HOME

Scientists Link Parkinson's to Gut Bacteria—Could Two Common Vitamins Hold the Key?

By bestfolkmedicine · 21/10/2026 · 12 min read



Groundbreaking research from Japan suggests that changes in gut bacteria may interfere with two essential B vitamins, potentially contributing to Parkinson's disease. Now scientists are investigating whether restoring these nutrients could offer a surprisingly simple new approach to treatment.

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What if an important clue to Parkinson’s disease wasn’t hidden in the brain—but in the gut?

For decades, scientists have focused on the progressive loss of dopamine-producing neurons in the brain as a defining feature of Parkinson’s disease.

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But an increasingly compelling body of research suggests that the digestive system may play an important role in the disease’s development and progression.

Now, researchers from Nagoya University in Japan have identified a fascinating connection between intestinal bacteria and two familiar nutrients: vitamin B2 (riboflavin) and vitamin B7 (biotin).

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Their findings suggest that changes in the gut microbiome may reduce the capacity of certain bacteria to produce these vitamins, potentially influencing intestinal health and neurological function.

Even more intriguing, the researchers proposed that vitamin supplementation might eventually help selected patients.

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However, there is one crucial distinction: this is a promising scientific hypothesis, not proof that B vitamins can cure or slow Parkinson’s disease.

The discovery nevertheless raises an important question: Could protecting the gut help protect the brain?

The Surprising Connection Between Parkinson’s Disease and the Gut

Parkinson’s disease is a progressive neurological disorder that affects movement, coordination, and numerous other bodily functions.

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It develops as dopamine-producing nerve cells in a region of the brain called the substantia nigra become damaged or die.

Dopamine helps regulate smooth, controlled movement.

As dopamine-producing neurons are lost, people may experience symptoms such as tremors, stiffness, slowed movement, and balance difficulties.

But movement problems aren't always the earliest warning signs.

In fact, some people experience digestive disturbances years before receiving a Parkinson's diagnosis.

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Constipation is among the most recognized early non-motor symptoms of Parkinson's disease.

Other symptoms may include sleep disturbances, reduced sense of smell, and changes in mood.

These observations have led scientists to investigate whether certain disease-related processes could begin outside the brain.

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One major area of interest is the gut microbiome.

What Scientists Discovered About Gut Bacteria

In a study published in npj Parkinson's Disease in May 2024, researchers led by Hiroshi Nishiwaki and colleagues examined gut microbial patterns associated with Parkinson's disease.

The team analyzed stool samples from 94 people with Parkinson's disease and 73 healthy controls in Japan.

They then compared these findings with five previously published datasets from the United States, Germany, China, and Taiwan.

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This international approach helped researchers identify microbial changes appearing across different populations.

The findings revealed several noteworthy differences.

People with Parkinson's disease tended to have reduced levels of certain bacteria associated with producing beneficial compounds in the digestive tract.

These included Faecalibacterium prausnitzii and Roseburia intestinalis.

Meanwhile, Akkermansia muciniphila was increased.

But the most intriguing discovery involved bacterial genes responsible for producing two B vitamins.

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Researchers identified a significant reduction in microbial pathways involved in the synthesis of riboflavin and biotin.

This observation suggested that alterations in gut bacteria might influence the biochemical environment of the intestine.

The researchers proposed that these changes could contribute to mechanisms involved in Parkinson's disease.

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Two Ordinary Vitamins Suddenly Became the Focus of Attention

The two nutrients highlighted by the study are neither rare nor exotic.

They are essential vitamins found in everyday foods.

Yet their potential connection to Parkinson's disease has attracted scientific interest.

Vitamin B2: Riboflavin

Riboflavin is a water-soluble vitamin involved in energy production, cellular metabolism, and antioxidant defense.

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The body needs vitamin B2 to help enzymes perform numerous essential functions.

It also plays a role in maintaining normal cellular health.

Foods containing riboflavin include:

- Almonds
- Mushrooms

- Eggs
- Milk and yogurt
- Spinach
- Fortified grains and cereals

Because nerve cells require substantial amounts of energy, scientists are interested in how changes in nutrient availability and cellular metabolism might influence neurological health.

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However, eating riboflavin-rich foods has not been demonstrated to prevent Parkinson's disease.

Vitamin B7: Biotin

Biotin is another water-soluble B vitamin.

It helps enzymes process fats, carbohydrates, and amino acids.

It also contributes to normal energy metabolism and several cellular functions.

Dietary sources include:

- Cooked eggs
- Nuts and seeds
- Legumes
- Sweet potatoes
- Mushrooms
- Salmon

Like riboflavin, biotin can also be synthesized by certain intestinal microorganisms.

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Researchers are investigating whether changes in microbial vitamin production influence the intestinal environment in people with Parkinson's disease.

Importantly, lower bacterial capacity to synthesize these vitamins does not automatically mean patients have a clinical vitamin deficiency.

The amount of vitamin produced by gut bacteria, its availability to the body, and its relationship to neurological disease require further investigation.

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How Could Gut Bacteria Affect the Brain?

