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# 'Mitochondrial Dysfunction' Is Not Dysfunction: Experts

Deep within the cells of your body, tiny energy powerhouses —mitochondria—may hold the key to recovery.



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Deep within the cells of your body, tiny energy producers —mitochondria—may hold the key to recovering from the most confounding chronic diseases and infections.

## ‘Mitochondrial Dysfunction’ Could Be a Sign of Healing

Known as the “powerhouses of the cell,” mitochondria’s primary function is to generate the energy necessary to power cells. But scientists like Dr. Robert Naviaux, who leads the Mitochondrial and Metabolic Disease Center at UC San Diego, have pointed out that the time for thinking of mitochondria only as the powerhouses of the cell has passed.

When a person battles infections, chronic diseases, and injuries, mitochondria produce less energy and become inflamed and oxidative. This can lead to fatigue, lethargy, and organ dysfunction due to reduced energy output and the body’s response to inflammation and oxidative stress.

Mainstream medicine labels this as “mitochondrial dysfunction,” implying that mitochondria aren’t producing as much energy as they should.

However, when mitochondria are misbehaving in such a way, they are doing so in response to changes in cellular signaling. What would be considered “dysfunction” if the cell were safe becomes a protective and essential new function of mitochondria under conditions of cell danger. Therefore, it is not a breakdown but a response essential to healing, according to some scientists.

“The decreased ability to make energy could be an adaptation for something else,” Martin Picard, who holds a doctorate in mitochondrial biology and is an associate professor of behavioral medicine in psychiatry and neurology at Columbia University Irving Medical Center, told The Epoch Times.

Another theory is that mitochondria must become inflammatory and oxidative at the beginning of any infection, injury, or toxic exposure to facilitate the body's healing process. When this normal acute signaling becomes chronic, cells become overly sensitive to such signaling, and the symptoms of chronic disease result, according to Dr. Naviaux.

## Injured Cells Heal Themselves in 3 Phases

Dr. Naviaux reasoned that there is a three-phase process cells have to undergo to heal from injury. He termed it the cell danger response (CDR).

Triggers vary, but the recovery steps are the same, he said. All injured cells must undergo these processes to regain a healthy state.

Mitochondria coordinate each of the following phases:

### Phase 1: Inflammation

Damaged cells release danger signals, cutting connections with surrounding cells to prevent the spreading of infection or toxins. Mitochondria become inflammatory and oxidative. "The job of a [phase 1] mitochondria is to create oxidants. This initiates the first phase of the healing cycle. It is an essential kind of cellular stress that diverts energy and resources needed to fight the infection and recover from the stress," Dr. Naviaux said.

### Phase 2: Proliferation

Once the immediate danger has been cleared, new cells are produced to replace damaged ones. The cell switch from anaerobic respiration, which does not use oxygen, to aerobic glycolysis, meaning they start to consume oxygen again. The little energy made at this time is essential for creating the new building blocks for the production of new genes, proteins, fats, and cellular material to replace the cells lost during infection or injury.

However, it should be noted that most of the energy produced at this time is still formed in the absence of mitochondria.

### Phase 3: Differentiation

Mature cells train the newly made cells. Cells reconnect with each other, and mitochondrial metabolism becomes anti-inflammatory, returning to baseline functions after the danger has passed.

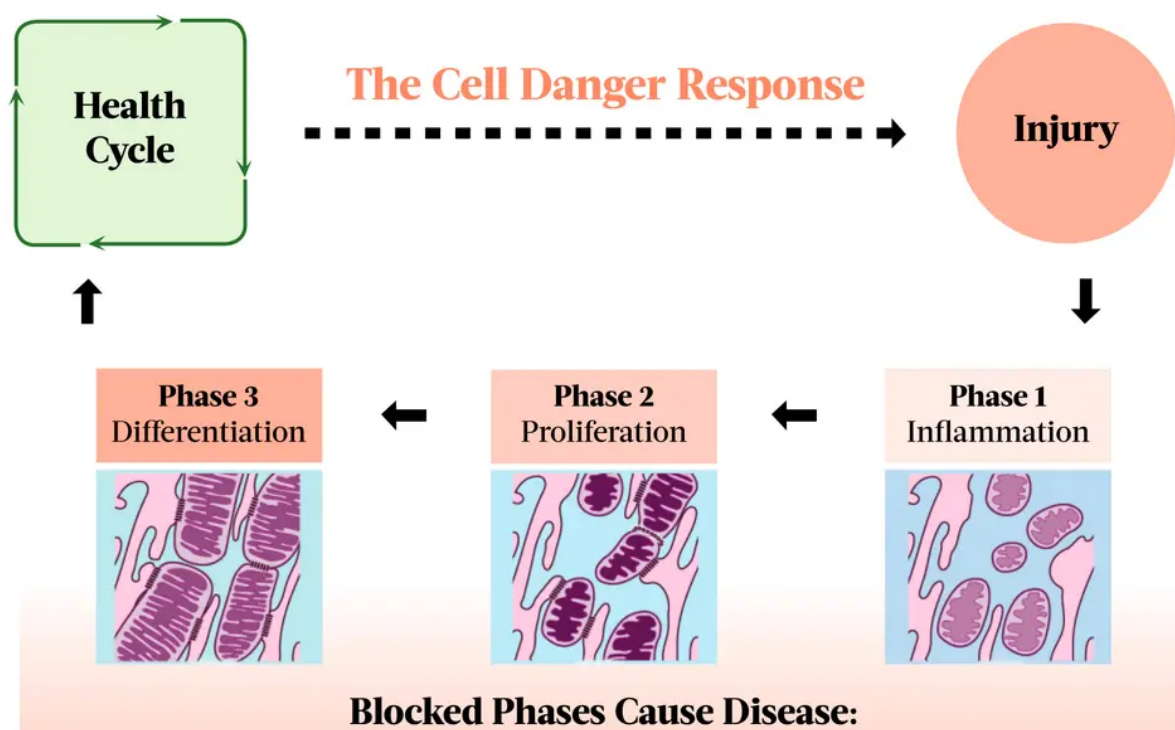
After completing phase 3, cells return to their healthy state.

