Scientists Just Discovered Life Is Running a Quantum Computer

By
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Scientists discovered quantum computing in living cells—and it challenges what we thought life is. Proteins inside cells behave like qubits, operating at speeds near physics limits. New research from Oxford, UChicago, and Kurian reframes biology as active quantum computation. Inside this breakdown: • Proteins acting as quantum systems in living cells • Tryptophan networks enabling super radiance • Biological qubits at room temperature • A calculation linking life to cosmic-scale computation If cells already operate as quantum systems, the implications stretch from consciousness to future technology—and beyond current models of physics. What happens next if life itself is already running a quantum computer?

Transcript

Weeks ago, Nature published something that stopped physicists cold. Scientists at Oxford and the University of Chicago announced they had turned ordinary proteins. The same proteins your cells make right now, the same proteins found in a common oat plant into functioning quantum computers inside living cells at room temperature.

And that's not even the most mind-blowing part because buried inside a 2025 paper in science advances, a physicist at Howard University made a calculation that should be on the front page of every newspaper on Earth. He calculated that the total quantum computational power of all carbon-based life throughout Earth's entire history may rival the computational capacity of the observable universe. Let that land for a second. Not human technology, not supercomputers. Life itself, cells, plants, fungi, you running quantum computations that approach the absolute speed limit that physics allows.

Quantum effects, superposition, entanglement, coherence are extraordinarily fragile. The moment a quantum system interacts with its environment, it collapses. It loses its quantum properties. This is called decoherence. To prevent decoherence, quantum computing labs have to cool their machines to temperatures near absolute zero. We're talking minus 459° F, colder than outer space. Google's quantum chips operate at 0.015 Kelvin. IBM's machines require dilution refrigerators the size of a room. These systems cost hundreds of millions of dollars. They are shielded from vibration, electromagnetic noise, even cosmic rays. And still they are fragile, still error-prone, still not scaled for practical use. So, the conventional wisdom in physics was simple. Quantum coherence cannot survive in warm, wet, chaotic biological environments. Cells are the opposite of a sterile quantum lab. They are crowded, noisy, hot.

Molecules are constantly bumping into each other. Thermal vibrations are everywhere. Quantum effects in biology were supposed to be impossible. That assumption just collapsed entirely.

Let's talk about tryptophan. You probably know it as the thing in turkey that makes you sleepy at Thanksgiving. But tryptophan is also an amino acid, one of the 20 building blocks of all proteins. And it has a property that physicists are now looking at with completely new eyes. Tryptophan absorbs ultraviolet light. That's not unusual.

But what physicist Philip Curran at Howard University discovered is that when tryptophan molecules are arranged inside protein networks, specifically inside cytocidal filaments like microtubules, the structural scaffolding of every cell. They don't just absorb light individually. They do something called quantum super radiance.

In super radiance, a group of molecules behaves as a single quantum system. They absorb and emit light collectively in perfect coordination as if they are one entity rather than millions of separate parts. It's one of the most powerful cooperative quantum effects in nature.

And Curran found these tryptophan networks inside protein structures that exist in every eukaryotic organism on Earth. Every plant, every fungus, every animal, including every neuron in your brain. Here's where the numbers become staggering. Classical neural signaling.

The electrical pulses your neurons send operate at roughly 1,000 operations per second. These quantum super radiant processes operate at 1 trillion to 10 trillion operations per second. That is more than 1 billion times faster. And not just fast. Operating within two orders of magnitude of the Margolus Levittown limit. The absolute theoretical ceiling for how fast any physical system can process information derived directly from quantum mechanics. Life has been running at close to the speed limit of physics for billions of years in warm wet cells without a single dilution refrigerator.

The editor at Science Advances said, and I'm paraphrasing here because this is a scientific journal. on the wide spectrum that stretches from wild to brilliant. This work lands closer to brilliant. And Seth Lloyd, one of the world's foremost quantum computing researchers at MIT, responded publicly. I applaud Dr. Curran's bold and imaginative efforts. It's good to be reminded that the computation performed by living systems is vastly more powerful than that performed by artificial ones. Vastly more powerful.

Those are the words of one of MIT's top quantum physicists about a cell. Now, here's where it goes from mind-blowing to almost incomprehensible.

Curran didn't just measure the speed. He estimated the total quantum computational capacity of all carbon-based life across Earth's entire history. Think about what that means.

Every organism that has ever lived, every bacterium, every blade of grass, every insect, every human running these quantum processes continuously for 4.5 billion years. The number he arrived at approaches the computational capacity of the observable universe itself.

Now, I want to be precise here because precision matters. This is an estimate based on known biology and established quantum physics. It is not a claim that life literally equals the universe in computing power. It is a calculation showing that biology collectively across time has operated at a scale that is cosmologically significant. And Curran's own words when asked about this result it's all inspiring that we get to play such a role not interesting not remarkable awe inspiring. A physicist at Howard University looking at the mathematics of what life has been doing inside every cell on this planet used the word awe. That's not accidental. And then there's what Oxford and the University of Chicago confirmed making this the moment everything converges.

