BostonGene

# 2025 TECHNOLOGY INNOVATION LEADER

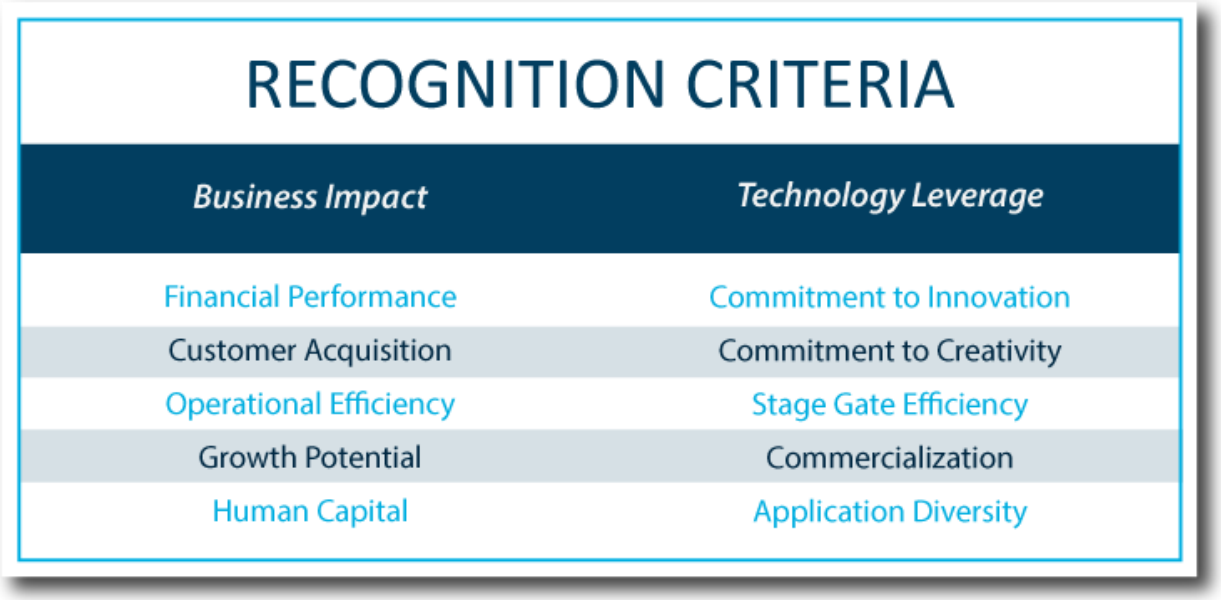
*Enhancing Customer Impact Through Powerful Technology Integration*

*RECOGNIZED FOR BEST PRACTICES IN THE GLOBAL AI-DRIVEN PRECISION ONCOLOGY SOLUTIONS INDUSTRY*

FROST & SULLIVAN

## Best Practices Criteria for World-class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each recognition category before determining the final recognition recipient. The process involves a detailed evaluation of the best practices criteria across two dimensions for each nominated company. BostonGene excels in many of the criteria in the AI-driven precision oncology solutions space.




### Reshaping the Future of Oncology through AI-powered Insights

Precision oncology is transforming cancer treatment by tailoring therapies to the genetic and molecular profiles of individual tumors, offering more effective and personalized care. The market is experiencing significant growth globally, fueled by multiple factors.

One of the most significant growth drivers is increasing awareness and accessibility in developed markets. Initiatives like the European Society for Medical Oncology Scale for Clinical Actionability of Molecular Targets framework and national funding programs for biomarker testing are enhancing genomic literacy and encouraging adoption.[1] Improved reimbursement policies and healthcare infrastructure further support the integration of precision oncology in clinical practice.

In emerging markets, rising awareness of early cancer detection expands the use of personalized therapeutics. Collaborations between diagnostics companies and public and private sectors are improving access to molecular testing through decentralized trials, private laboratory partnerships, and insurance coverage. These efforts help overcome geographic and resource limitations and promote equitable access to precision medicine.

