
> — Dr. Shunsuke Murata

**The fact, however, that centenarians’ biomarker profiles are in place so much earlier in life may provide a clue.**

“This speaks against chance only, or genetic only, as factors for reaching exceptional age,” hypothesized Dr. Murata.

“To fully answer the question of why, we would need more information, ideally about genetics, lifestyle factors, and biomarkers within the same cohort of people,” he added.
Meanwhile, other researchers are focused specifically on lifestyle and longevity, asserting that lifestyle and diet play a significant role.