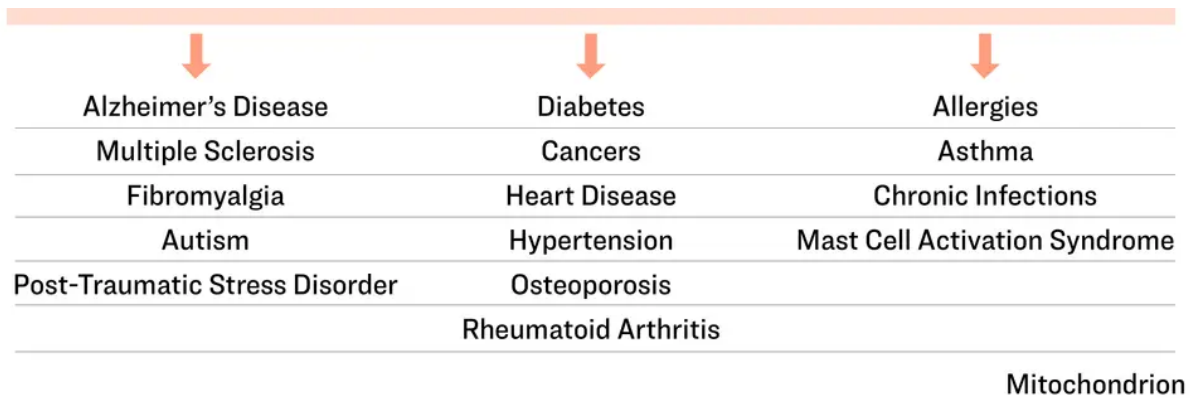
## When Healing Goes Haywire, These Diseases May Occur: Expert

What happens when cells cannot complete all the phases, making them stuck in a particular phase? Chronic disease.

With any injury, some cells may remain forever trapped in one of the three phases. This is why cuts can form scars and why certain infections may leave people never feeling the same again. Over time, enough of these blocked cells can lead to chronic disease symptoms.

For example, cells stalled in phase 1 exhibit ongoing inflammation. This is seen in chronic infections, asthma, Lyme disease, and mast cell activation syndrome. Cells stuck in phase 2 display excessive proliferation, as in cancer and Type 1 diabetes.





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(Courtesy of Robert Naviaux/The Epoch Times)

Another way of examining this blocked state in chronic disease is the lack of communication within diseased cells.

Health requires communication between mitochondria. But injury severs this connection until the cell danger response restores it. “This kind of biological communication is vital because losing those alone causes disease,” Mr. Picard said in a TEDx talk.

Impaired communication causes disease—depression from poor neuron connections and Alzheimer’s from reduced brain communication, he noted. “The ultimate loss of communication between cells causes cancer,” Mr. Picard added.

### ‘Unblocking’ Healing

Dr. Naviaux has researched ways to unblock cells stuck in the individual phases so cells can recover.

His research has shown that ATP, the energy source created mainly by mitochondria for use and storage at the cellular level, initiates the cell danger response. Therefore, he focused on anti-purinerbic drugs that block ATP from prolonging the defense mechanism.

High ATP levels outside cells cause the cells to get stuck in a phase. ATP declines as cells progress from phase 1 to 3. Of the ATP-blocking drugs studied, only one improved symptoms in all test subjects, Dr. Naviaux found

NAVIAUX FOUND.