Innovative research and development (R&D) also drive market growth. Investments in artificial intelligence (AI)-driven analysis of tumor multi-omics data and advancements in high-throughput sequencing technologies accelerate personalized treatment discovery. Additionally, initiatives such as the

[1] *Global Precision Oncology Market – Trends and Growth Opportunities* (Frost & Sullivan, November 2023)

Multi-omic Spatial Atlas in Cancer project are advancing tumor characterization through spatial omics technologies.[2]

Targeted therapy approvals are increasing due to expanded drug portfolios and novel clinical trial designs focusing on biomarker-driven patient selection. Moreover, government funding programs, including the United States (US) Cancer Moonshot and the European Union's clinical trial networks, provide critical financial support and regulatory incentives.[3]

Despite these positive trends, challenges remain. Limited adoption of molecular testing due to skill shortages and insufficient infrastructure restricts patient access to precision therapies. Geographic disparities and insurance coverage issues hinder treatment availability further, especially in low- and middle-income countries. Tumor heterogeneity and resistance mechanisms cause some patients to respond poorly to targeted therapies. Additionally, barriers to clinical trial participation, such as delayed testing results and financial burdens, slow progress.

Enhancing genomic literacy through tailored education and implementing virtual specialist support models is essential to overcoming expertise gaps. Public-private partnerships and multi-stakeholder collaborations also play a crucial role in expanding the reach of precision oncology.

Despite these challenges, Frost & Sullivan expects ongoing technological innovation, policy support, and collaboration to sustain robust growth in the precision oncology market, enabling more personalized and effective cancer care globally.

In this context, companies must offer revolutionary capabilities to address market gaps and clinical complexity. BostonGene Corporation (BostonGene) exemplifies this approach by leveraging a proprietary AI-driven platform that delivers rapid, precise insights into tumor biology and treatment response within a laboratory certified under the Clinical Laboratory Improvement Amendments, accredited by the College of American Pathologists, and approved by the New York State Department of Health.[4]

Recognized for its groundbreaking contributions to precision oncology through its comprehensive suite of molecular and immune profiling services, including the Tumor Portrait Test™, Liquid Biopsy, and Spatial Proteomics, BostonGene integrates multi-omics data to guide personalized therapy and streamlines investigation processes for biopharmaceutical (biopharma) partners.

Frost & Sullivan applauds BostonGene for advancing individualized cancer care and accelerating the development of targeted treatments, delivering innovative solutions that enhance diagnostic accuracy, inform treatment decisions, and improve patient outcomes.

## BostonGene: Unmatched Scalability, Enhanced Capabilities

BostonGene's competitive edge stems from its unmatched ability to unify advanced bioinformatics, AI, and laboratory innovation into a single, integrated platform that transforms cancer care and drug development. Unlike competitors focused on single data types or narrow applications, the company's

[2] Ibid.

[3] Ibid.

[4] https://bostongene.com/news-and-publications/documents

platform decodes the full biological complexity of cancer, generating clinically actionable insights that drive individualized treatment and biopharma strategy.

At the core of BostonGene's value proposition is its AI-powered software platform, which integrates next-generation sequencing, digital pathology, flow cytometry, and spatial profiling technologies. The system harmonizes and analyzes multi-modal data (genomic, transcriptomic, proteomic, immunologic, imaging, and clinical), providing a comprehensive molecular and cellular understanding of the tumor and its environment. This capability allows the company to simulate disease progression, predict patient response, and guide therapeutic development with a level of precision and context that traditional approaches cannot match.

BostonGene's platform operates across four biological levels.[5]