The digestive system and brain communicate through a complex biological network known as the gut-brain axis.

This communication involves several pathways, including the nervous system, immune system, hormones, and chemical compounds produced by intestinal microorganisms.

One important communication route is the vagus nerve, which connects the brainstem with organs including the digestive tract.

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Researchers are investigating whether changes in gut bacteria may influence Parkinson's disease through several mechanisms.

1. Reduced production of beneficial bacterial metabolites

Certain gut bacteria produce short-chain fatty acids when they ferment dietary fiber.

These compounds, including butyrate, help support intestinal cells and contribute to normal immune and inflammatory regulation.

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The Japanese study found reduced concentrations of short-chain fatty acids and polyamines in stool samples from people with Parkinson's disease.

2. Changes in the intestinal mucus barrier

The intestine contains a protective mucus layer that helps separate microorganisms from the cells lining the gut.

Researchers proposed that reductions in certain beneficial bacterial metabolites could weaken this protective environment.

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However, this mechanism remains a hypothesis requiring further experimental confirmation.

3. Possible effects on inflammation

Changes in intestinal microorganisms may influence immune signaling and inflammatory processes.

Scientists are investigating whether intestinal inflammation could contribute to neurological changes associated with Parkinson’s disease.

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4. The role of alpha-synuclein

Alpha-synuclein is a protein normally found in nerve cells.

In Parkinson’s disease, abnormal alpha-synuclein aggregates accumulate in parts of the nervous system.

Some research suggests that disease-related alpha-synuclein changes may involve the intestinal nervous system and could potentially influence the brain through connected biological pathways.

However, not all cases of Parkinson’s disease necessarily begin in the gut.

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Scientists are still debating the sequence and mechanisms of these changes.

Could Vitamin B2 and B7 Become a New Parkinson’s Treatment?

This is where the research becomes especially interesting.

Because the study identified reduced bacterial pathways for producing riboflavin and biotin, the researchers suggested that restoring these nutrients could potentially provide therapeutic benefits in selected patients.

In principle, this might involve nutritional supplementation designed to compensate for particular microbiome-related disturbances.

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But there are important unanswered questions.

Researchers do not yet know whether supplemental B2 or B7 can reliably correct these microbial changes, improve Parkinson's symptoms, or slow neurodegeneration.

The 2024 research was an observational microbiome analysis, not a clinical trial of vitamin supplementation.

It therefore cannot establish that taking these vitamins treats Parkinson's disease.

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There is currently insufficient clinical evidence to recommend high-dose riboflavin or biotin as a disease-modifying treatment for Parkinson's disease.

People living with Parkinson's should continue prescribed medications and discuss nutritional concerns with their treating clinician.

New Research in 2026 Strengthens the Gut-Brain Connection

The story doesn't end with the original Japanese discovery.

In March 2026, researchers published another important study in npj Parkinson's Disease, examining whether specific intestinal bacteria could influence Parkinson's-related symptoms.

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They investigated a bacterium called Faecalibacterium prausnitzii, which is frequently found at lower levels in people with Parkinson's disease.

Using mice genetically engineered to develop Parkinson's-like abnormalities, the scientists discovered that administering this bacterium improved motor and gastrointestinal symptoms.

The treatment was also associated with reduced abnormal alpha-synuclein accumulation in the brain and changes in immune responses.

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These results provided experimental support for the possibility that certain gut bacteria contribute to disease-related processes.

However, the findings came from animal experiments.

Scientists have not established that administering this bacterium will produce the same effects in human patients.

Could changing the gut microbiome improve symptoms?

Other researchers have explored fecal microbiota transplantation, a procedure that transfers carefully screened intestinal microorganisms from a donor.

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A randomized phase 2 trial published in March 2026 examined repeated microbiota transplantation in people with newly diagnosed, previously untreated Parkinson’s disease.

Researchers reported improvements in motor symptoms, constipation, and certain quality-of-life measures over the study period.

These findings are encouraging, but the treatment remains experimental for Parkinson’s disease.

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A separate review published in May 2026 found that clinical results across transplantation studies were inconsistent, particularly regarding movement symptoms.

More extensive trials are needed before microbiome transplantation can be recommended as routine Parkinson’s treatment.

Together, these investigations suggest that the gut microbiome is becoming an important target for neurological research.

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What About Probiotics and Prebiotics?

Probiotics contain living microorganisms that may provide health benefits when administered in adequate amounts.

Prebiotics are substances that certain beneficial gut microorganisms can use.

Both are being investigated for their potential role in digestive and neurological health.

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Some studies suggest that particular probiotic formulations may help alleviate constipation in people with Parkinson’s disease.

Prebiotic interventions may also influence bacterial fermentation and the production of beneficial metabolites.

For example, a small 2025 pilot study investigated a fiber-rich dietary intervention combined with lactulose.

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Researchers observed changes in gut bacterial composition and metabolites, along with improvements in some gastrointestinal symptoms.

However, no commercially available probiotic or prebiotic has been proven to cure Parkinson’s disease or reliably stop its progression.

Different bacterial strains have different effects, so results from one probiotic cannot automatically be applied to another.