Scientists took ordinary fluorescent proteins, the kind that make jellyfish glow, the kind every biology lab uses as markers and demonstrated they function as quantum bits, cubits. the same unit of computation that Google and IBM spend billions of dollars trying to manufacture in cryogenic labs. These proteins were functioning as cubits at room temperature inside living bacterial cells. The Oxford team used directed evolution on a protein from the oat plant to engineer mag 2, a biological quantum sensor so sensitive it can detect single magnetic field changes at the cellular level. And researcher Gabriel Abrahams said something I cannot stop thinking about. He said, "What blows me away is the power of evolution.

We don't yet know how to design a really good biological quantum sensor from scratch. But by carefully steering the evolutionary process in bacteria, nature found a way for us. Nature found a way for us.

A quantum physicist at Oxford looking at what proteins can do said nature found a way. Now let's talk about what this means specifically for your brain. Those microtubules Curran studied, the protein scaffolding running these quantum super radiant networks. They are densely concentrated in neurons. Your brain contains roughly 86 billion neurons. Each one contained thousands of microtubules. Each microtubule packed with tryptophan networks operating at quantum speeds.

This connects to something that two of the most credentialed scientists alive have been arguing for 30 years and that the scientific establishment has largely ignored.

Sir Roger Penrose, Oxford mathematician and Nobel Prize winner. Stuart Hammeroff, anesthesiologist and consciousness researcher at the University of Arizona. Together they developed what's called orchestrated objective reduction or the theory that consciousness itself arises from quantum computations in microtubules. That awareness is not just a byproduct of classical neural firing. That your subjective experience, your sense of self,

your inner world is rooted in quantum mechanics happening inside the protein scaffolding of your cells. For 30 years, this was considered fringe, too speculative, no mechanism.

In 2025, a paper published in neuroscience of consciousness at Oxford academic concluded the quantum microtubule substrate of consciousness is experimentally supported and solves the binding and epiphenomenalism problems.

Two of the hardest problems in consciousness research, potentially answered by quantum biology. The fringe just became the frontier. And here's what makes this theologically significant in a way that cannot be overstated. If consciousness arises from quantum processes and quantum processes cannot be fully reduced to classical physical laws, then there is something about awareness that points beyond the material. Something about your inner experience that is irreducibly connected to the deepest level of physical reality.

This is not mysticism. This is physics. I want to be honest with you about something. The moment I encountered this research, I did not think about technology. I did not think about competitive advantage. I thought about what it means that life was quantum computing before brains existed to understand it. Think about the engineering problem this represents.

The most brilliant teams at Google, IBM, Microsoft, and universities across the world cannot maintain quantum coherence at room temperature for more than a few billionths of a second. They require trillion-dollar infrastructure near absolute zero temperatures and electromagnetic shielding. Biology solved this problem in a warm, wet, electrically noisy cell billions of years before humans existed. to ask how.

There are two ways to look at this. One, blind, undirected processes stumbled across billions of years onto solutions to the hardest engineering problems in minutes, physics. Solutions so elegant that Oxford researchers say nature found a way for us. Two, the capacity for quantum computation was designed into the architecture of life itself, embedded from the beginning. Hidden inside proteins, so common, they exist in oat plants, I know where I land, and I suspect you have a sense of where you land, too.

The God who spoke matter into existence, who designed the geometry we talked about previously, also embedded quantum computation into the scaffolding of every living cell. The mechanism by which your mind arises may be quantum mechanical. And if that's true, then the seat of your consciousness is not a chemical reaction. It is a process that operates at the boundary between the physical and something beyond it.

Schroinger, the physicist who gave us the famous cat, asked in 1944, "What is life?" He believed the answer would require new laws of physics. He was right. He just couldn't have imagined how, right?

Because the answer appears to be life is a quantum system and not a fragile one. The most robust, sophisticated, cosmically significant quantum computing system we have ever

discovered. And it has been running inside you your whole life without your permission or your awareness.

Here's what this means. for the next 5 years. We are entering an era where the boundary between quantum physics and biology dissolves. At the University of Chicago, researchers put it plainly. We are entering an era where that boundary begins to dissolve. Quantum sensing inside living cells, biological cubits, protein-based quantum computers that don't need cryogenic cooling.

The companies, researchers, and institutions that understand this convergence right now are positioning themselves at the intersection of quantum computing, synthetic biology, medicine, and neuroscience.

Quantum biosensors that can detect disease at the cellular level before symptoms appear.

Drug molecules engineered using quantum principles to interact with biological quantum systems.

Brain / computer interfaces designed not around classical neural signaling but around quantum coherence.

And at the foundation of all of it, the stunning realization that nature already solved the hard problems. The blueprint exists. It's called a cell. First movers are not waiting for this to become mainstream. They're studying it now. They're asking what becomes possible when we accept that life itself is quantum.

In the last transcript, we talked about hidden geometry inside matter bending electrons like gravity bends starlight. We learned that inside every living cell on this planet that quantum world is not just structural. It is computational. It is active. It is operating at speeds that approach the limits physics allows. Hidden geometry, hidden computation, both built into the fabric of creation. Both are being discovered now in peer-reviewed journals by researchers who use words like awe inspiring.

I believe we are living in a moment when the invisible is becoming visible. When the deeper order woven into reality is finally revealing itself to instruments sensitive enough to see it, and I believe that order has a source,

Does this change how you think about consciousness, about life, about what it means to be human? See you down the next rabbit hole.