

DNA SOFTWARE RECEIVES THE 2023 TECHNOLOGY INNOVATION LEADERSHIP AWARD

*Identified as best in class in the North American
multiplex PCR solutions industry*

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each Award category before determining the final Award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. DNA Software excels in many of the criteria in the multiplex polymerase chain reaction solutions space.

| AWARD CRITERIA | |
|----------------------------|------------------------|
| <i>Technology Leverage</i> | <i>Business Impact</i> |
| Commitment to Innovation | Financial Performance |
| Commitment to Creativity | Customer Acquisition |
| Stage Gate Efficiency | Operational Efficiency |
| Commercialization Success | Growth Potential |
| Application Diversity | Human Capital |

Multiplex Polymerase Chain Reaction: Market Overview

Pharmaceuticals and biotechnology companies consider polymerase chain reaction (PCR) the gold standard for modern diagnostics. Unlike conventional singleplex PCR, multiplex PCR simultaneously detects multiple targets in a single reaction well. As a result, Frost & Sullivan notes that its advantages include cost effectiveness, timesaving, higher throughput, increased data normalization accuracy, reduced pipetting errors, and deriving more information with a smaller sample.

However, multiplex panel designs must ensure accuracy to avoid false negatives. Technique limitations include insufficient models and knowledge regarding hybridization, suboptimal tools (design freeware), and advanced algorithms operating on inadequate information technology infrastructure. DNA Software™ (DNAS) uniquely leverages its expertise to meet customer needs. Frost & Sullivan analysts observe that the company is well-positioned to capitalize on new growth opportunities, cementing its position in the multiplex PCR solutions market.

A Commitment to Innovation and Creativity

Founded in 2000 and headquartered in Michigan, the United States (US), DNAS is a deoxyribonucleic acid (DNA) diagnostic design and analysis solutions provider. The company has helped hundreds of organizations overcome challenges and increased clients' time-to-market through its cutting-edge multiplex software. In 2019, Frost & Sullivan recognized DNAS for its multiplex software, reflecting cloud computing, modern algorithms, and a deep understanding of PCR mechanisms, and remains impressed

with the company's continuing innovation and recent offering of pre-validated PCR kits.

DNAS recognizes unmet client needs and ensures that it develops solutions truly meeting customer and market demands. Burgeoning from the renowned scientist Dr. John SantaLucia Junior's laboratory at Wayne State University, the company nurtures a research-focused culture propelling innovation. The team includes world-leading DNA and ribonucleic acid (RNA) biophysical chemistry experts who develop best-in-class algorithms for predicting hybridization and folding. As a result, DNAS' technology accelerates the discovery process from months to minutes - saving an impressive 80% of research and development-related resources.¹

Its software offerings include:

- **OMP-DE™**: The Oligonucleotide Modeling Platform is DNAS' programmable predictive modeling environment that forms the core of its product line. OMP encapsulates the company's chemical and biological data into a single design and simulation PCR script software platform.²
- **ThermoBLAST™**: Addresses primer specificity by scanning multiple primers against genome collections to find all hybridizations and amplicons. Unlike the traditional BLAST, it captures critical mishybridization hits through appropriate thermodynamic scoring based on complementarity as opposed to similarity, displaying all false amplicons, considering extensibility and stable mismatches, and allowing for solution conditions, buffers, salt, additives, and other experimental factors.³
- **CopyCount™**: A breakthrough in understanding quantitative (q) PCR, the product allows for the absolute quantifying of qPCR, eliminating the need for a standard curve, excessive replicates, or sample dilution. As a result, CopyCount saves time and money, generates easy-to-interpret results, and is compatible with existing qPCR instrumentation.⁴
- **Visual OMP™**: Desktop software for visualizing and simulating assay artifacts.⁵
- **PanelPlex™**: The multiplex PCR design software for cancer panels, anti-microbial resistance, and other applications has been rigorously validated for detecting diverse bacteria, viruses, and human targets. It saves an average of six to nine months of iterative experimental trial-and-error optimization, produces diagnostic quality designs and automated consensus designs of multiple variants of DNA or RNA targets, uses ThermoBLAST playlists to scan for off-target hybridizations, and scales the multiplex PCR assay design process.⁶
- **PanelPlex™-Consensus**: Rigorously validated for detecting more than 1,000 bacteria, viruses, and human targets with wet-lab-validated results, the consensus design for infectious diseases leverages cloud computing. It saves an average of at least six months of iterative experimental trial-and-error optimization, produces diagnostic quality designs and automated consensus designs of multiple variants of DNA or RNA targets, uses ThermoBLAST playlists to scan for off-target hybridizations, scales the multiplex PCR assay design process, and has a massive capability.⁷

¹ "Kits for Detection by PCR," (John SantaLucia Jnr. Presentation, 19 July 2022).

² DNA Software, "OMP-DE™," DNA Software, April 8, 2022, <https://www.dnasoftware.com/products/omp-de/>.

³ DNA Software, "ThermoBLAST™," DNA Software, April 8, 2022, <https://www.dnasoftware.com/products/thermoblast/>.

⁴ DNA Software, "Copycount™," DNA Software, April 19, 2022, <https://www.dnasoftware.com/products/copycount/>.

⁵ DNA Software, "Visual Omp™," DNA Software, April 8, 2022, <https://www.dnasoftware.com/products/visual-omp/>.

⁶ DNA Software, "Panelplex™," DNA Software, April 8, 2022, <https://www.dnasoftware.com/products/panelplex/>.

