



# Shaping the future of neurodegenerative diagnostics

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Innovation at the speed of life.





## Introduction

# Embracing important questions for neurodegenerative diagnostics

For too long, a dark cloud has hung over the prospect of living a long life. Dementia, a broad category of neurodegenerative diseases, affects memory, thinking and other crucial aspects of brain function. Over time, individuals in the grips of dementia lose their memories and their ability to care for themselves, while their families watch helplessly.

The scientific community has been working for decades to find answers and solutions for dementia patients. While scientific progress has no set roadmap, their perseverance has finally begun to pay off. With the recent approvals of disease-modifying treatments (DMTs) for Alzheimer's disease, we have been propelled into a new era where we can better treat deteriorating mental function. But our work is not done yet.

Modern medicine continues to extend the global life expectancy, and the burden of chronic neurodegenerative disease is expected to double in the next two decades. We must expand on these early advancements with an eye toward what clinicians will require in the coming years — timely and effective treatments for the ever-growing population of people who will need them.

[Danaher](#) is committed to doing our part to advance high-quality neurodegenerative care. And we know these breakthroughs will be built on collaboration. Our team is focused on providing the expertise and platforms essential to enhancing our ability to detect and monitor diseases of the central nervous system via key biomarkers.

Through these efforts, we can help healthcare providers treat the right patient with the right medicine in the right dose at the right time.

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### **Innovation comes with many unknowns, and neurodegenerative diagnostics are no exception.**

- 1** How can we democratize neurodegenerative diagnostics to ensure access for the millions of aging patients who will need them?
  - 2** How can we ensure we identify as many real cases as possible, without over diagnosing patients?
  - 3** Which biomarker combination will allow us to monitor disease progression and assist in the development of effective therapies?
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Each of these questions presents unique challenges, but by uniting the right minds and technologies, we can find bold solutions that accelerate progress. Together, we can turn decades of perseverance into a new model of neurodiagnostic care and provide hope for patients across the globe.



## Quantifying patient needs

# Neurodegenerative diagnostics: an opportunity for innovative improvements

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**10** Million

new dementia cases every year.<sup>1</sup>

**2x**

The burden of chronic neurodegenerative conditions is expected to double over the next 20 years.<sup>2</sup>

**\$1.3** Trillion

spent globally on dementia care.<sup>1</sup>

# Ensuring equitable access to diagnostic care

## A difficult challenge

The path to an official dementia diagnosis can be long and winding. It can take multiple doctor visits over long stretches of time to recognize abnormal behaviors and cognitive symptoms resulting from dementia, which can be expensive and distressing. For some, structural barriers that limit access to quality care can delay diagnosis even further. Ultimately, many patients don't receive a diagnosis until they have already deteriorated significantly.

Many of the roadblocks associated with neurodegenerative disease [diagnostics](#) tie back to the current standards of care. Diagnosis currently relies on testing, such as lumbar punctures and PET scans, that requires specialized equipment only available in limited locations. Furthermore, the administration and interpretation of these tests rely on specialty staff, like neurologists, who are in short supply worldwide.<sup>3</sup>

The uncertainty surrounding undiagnosed cognitive decline can be incredibly disruptive and stressful. Without clear insights, patients and their families may struggle to plan for the future, and healthcare teams can have difficulty assigning effective interventions. Lowering barriers to diagnostic access is, therefore, a crucial concern that needs a solution.

## A way forward

Fortunately, blood-based biomarkers are helping us reshape the diagnostic landscape. Protein biomarkers change as brain function worsens and can signal to healthcare teams that an abnormal condition or disease is present or developing. Unlike the more invasive procedures of lumbar

punctures and brain scans, blood-based neurodegenerative tests are more patient friendly and accessible. It's possible these tests could be used in specialty clinics and secondary care facilities to help reduce the burden on neurologists and other providers. With further development, these tests could even allow primary care teams to screen asymptomatic patients, shifting the standard of care for individuals with an elevated risk of developing dementia.

This vision for neurodegenerative diagnostics is already tangible. Recently, a Danaher Beacon research team based in the lab of primary investigator Carlos Cruchaga, PhD, at Washington University School of Medicine completed a large-scale plasma proteomics profiling study identifying a range of potential additional biomarkers for Alzheimer's disease.<sup>4,5,6</sup> [Danaher](#) is also studying how these novel biomarkers behave in special clinical situations, such as patients with comorbidities, patients receiving DMTs, and patients who initially received an unclear diagnosis. As we build biomarker profiles, predictive algorithms and artificial intelligence (AI) will help us develop an intimate understanding of biomarker molecular structures, providing additional clarity.

When we combine all the pieces, we can design tests that appropriately detect these disease-related proteins for the right clinical use cases. Together, we're shaping a future where precision in care, earlier detection and smarter decision-making diagnostics work in tandem with evolving targeted therapies to redefine what's possible in patient care.