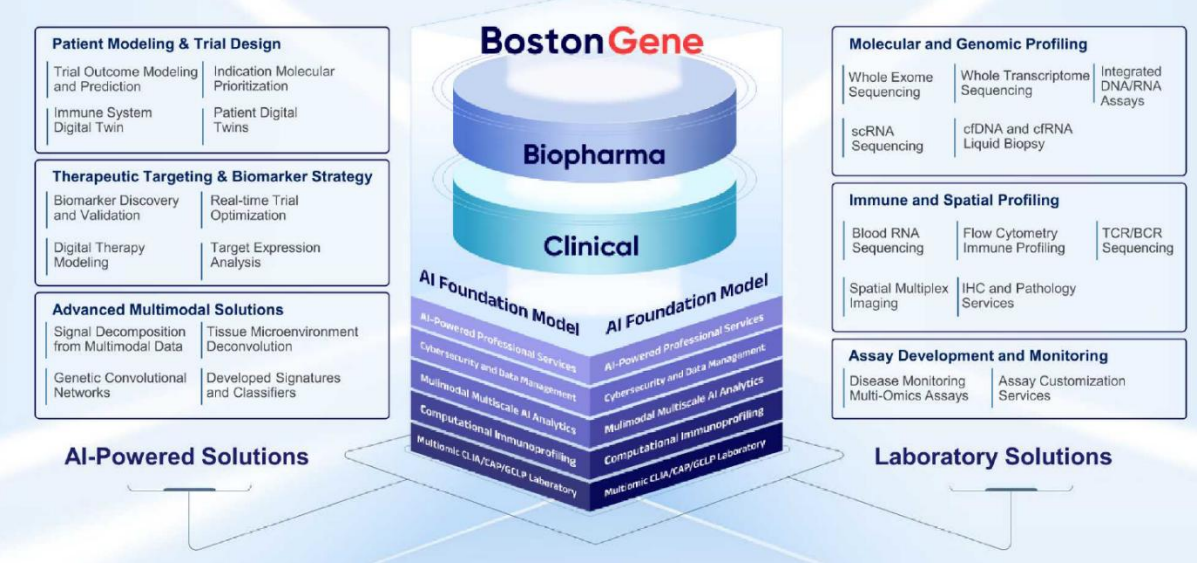
- **Molecular**: analyzing the underlying genetic, transcriptomic, and proteomic drivers of disease.
- **Cellular**: measuring signaling pathway activity and the functional makeup of the tumor microenvironment.
- **Tissue-profiling:** tissue-profiling spatial tissue architecture and cell-cell interactions.
- **Organism**: assessing systemic immune response dynamics to map the tumor's relationship with the host.

BostonGene generates these insights using a suite of cutting-edge laboratory capabilities, including whole-exome and transcriptome sequencing, single-cell ribonucleic acid (RNA) sequencing, digital RNA cytometry, liquid biopsy analysis (circulating tumor DNA, cell-free RNA), flow cytometry, spatial proteomics, and digital pathology.[6] The platform's ability to integrate these layers into a unified model enables highly personalized treatment recommendations and increases the predictive value of diagnostics for drug development.

This end-to-end data integration empowers BostonGene to drive measurable impact across the entire drug development lifecycle. In preclinical research, the platform supports the identification of mechanisms of action, bioactivity prediction, biomarker strategy, and target population definition. During clinical trials, it enables more precise patient stratification, early signal detection, smarter trial design, and real-time quality assurance, enhancing therapeutic efficacy and increasing the odds of regulatory success. In later stages, the company supports drug repurposing, population expansion, and efficacy diagnostics, creating opportunities for revenue growth and accelerated time-to-market.

[5] https://bostongene.com/technology

[6] Ibid.




*Source: BostonGene*

Efficiency and scalability strengthen BostonGene's position further. Over the past year, the company achieved nearly one-third of the reduction in clinical report generation costs by optimizing its wet and dry lab operations. BostonGene also adopts Good Clinical Practice standards, ensuring all results are validatable and audit-ready, which is critical for pharmaceutical (pharma) partners and regulatory bodies.[7] At the same time, the company's proprietary generative AI models fill gaps in incomplete datasets by recreating missing morphologic or RNA data. This process allows biopharma clients to move forward with confidence, even when early-stage data is limited.