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7 Practical Ways to Support Gut Health

While scientists investigate the relationship between gut bacteria and Parkinson’s disease, there are several evidence-informed habits that can support general digestive health.

These practices should not be considered treatments or proven prevention strategies for Parkinson’s.

1. Eat a variety of fiber-rich plant foods

Vegetables, fruits, whole grains, beans, lentils, nuts, and seeds provide different forms of dietary fiber.

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Gut microorganisms ferment certain fibers, producing metabolites involved in intestinal health.

Increase fiber gradually, particularly if you experience bloating or constipation.

2. Include foods containing vitamin B2

Mushrooms, almonds, eggs, yogurt, and fortified foods can contribute riboflavin to the diet.

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A varied diet generally provides sufficient riboflavin for most healthy adults.

3. Get adequate vitamin B7

Biotin occurs naturally in foods such as cooked eggs, legumes, seeds, nuts, and sweet potatoes.

Deficiency is uncommon in people eating a varied diet.

High-dose biotin supplements should not be started specifically to treat Parkinson’s disease without medical guidance. Large supplemental doses can also interfere with certain laboratory tests.

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4. Consider fermented foods

Foods such as yogurt with live cultures, kefir, and fermented vegetables may contribute microorganisms or fermentation-related compounds to the diet.

Their effects vary depending on the product and individual.

Fermented foods are not interchangeable with clinically tested probiotic treatments.

5. Stay physically active

Regular physical activity supports digestive motility, cardiovascular health, and overall well-being.

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For people with Parkinson’s disease, appropriately supervised exercise may also help maintain mobility, balance, and functional independence.

6. Address chronic constipation

Constipation is common in Parkinson’s disease and may substantially affect quality of life.

Adequate hydration, suitable dietary fiber, physical activity, and individualized medical treatment can help.

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Persistent constipation should be evaluated, particularly when accompanied by abdominal pain, bleeding, vomiting, or unexplained weight loss.

7. Discuss digestive symptoms with your doctor

Changes in bowel habits may have many explanations.

Although gastrointestinal symptoms can precede Parkinson's disease, most people experiencing constipation do not develop the disorder.

A qualified healthcare professional can investigate persistent symptoms and recommend appropriate care.

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Does Parkinson's Disease Really Begin in the Gut?

This remains one of the most fascinating unanswered questions in neuroscience.

Some researchers support the possibility that certain forms of Parkinson's disease may begin with abnormal biological processes in the peripheral nervous system, including the gastrointestinal tract.

Others suggest that the disease may originate primarily in the brain in different groups of patients.

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This has contributed to discussion of possible gut-first and brain-first pathways.

The two possibilities are not necessarily mutually exclusive.

Parkinson's disease is biologically complex, and multiple pathways may contribute to its development.

Genetics, aging, environmental exposures, inflammatory processes, and other factors are also under investigation.

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It would therefore be premature to conclude that intestinal bacteria are the sole cause of Parkinson's disease.

Nevertheless, the growing evidence suggests they may influence important aspects of the condition.

Why This Discovery Matters

Parkinson's disease currently has no established cure.

Existing medications, including levodopa, can significantly improve symptoms, while physical therapy, exercise, and other treatments help many people maintain function and quality of life.

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However, scientists continue searching for therapies capable of modifying the underlying disease process.

The Japanese microbiome findings offer a potentially important research direction because they identify biological pathways that might be influenced through nutrition or microbial interventions.

Compared with developing entirely new pharmaceutical compounds, investigating existing nutrients and naturally occurring microorganisms may provide practical opportunities for research.

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But promising biological mechanisms do not automatically translate into effective treatments.

Carefully designed clinical trials will be essential to determine whether modifying microbial vitamin production or restoring specific gut bacteria produces meaningful neurological benefits.

Final Thoughts: Could the Next Parkinson's Breakthrough Start in the Gut?

The connection between Parkinson's disease and intestinal bacteria is becoming increasingly difficult to ignore.

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Researchers have identified differences in gut microbial populations, reduced bacterial pathways involved in vitamin B2 and B7 production, and alterations in compounds that help maintain

intestinal health.

Additional studies in 2026 have provided experimental and early clinical evidence that changing the gut microbiome may influence certain Parkinson's-related symptoms.

These discoveries are promising.

But they do not establish that Parkinson's disease can be cured with vitamins, probiotics, or dietary changes.

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The most important breakthrough is not the discovery of a simple cure. It is the growing recognition that understanding the gut may reveal entirely new ways to investigate and potentially treat a complex brain disorder.

Future research may help scientists identify which patients could benefit from microbiome-targeted treatments and how to make those approaches safe and effective.

For now, supporting digestive health through balanced nutrition, appropriate exercise, and individualized medical care remains a sensible approach to overall well-being.

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And the possibility that tiny intestinal microorganisms could influence one of the world's most challenging neurological diseases reminds us how much there is still to discover about the human body.

What do you think? Could the future of Parkinson's treatment involve restoring beneficial gut bacteria rather than focusing exclusively on the brain? Share your thoughts in the comments.

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