3. Burton A. How do we fix the shortage of neurologists? *Lancet Neurol.* 2018;17(6):502-503. [doi:10.1016/S1474-4422\(18\)30143-1](https://doi.org/10.1016/S1474-4422(18)30143-1)

4. Heo G, Xu Y, Wang E, et al. Large-scale plasma proteomic profiling unveils diagnostic biomarkers and pathways for Alzheimer's disease. *Nat Aging.* 2025;5(6):1114-1131.

[doi:10.1038/s43587-025-00872-8](https://doi.org/10.1038/s43587-025-00872-8)

5. Sharpening our diagnostic toolkit for Alzheimer's | Danaher. Accessed June 24, 2025. <https://www.danaher.com/sharpening-our-diagnostic-toolkit-alzheimers>

6. <https://www.danaher.com/danaher-beacons>

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**Innovation requires commitment and an understanding that there are more questions than answers. The right question moves you forward and creates interest among scientists. The pioneers in this space aren't worried about questions — they seek them out.”**

**Nicole Selenko-Gebauer MD, MBA**

Group Vice President & Chief Innovation Officer, Danaher Diagnostics

## Diagnostic excellence

# Creating clarity from the start

## Promoting confidence in results

Improving access is just one area of diagnostic innovation. Accuracy, sensitivity and precision are essential to transforming clinical decision-making. While blood-based biomarkers introduce the possibility of screening patients for neurodegenerative diseases before clinical symptoms appear, it's crucial that unclear results and false positives be limited to the highest degree possible.

Inconclusive and inaccurate diagnoses can snowball into multiple rounds of secondary testing and unnecessary treatments. Navigating this uncertainty can cost patients and healthcare systems time and money, while inflicting a significant emotional burden. If tests are to meet the demands of clinical situations, therapeutic options must continue to evolve, offering patients interventions with beneficial risk-benefit profiles for long-term treatment. In other words, we must strive for excellence in precision to provide clear and accurate, directive answers.

We can start by recognizing that, at a fundamental level, decisions in medicine are based on pattern recognition. Many signals need to be examined and considered when diagnosing a neurodegenerative disease — some caused by the disease, some by comorbidities, previous therapies and general health. This is an opportunity where the combination of technology and diagnostic expertise can push us beyond today's standards. AI models excel at organizing data and recognizing patterns. Used wisely, AI has the potential to be a partner in the development of tools capable of analyzing patient symptoms, biomarker levels, demographics and more.



Equipped with these insights, physicians will be in a better position to consider the totality of a patient's profile and make smart, personalized decisions.

Powering diagnostics with AI and carefully developing selective biomarkers will help us bring clarity and direction to complexity. With neurodegenerative diagnostics that provide both specificity and sensitivity, we can do more than give a patient a clear diagnosis. We can increase the chance that DMTs will be implemented before serious neurological damage occurs — improving outcomes and health.

## Maximizing efficacy

# Diagnostics that promote better therapies

## Strategizing for future innovations

The next generation of therapies for neurodegenerative diseases are on their way. To prepare for their arrival, we will need tools that allow us to go beyond binary detection. Tests that enable rapid, noninvasive assessments of disease progression will improve our understanding of diseases, enhance the robustness of clinical studies in neurodegenerative medicine and give us a better roadmap to more powerful interventions.

By designing diagnostic tools that measure disease activity, both physicians and patients will have additional insight into a therapy's impact. In practice, biomarkers could become proxy targets measuring a patient's response to a therapy. For those living with dementia, this can provide the reassurance needed to continue adhering to DMTs, even when benefits appear gradually and are difficult to notice. For healthcare teams, insights into disease activity can help assess new treatments as they become available and assist in creating personalized and precise approaches to optimize patient care.

Moving this research into real-world applications presents unique challenges along with new opportunities for innovation. In practice, blood biomarkers used to measure disease activity or responses to therapy may be distinct from the biomarkers used to achieve an early diagnosis. To ensure that both breakthroughs reach patients, we need highly sensitive and precise technology that can scale up for real-world impact.

Immunoassay analyzers are one of these technologies. For example, the [Dxl 9000 Immunoassay Analyzer](#), developed by [Beckman Coulter Diagnostics](#), is a powerful tool for detecting a wide array of proteins and molecular structures.<sup>7</sup> Immunoassay analyzers like these are also adaptable enough to accommodate new biomarker discoveries and are affordable, easily automated for large-scale operations and a familiar tool in clinical labs, minimizing the need for additional training. With this technology in hand, the industry will be primed to put new biomarker breakthroughs into practice.

## Meeting the moment

As the global population continues to age, the demand for neurodegenerative diagnostics and care will continue to grow. Danaher is dedicated to meeting this moment, joining companies, hospitals and research teams around the world to address the most critical needs in the neurodiagnostic field and, ultimately, help people live longer, happier lives.

We stand with those charting new paths in diagnostics — equipping them with the tools, data and global reach needed to ensure quality care is accessible to all. By designing sensitive and accurate blood-based diagnostics, we hope to help physicians detect diseases earlier, monitor treatment better and improve the patient experience across the board.

**We're proud to be a part of the scientific team committed to a healthier world.**

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