For example, in a recent case involving advanced prostate cancer, BostonGene's Tumor Portrait test revealed a combination of biomarkers, including high programmed death-ligand 1 (PD-L1), microsatellite instability, and high tumor mutational burden, suggesting potential responsiveness to immunotherapy. Guided by these findings, the clinical team-initiated immunotherapy, resulting in a 90% drop in prostate-specific antigen levels and significant tumor reduction within three months.[8]

In another case, an elderly patient with advanced triple-negative breast cancer was identified via standard immunohistochemistry (IHC) and was ruled out for immunotherapy due to low PD-L1 levels. With limited options and concerns about chemotherapy side effects, the patient declined further treatment. Years later, BostonGene's Tumor Portrait test revealed high PD-L1 expression through a comprehensive molecular and immunologic analysis, an insight missed by the original IHC. A follow-up test confirmed the result, enabling the initiation of targeted immunotherapy. Within three months, imaging showed tumor shrinkage and reduced metastases, demonstrating the impact of a more holistic, AI-driven diagnostic approach.[9]

These cases exemplify how BostonGene's integrative AI-driven approach enables more accurate patient stratification and timely intervention. By uncovering molecular and immune features invisible to

[7] BostonGene Presentation Deck

[8] https://bostongene.com/patients/meet-our-patients/kenji

[9] Ibid.

conventional diagnostics, the company empowers oncologists to tailor therapies with greater precision, ultimately improving outcomes and expanding access to life-saving treatments.

BostonGene's differentiated approach is not theoretical; it delivers real, quantifiable results. The company collaborates with emerging biotechnology (biotech) firms and global pharma leaders to shape go-to-market strategies, identify responsive patient populations, and guide indication prioritization. In one case, BostonGene helped a small biotech company validate a biomarker strategy and design a Phase I study, ultimately supporting its acquisition by a major pharma company. In another, its collaboration with AstraZeneca and MD Anderson produced a new assay for small cell lung cancer, now used in a national study and is on track to become a standard of care.

BostonGene is also leading major collaborations aimed at redefining precision medicine. A nationwide initiative, in association with the Parker Institute for Cancer Immunotherapy, is developing a machine learning-based immune system classifier using blood and immune data from thousands of patients. This tool optimizes patient selection for next-generation immunotherapies set to enter clinical trials in the next 12 to 24 months.[10]

> *"Unlike competitors focused on single data types or narrow applications, the company's platform decodes the full biological complexity of cancer, generating clinically actionable insights that drive individualized treatment and biopharma strategy."*
>
> ***- Silvana Rulet***
> ***Best Practices Research Analyst***

BostonGene's scientific leadership is well recognized with over 60 peer-reviewed publications in 2024,[11] including featured covers in Cancer Cell and Gastroenterology. The company's commercial success mirrors its scientific momentum: pharma revenue tripled in 2024, and projections for 2025 indicate potential sixfold growth.[12]

In a space as complex and dynamic as oncology, BostonGene offers clarity, precision, and speed. By transforming data into insight and insight into impact, the company is redefining the future of individualized cancer care and evidence-based drug development.

## Positioned for Growth

While precision oncology continues to gain traction, BostonGene recognizes that many biopharma organizations remain slow to adopt next-generation analytical platforms. The primary barrier is not regulatory complexity, as often assumed, but instead inertia within traditional development workflows. Many translational and clinical teams are accustomed to legacy methodologies and may not yet be fully aware of the value offered by integrated AI-powered platforms. As a result, the challenge lies in helping stakeholders see what's possible beyond their current practices.

BostonGene addresses this gap by reframing how it presents its technology, not simply as a diagnostic tool but as an interpretive platform that brings clarity to complex biological data. Rather than relying on raw molecular outputs, the company translates these findings into terms and patterns that align with how pharma teams understand disease mechanisms, highlighting inflammation, fibrosis, immunosuppression,

[10] Interview with Frost & Sullivan
[11] BostonGene Presentation Deck
[12] Interview with Frost & Sullivan

and other relevant biological signatures. This method allows scientists, clinicians, and decision-makers to grasp therapeutic implications more intuitively, accelerating the path from data to action.

To support this approach, BostonGene invests heavily in strengthening its commercial operations. Over the past year, the company brought in an entirely new commercial team with deep pharma experience, launched a market intelligence division, and revamped its communications strategy to better align with the needs and language of its stakeholders. The team designs these efforts to secure scientific buy-in and comprehensive alignment with product development, regulatory planning, and commercialization goals.

BostonGene's growth trajectory reinforces its market relevance. The company has raised approximately $300 million in funding and achieved a threefold increase in pharma in 2024.[13] While its workforce remains steady at 500 to 600, BostonGene strategically restructures its team to reflect a shift from early-stage R&D to commercial execution, marking a critical inflection point in its business evolution.

