15 Biomarkers That May Predict SuperAger Brains

5 MIN READ

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A new study used machine learning and blood data to identify biomarkers linked to extraordinary cognitive health after 65.

What if a simple blood test could flag whether your brain is aging better than average? Thatâ??s the premise of a small but compelling new study published in ***Nature*** *Scientific Rep*orts. Researchers set out to decode what makes â??SuperAgers,â?• people over 65 with memory and mental function rivaling folks in their 40s, so resilient. And they found clues not in the brain, but in the blood.

Using advanced machine learning techniques on just 81 individuals, the team identified 15 blood biomarkers that could predict exceptional cognitive performance with over 75% accuracy. These markers werenâ??t exotic. They were largely metabolic, inflammatory, or related to liver, immune, or vascular health, all things your standard blood panel might already be checking. What matters is the pattern.

While more research is needed before doctors can act on these findings, this study offers a fresh way to think about aging well: cognitive resilience may start in the bloodstream.

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A Nuanced Metabolic Profile: 15

Biomarkers Linked to SuperAgers

The researchers compared 39 SuperAgers with 42 typical agers and looked at 55 common and advanced biomarkers. They then used a machine learning model to identify the most predictive ones.Â

Not all biomarkers behave the same way. Some clearly support **brain health** when they fall within a certain range. Others have more complex effects, helping one area of thinking, like memory, while having a different impact on attention or problem-solving. In some cases, a level thatâ??s good for one brain function might not be ideal for another. Here are the 15 biomarkers associated with SuperAger status, according to this research, and what we know about them.

1. Glucose
Bidirectional effects were observed. Levels below 92 mg/dL supported attention, visual memory, and visuospatial skills. Interestingly, levels above 100 mg/dL were associated with better verbal memory and frontal executive function.

2. HDL Cholesterol
Higher HDL (>54 mg/dL, particularly >60 for women) consistently contributed to SuperAger classification and supported performance across language, memory, and frontal domains. This threshold exceeds standard cardiovascular targets.

3. ALT (Alanine Aminotransferase)
Levels above 17 U/L were positively associated with SuperAger status, especially in frontal and visuospatial domains, suggesting liver health may quietly support brain resilience

4. MCHC (Mean Corpuscular Hemoglobin Concentration)
Lower values (<34 g/dL) were associated with SuperAger status, though the mechanism remains unexplored in the study.

5. AGE (Advanced Glycation End-products)
Higher levels (>15 ng/mL) surprisingly aligned with SuperAger classification, challenging conventional thinking and indicating the need for more research.

6. oxLDL (Oxidized LDL)
Lower levels (<51 ng/mL) were linked to SuperAger status and better performance in visual and visuospatial domains.

7. CD36
A receptor involved in lipid metabolism and immune signaling, CD36 levels above 40 ng/mL were associated with better visual memory and visuospatial performance.

8. Insulin
Insulin sensitivity, not just level, may be key. Insulin showed up as an important signal, but more insulin in your blood wasnâ??t better; it was actually tied to weaker performance in certain thinking skills. What really matters is how sensitive your body is to insulin, or how well your cells respond, because thatâ??s what keeps blood sugar stable and the brain fueled.

9. Phosphorus
Associated with visuospatial function, phosphorus likely plays a role in neuronal signaling and plasticity.

10. LDL Cholesterol
Its impact varied by cognitive domain. Extremely low levels (<70 mg/dL) were not universally beneficial, suggesting the need for balance.

11. RDW(CV) (Red Cell Distribution Width)
Lower variation (<12.5%) in red blood cell size was associated with better visuospatial performance.

12. Chloride (Cl)
Levels above 107 mmol/L exceeded typical clinical ranges and contributed to SuperAger prediction, possibly via roles in neurotransmission.

13. Leptin
Included as a key predictive biomarker. While domain-specific effects were not detailed, its role in metabolic regulation suggests relevance.

14. Vimentin

A cytoskeletal protein involved in inflammation, Vimentin was part of the final predictive model and linked to visuospatial and visual domains.

15. RAGE (Receptor for Advanced Glycation End-products)
Also included in the final set. RAGEâ??AGE interactions are known to trigger neuroinflammatory cascades, suggesting relevance to cognitive aging.

The Bigger Insight

Most of these biomarkers fell within normal clinical ranges but hovered near the high or low ends. Some, like HDL and Cl, even exceeded standard thresholds for general health. That matters. Because it suggests that whatâ??s â??optimalâ?• for cognitive resilience in aging may not be the same as whatâ??s considered â??normal.â?•

This is not a call for self-diagnosis. But it does hint at a future where your routine lab results, interpreted through a cognitive lens, could become tools for early intervention, personalized brain health strategies, and ultimately, a longer, sharper life.

What You Can Do Now

While you donâ??t need a machine learning algorithm to live longer and stronger, this research reinforces some practical steps:

- **Keep fasting glucose under control.** Talk to your doctor about your levels. You can support insulin sensitivity with everyday choices like regular movement, eating more fiber and protein, getting enough sleep, and managing stress.
- **Raise your HDL.** Omega-3s, exercise, and cutting trans fats are all good bets.
- **Support your liver.** A Mediterranean-style diet, moderate (or no) alcohol use, and avoiding processed foods help ALT levels stay optimal.
- **Ask for a full lipid and metabolic panel.** If youâ??re over 40, track trends, not just ranges.
- **Talk to your doctor.** Bring up research like this and explore which proactive labs make

sense for you.

Your brain health doesnâ??t just live in your head. It lives in your blood, your metabolism, and your daily habits. And thatâ??s good news because it means you have more influence than you think.

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