Application: 6065

Biomarker Discovery Platform

Page: General Information

Provide information about the company to be considered for the award. If you will be nominating an individual, specify the nominee's employer.

Name of Organization/Company

BostonGene

[redacted]

Additional Contacts

I do not wish to list additional contacts

Page: Entry Information

Entry Title

Biomarker Discovery Platform

Category

G03. Technical Innovation of the Year - Biotechnology

Technical Innovation of the Year Submission Format

Written Answers

a. Briefly describe the organization that achieved the nominated technical innovation: its history and past performance (up to 200 words). Required

BostonGene helps drug developers de-risk and accelerate research and development using a clinically validated AI platform purpose-built for oncology and supported by a CLIA-certified and CAP-accredited clinical laboratory. By integrating advanced molecular and immune profiling with clinical data, we uncover actionable insights that inform trial design, optimize patient selection and improve clinical outcomes. Our diagnostic and treatment recommendation solutions are used in clinical settings to personalize care and guide therapy decisions for patients.

BostonGene's AI-driven platform transforms oncology drug development by enabling precision biomarker discovery, patient stratification and identification of novel therapeutic targets. Our advanced analytics support smarter trial design, real-time adaptive strategies and faster decision-making. By deeply characterizing tumors, their microenvironments and the patient's immune system, we predict therapeutic response and identify potential adverse events, reducing trial risk and increasing the likelihood of regulatory success. Our integrated data capabilities provide deep insights into patient populations and treatment dynamics, guiding strategic drug development. BostonGene bridges the gap between discovery and delivery, empowering drug developers to accelerate innovation, personalize therapies at scale and redefine the future of cancer care.

b. Outline the nominated technical innovation. Be sure to describe it in terms that someone with limited knowledge of the technology can understand and appreciate (up to 250 words). Required

Drug development remains costly and slow, with only 3.4% of cancer drugs advancing from phase I trials to FDA approval. A biomarker-driven approach dramatically improves success rates and shortens timelines.

BostonGene's Biomarker Discovery Platform identifies molecular patterns that predict which patients will benefit from new therapies. Unlike traditional single-gene biomarkers that overlook tumor complexity, BostonGene's platform integrates AI-driven algorithms with multiomic data, including whole exome (WES) and transcriptome sequencing (WTS), liquid biopsy (ctDNA, cfRNA), flow cytometry and spatial proteomics. This comprehensive approach enhances patient selection, accelerates clinical development and improves trial success rates.

The platform works across diagnoses and therapies:

-Immunotherapy response prediction in solid tumors. Analysis of over 18,000 blood samples by two independent methods defined five immune system states predictive of treatment response. In head and neck cancer, BostonGene immunotypes outperformed conventional biomarkers like PD-L1 and tumor mutational burden.

-Targeted therapy in mantle cell lymphoma. BostonGene identified four tumor microenvironment (TME) subtypes via RNA-seq and WES. An immune-depleted subtype correlated with poor outcomes and resistance to Bruton's tyrosine kinase inhibitors (BTKi), informing personalized treatment strategies.

-TKI and ICI therapy in metastatic ccRCC. BostonGene's AI model generates individualized response scores from multiomic data, surpassing current biomarkers in predictive accuracy.

BostonGene transforms complex multiomic information into actionable insights, significantly reducing development timelines and improving patient outcomes.

c. Explain why the technical innovation you have highlighted is unique or significant (up to 250 words). Required

BostonGene's platform uniquely predicts therapy responses in cancer where traditional biomarkers have failed. In metastatic clear cell renal cell carcinoma (ccRCC), despite major advancements with immune checkpoint inhibitors (ICIs) and tyrosine kinase inhibitors (TKIs), standard predictors like tumor mutational burden (TMB), PD-L1 expression, CD8+ T cells and histology remain unreliable for selecting responders.

In direct comparison, BostonGene’s ICI and TKI response scores significantly outperformed existing biomarkers. Developed using an AI algorithm that integrates whole exome sequencing and RNA sequencing data, BostonGene’s ICI predictor was the only model consistently associated with clinical outcomes across all tested cohorts, whereas conventional metrics, including cytotoxic scores, immune-inflamed signatures, and PD-L1 expression, showed no significant predictive power. Similarly, the TKI response score exceeded the predictive ability of proliferation rates, angiogenesis signatures and macrophage-related biomarkers.

BostonGene’s achievement represents a major leap beyond current industry standards. It delivers a precise, AI-driven solution for therapy selection, enabling more effective and personalized cancer care, and improving outcomes where others have not succeeded.

d. Reference any attachments of supporting materials throughout this nomination and how they provide evidence of the claims you have made in this nomination (up to 250 words). Optional

BostonGene webpage highlighting analytical tools and methods used for biomarker discovery along with a case example https://bostongene.com/biopharma/biomarker-discovery

BostonGene publication on immunotherapy response prediction based on patients' immune system status identified through blood analysis https://www.cell.com/cancer-cell/fulltext/S1535-6108%2824%2900132-6

BostonGene publication on targeted therapy response prediction in mantle cell lymphoma based on tumor microenvironment subtyping https://www.nature.com/articles/s41408-023-00927-2

Press releases highlighting BostonGene's partnerships with leading research institutions and biopharma companies to discover novel response biomarkers across diverse indications:

- https://bostongene.com/news-and-publications/news/bostongene-announces-partnership-with-takeda-to-evaluate-immunotherapies-using-ai-powered-molecular-profiling

- https://bostongene.com/news-and-publications/news/bostongene-and-the-parker-institute-for-cancer-immunotherapy-collaborate-to-generate-comprehensive-longitudinal-multi-omic-data-for-predicting-immunotherapy-outcomes

- https://bostongene.com/news-and-publications/news/bostongene-and-saga-university-announce-collaboration-to-uncover-biomarkers-for-improved-immunotherapy-response-in-lung-cancer-patients

- https://bostongene.com/news-and-publications/news/bostongene-and-prisma-health-announce-collaboration-aimed-at-predicting-efficacy-of-immunotherapy-in-rare-cancers

- https://bostongene.com/news-and-publications/news/legochem-biosciences-selects-bostongene-as-genomic-partner-for-first-in-human-clinical-trial

- https://bostongene.com/news-and-publications/news/bostongene-announces-collaboration-to-evaluate-biomarkers-for-colorectal-cancer-and-multiple-myeloma-using-ai-driven-molecular-profiling-in-clinical-trials

- https://bostongene.com/news-and-publications/news/bostongene-collaborates-with-beigene-to-advance-biomarker-discovery-in-mantle-cell-lymphoma

Webpage Link

[REDACTED FOR PUBLICATION]

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Webpage Link 3

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Supporting Document

No File Uploaded

Would you like to add an additional supporting document?

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