Geographically, BostonGene continues to expand beyond its US base. On the clinical side, it maintains active collaborations across South America, the Middle East, Turkey, Russia, China, and Japan. On the pharma side, its presence is growing across the US, Europe, and Japan, regions that anchor global R&D investment. This international footprint reflects the growing demand for integrated, AI-enabled molecular insights across a broad spectrum of healthcare systems and regulatory landscapes.

As it scales, BostonGene remains committed to operational efficiency and delivering measurable value. The company recently achieved a one-third reduction in clinical reporting costs through streamlined wet and dry lab operations. These improvements, along with the platform's demonstrated ability to inform drug development decisions, highlight BostonGene's dual strengths as a scientific innovator and a commercially agile partner.

Frost & Sullivan expects BostonGene to advance its competitive edge further by combining scientific innovation with commercial execution. Through its AI-powered interpretive platform and efficiency-driven operating model, the company accelerates the global adoption of precision oncology, enabling deeper partnerships, broader clinical impact, and sustained growth across key markets.

[13] Ibid.

## Conclusion

Technology integration is a critical success factor for the precision oncology industry. Yet, with many options available, market stakeholders need to leverage the most appropriate and best technology-based solutions to optimize their market impact. With its artificial intelligence (AI)-powered multi-modal platform, BostonGene Corporation (BostonGene) delivers clinically actionable insights that enhance therapeutic precision and accelerate every stage of drug development.

The company stands out from competitors based on its commitment to innovation, scientific rigor, and real-world impact. Its Tumor Portrait™ test integrates genomic, transcriptomic, proteomic, and immunologic data to generate a comprehensive view of the tumor and its microenvironment, enabling more accurate patient stratification, revealing hidden therapeutic opportunities, and informing the design of smarter, more targeted clinical trials.

The platform's flexibility allows it to support a range of stakeholders, from oncologists seeking tailored treatment strategies to pharmaceutical companies prioritizing indications, refining biomarker strategies, and accelerating time-to-market. Through these applications, BostonGene continues to shape the future of individualized cancer care and evidence-based drug development.

For its strong overall performance, BostonGene is presented with Frost & Sullivan's 2025 Global Technology Innovation Leadership Recognition in the AI-driven precision oncology solutions industry.

# What You Need to Know about the Technology Innovation Leadership Recognition

Frost & Sullivan's Technology Innovation Leadership Recognition is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

## Best Practices Recognition Analysis

For the Technology Innovation Leadership Recognition, Frost & Sullivan analysts independently evaluated the criteria listed below.

### Technology Leverage

**Commitment to Innovation:** Continuous emerging technology adoption and creation enables new product development and enhances product performance

**Commitment to Creativity:** Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

**Stage Gate Efficiency:** Technology adoption enhances the stage gate process for launching new products and solutions

**Commercialization:** Company displays a proven track record of taking new technologies to market with a high success rate

**Application Diversity:** Company develops and/or integrates technology that serves multiple applications and multiple environments

### Business Impact

**Financial Performance:** Strong overall business performance is achieved in terms of revenue, revenue growth, operating margin, and other key financial metrics

**Customer Acquisition:** Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

**Operational Efficiency:** Company staff performs assigned tasks productively, quickly, and to a high-quality standard

**Growth Potential:** Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

**Human Capital:** Leveraging innovative technology characterizes the company culture, which enhances employee morale and retention

## About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at http://www.frost.com.

### The Growth Pipeline Generator™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fueled by the Innovation Generator™.

Learn more.

***Key Impacts***:

- **Growth Pipeline:** *Continuous Flow of Growth Opportunities*
- **Growth Strategies:** *Proven Best Practices*
- **Innovation Culture:** *Optimized Customer Experience*
- **ROI & Margin:** *Implementation Excellence*
- **Transformational Growth:** *Industry Leadership*


### The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

***Analytical Perspectives***:

- Megatrend (MT)
- Business Model (BM)
- Technology (TE)
- Industries (IN)
- Customer (CU)
- Geographies (GE)