



# Research Summary: Fibromyalgia #1

As featured in Dr. Kenny Mittelstadt's video:  
"What is Fibromyalgia? Understand Your Root Causes..."  
Date of Publication: 11/29/2025

## Research Context:

This week's topic explores how fibromyalgia isn't just about managing pain. It's about understanding how four interconnected body systems create a pattern that keeps you stuck.

The research below helps connect the dots between what you feel in your body and what's actually happening at the cellular level, showing why conventional approaches that only look at one layer might be missing the bigger picture

## Key Findings from the Research:

### Study 1 (PMID 38878832):

Researchers used an animal model to examine what's happening inside the mitochondria (your cells' energy factories) in fibromyalgia. They found critical dysfunction in how mitochondria produce energy, particularly in the brain and spinal cord. This mitochondrial breakdown leads to increased neuroinflammation (inflammation in the nervous system) and impaired neuronal plasticity (your brain's ability to regulate pain signals). When they supported mitochondrial function, pain behaviors decreased and the brain's inflammatory response calmed down. This confirms that the exhaustion in fibromyalgia isn't in your head. It's a real cellular energy crisis in the nervous system that directly affects how pain is processed and amplified.

### Study 2 (PMID 40582925):

This comprehensive review of 34 recent studies examined fibromyalgia's mechanisms and treatment approaches from 2020 to 2025. The review confirmed that fibromyalgia involves central sensitization (when your nervous system amplifies pain signals) and neuroinflammation as core mechanisms. Importantly, multidisciplinary approaches addressing pain, fatigue, sleep quality, and emotional health together showed significantly better outcomes than single interventions alone. Studies using myofascial techniques, resistance exercise, and stress-reducing therapies showed measurable improvements in sleep quality. The key finding is that fibromyalgia involves multiple body systems simultaneously, which is why treating just one aspect often fails. The condition requires a comprehensive approach that addresses the interconnected loop of stress, energy, inflammation, and nervous system sensitivity.

### Study 3 (PMID 36290691):

This review examined Coenzyme Q10 (CoQ10), a crucial nutrient for mitochondrial energy production, in managing fibromyalgia. The review analyzed 15 years of research and found consistent evidence linking fibromyalgia to oxidative stress and mitochondrial dysfunction. CoQ10 plays a key role in how your mitochondria create ATP (cellular energy). People with fibromyalgia often show lower CoQ10 levels and higher oxidative stress markers. When CoQ10 levels are supported through supplementation, studies showed improvements in fatigue levels, pain scores, and overall quality of life. This reinforces that the exhaustion in fibromyalgia has a measurable biochemical basis. Your cells literally can't produce enough energy to meet your body's demands, and this energy debt affects everything from muscle function to how your brain processes pain signals.



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## Functional Medicine Connections:

Here's how these pieces fit together: Fibromyalgia involves a loop where four systems amplify each other. Your stress axis gets stuck "on," flooding your body with stress chemistry that damages your mitochondria and reduces energy production.

This low-energy, high-stress environment activates your brain's immune cells (microglia), creating neuroinflammation that amplifies pain signals.

Underneath all of this is your gut, where chronic stress and inflammation shift your microbiome and activate your immune system.

This gut-based inflammation feeds back into the neuroinflammation and stress chemistry, completing the loop. Each system makes the others worse.

## Practical Reflections & Takeaways:

Think about your timeline: When did your symptoms intensify? Was there high stress, an infection, a major life change, or sleep disruption before your diagnosis? These are clues about which systems fell first.

Consider your patterns: Does pain worsen when you're stressed? Do you crash after normal activities? Does brain fog lift on better sleep days?

These observations show you how your stress axis, energy production, and nervous system sensitivity are connected.

Your lived experience isn't imaginary. It's your body showing you where the communication networks have broken down and need strategic support.

## Want Dr. Kenny's Eyes on Your Case?

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