## Suramin

Suramin is an anti-parasitic drug used for over a century to treat African sleeping sickness. Though not FDA-approved in the United States for any use yet, Dr. Naviaux tested it in a small, randomized, controlled clinical trial involving 10 autistic children in 2017 and found it safe and highly effective.

A day into the clinical trial, one child said, “I finished my dinner”—his longest sentence after starting the medication. A nonverbal child began practicing sounds and expressed a food desire within the first week.

Suramin works by blocking cell receptors to ATP, helping reset the prolonged cell danger responses.

Animal studies show suramin may also treat heart failure, multiple sclerosis, chronic pain, arthritis, and more chronic conditions.

## Electromagnetic Fields

Electromagnetic fields, which influence electron/atom flow in the body, may also help unstick stalled healing phases.

Some doctors have used microcurrents, which can change the flow of electrons in specific tissues and organs, to improve mitochondrial function and tissue repair.

Chiropractor Carolyn McMakin, who developed Frequency Specific Microcurrent, a technique for treating pain with low-level electrical current, has targeted frequencies to treat scarring, inflammation, and pain—all signs of incomplete healing.

Scott Marsland, a nurse practitioner, has found wearable microcurrent devices have been helpful in treating fatigue in long-COVID and vaccine-injury patients. This may be a sign the mitochondria are moving out of a persistent state in a specific phase.

“I find microcurrent to be really helpful for people who can’t get over



that stage,” Dr. Shannon Bybee, a functional medicine physician from The Hansell Center for Functional Medicine, told The Epoch Times. She also tries to unblock trapped emotions like anger and fear that manifest in certain tissues.

“As I’m [treating and] talking to the patient, I listen for key words; is there anger, is there fear, is their unwillingness to change?” Dr. Bybee said. “Surprisingly, the [emotions] are usually along the lines of the Chinese meridians; when we talk about anger being trapped in the liver, and fear and anxiety being trapped in the stomach.”

Some evidence suggests that stem cells may be able to remember previous wounds and traumas, which could explain why injuries may persist in tissues even when the initial cause of the injury is long gone.

## Traditional Chinese Medicine

Traditional Chinese medicine (TCM) overlaps with the cell danger response model. Central to TCM is qi—the vital energy within all things. Health requires proper qi flow; an imbalance causes disease. Most of the work TCM doctors do is correcting and balancing qi in the body.

Qi forms from food and air, resembling mitochondrial energy, Dr. Jingduan Yang, psychiatrist and TCM practitioner, told The Epoch Times.

Like stalled cell processes, qi can also become stuck.

## Acupuncture

Acupuncture unblocks stuck qi. Research shows it helps treat scars, which are signs of incomplete healing.

“In Chinese medicine, we’re told that a scar is a disruption in the flow of energy across a channel,” Anthony Fazio, who has a doctorate in acupuncture and Chinese medicine and is a licensed acupuncturist and TCM practitioner, told The Epoch Times. By treating scars, he said he has seen rapid improvement in unexplained symptoms.

Mr. Fazio treated a patient with severe wrist surgery scarring who underwent a second operation requiring titanium plates and an implanted pain reliever. The patient had constant pain radiating from his wrist up to his neck and lower back, using the implant up to 10 times a day for relief. “So I started working on all the scars on a weekly basis,” Mr. Fazio said.

After two months, the patient only used the implant at night. By the third month, he stopped entirely. At six months, the patient asked for the removal of the implant.

## Herbs

Some TCM herbs may also help treat persistence in certain cell danger response phases.

For example, the flavonoid baicalin, extracted from a TCM herb called huangqin (Chinese skullcap root), may help cells progress through the cell danger response by blocking ATP receptors.

## Mitochondrial Supplementation for Symptomatic Support

Dr. Nancy O’Hara, a pediatrician who treats neurodevelopmental and sudden-onset neuropsychiatric diseases, sometimes prescribes nutraceuticals that support the mitochondria, hoping to coax the stalled healing phases forward.

Some of these include vitamin D to calm inflammation and aid energy production, glutathione and sulforaphane extracted from broccoli seeds as antioxidants, and alpha-lipoic acid to reduce oxidation.

While not directly unblocking pathways, these nutraceuticals provide nutritional support so mitochondria have what they need to recover when ready.

Children with neurodevelopmental and neuropsychiatric diseases due to the persistent mitochondrial dysfunction may see their



due to the persistent mitochondrial dysfunction may see their symptoms reversed.

Some people's mitochondria may never be ready and may never heal. However, most children improve with supplementation and lifestyle changes like a clean diet, enough restful sleep, and exercise, all of which can enhance communication between mitochondria and help with natural detoxification processes.

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