⁷ DNA Software, "Panelplex™-Consensus," DNA Software, April 8, 2022, <https://www.dnasoftware.com/products/panelplex-consensus/>.

DNAS has transformed its digital best-in-class multiplex software and what it considers “digital assets” into physical assets by offering pre-validated PCR kits. Currently, the company provides research use only kits for severe acute respiratory syndrome coronavirus 2 Omicron and Monkeypox virus to select Clinical Laboratory Improvement Amendments partners.⁸ DNAS has channel partners working to procure EUA approvals for its monkeypox and orthopox assay. Frost & Sullivan commends DNAS for its technology leverage, converting its digital offerings to physical ones.

A Proven Track Record

DNAS already has a proven track record by catering to more than 300 organizations worldwide (academia, agriculture, biotechnology, distributors, pharmaceutical industry, and government agencies) to address DNA diagnostic design and analysis obstacles. Recently, it has grown deeper relationships with two of the top four largest molecular diagnostic companies.⁹

The following customer feedbacks are testament to DNAS’ commercialization success:

“DNA Software has discovered the quantum nature of PCR ”

- *Director of R& D, **Qiagen**¹⁰*

“In my experience, DNA Software saved me 75% of my oligo[nucleotide] costs.”

- *Scientist II, **Roche Molecular Systems**¹¹*

“It is awesome! Every scientist or genome junky should have a copy”

- ***InSilixa (now Cepheid), CEO**¹²*

“DNA Software provides in 4 min. what used to take 4 months”

- ***Envirologix VP R&D**¹³*

“Visual OMP has best in world PCR design capability”

- ***Primer Design (Novacyt) CEO, UK**¹⁴*

“ CopyCount provided results 4X better than the delta Ct method.”

- ***MIT researcher***

Frost & Sullivan anticipates rapid, widespread technology adoption and further success with the company’s commercial launch of its multiplexed qPCR kits.

Positioned for Growth

With its customer-led strategy, DNAS consistently brings to market best-in-class products. At the same time, the company incorporates customer feedback into its product roadmap to maximize short-term

⁸ DNA Software, “PCR Kits,” DNA Software, 2022, <https://www.dnasoftware.com/products/pcr-kits/>.

⁹ Interview with DNA Software, 13 July 2022.

¹⁰ DNA Software, “Testimonials,” DNA Software, February 2, 2022, <https://www.dnasoftware.com/about/testimonials/>.

¹¹ DNA Software, “Testimonials,” DNA Software, February 2, 2022, <https://www.dnasoftware.com/about/testimonials/>.

¹² DNA Software, “Testimonials,” DNA Software, February 2, 2022, <https://www.dnasoftware.com/about/testimonials/>.

¹³ DNA Software, “Testimonials,” DNA Software, February 2, 2022, <https://www.dnasoftware.com/about/testimonials/>.

¹⁴ DNA Software, “Testimonials,” DNA Software, February 2, 2022, <https://www.dnasoftware.com/about/testimonials/>.

growth opportunities while providing a path to future revenues. Never losing sight of its clients' perspective, it has installed Atlassian Jira™ software that functions as a living and breathing ticket system, ensuring constant feedback and interactions and improved customer experience.

Moreover, in 2022, DNAS introduced NexPlex, a new subsidiary, to scale up kit manufacturing by partnering with oligo manufacturers as well as enzyme providers. The company and NexPlex are working towards a complete portfolio of superior performance (in terms of sensitivity, specificity, and detection

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*- Ojaswi Rana,
Best Practices Research Analyst*

limits) multiplex (five-plex, 25-plex, N-plex) assays for around 300 pathogens available for the lowest price in the space.¹⁵ It is rolling out NexPlex assays in a 510k FDA format in 2023.

Currently, DNAS is undergoing a financing round which will further bolster its efforts. Furthermore, one of its existing channel partners has a network of 80 distributors, which will immediately strengthen its global presence.¹⁶ From 2020 to 2021, the company recorded an incredible 65% revenue growth - and

expects its revenues to increase by at least another 50% in 2022.¹⁷ Given today’s landscape, Frost & Sullivan believes DNAS is in a prime position to increase its market share in this highly competitive multiplex PCR solutions industry, especially after launching its PCR kits commercially.

Conclusion

Technology is a critical success factor for the multiplex polymerase chain reaction (PCR) 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 solutions, DNA Software (DNAS) offers superior design software with deep insights into PCR mechanisms and multiplexed PCR assays. Frost & Sullivan applauds the way that DNAS stands out from other competitors based on its commitment to innovation and creativity while achieving commercial success. Having served more than 300 organizations across diverse sectors, the company is on its path to entering the PCR kit market, which will further boost its market position.

With its strong overall performance, DNA Software earns the 2023 Frost & Sullivan North American Technology Innovation Leadership Award in the multiplex PCR solutions industry.

¹⁵ “Kits for Detection by PCR,” (John SantaLucia Jnr. Presentation, 19 July 2022).

¹⁶ Interview with DNA Software, 13 July 2022.

¹⁷ Ibid.

What You Need to Know about the Technology Innovation Leadership Recognition

Frost & Sullivan's Technology Innovation Leadership Award recognizes the company that has introduced the best underlying technology for achieving remarkable product and customer success while driving future business value.

Best Practices Award Analysis

For the Technology Innovation Leadership Award, 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 Success: 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 financial performance is achieved in terms of revenues, 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: Commitment to quality and to customers characterize the company culture, which in turn 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 Engine™

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

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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:

- **Mega Trend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**

