FROST & SULLIVAN

Quris Technologies

2022 TECHNOLOGY INNOVATION LEADER

European AI-enabled Drug Safety Prediction 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. Quris Technologies Ltd. excels in many of the criteria in the artificial intelligence-enabled drug safety prediction technology space.

Urgent Need to Ascertain Drug Candidate's Safety Profile to Prevent Clinical Trial Failures

Pharmaceutical drug discovery and development suffer from declining success rates with new molecules. Frost & Sullivan finds that traditional solutions focusing on data from limited sources and rule-based computational techniques are inefficient. Understanding biological networks and drug-target interactions remain a daunting task. Also, predicting drug candidates' safety accurately in humans is challenging.

Artificial intelligence (AI) is transforming the drug discovery landscape. AI supports identifying and prioritizing disease-specific therapeutic targets based on gene-disease associations. Applying AI-based products and solutions enables the pharmaceutical industry to shorten discovery timelines and increase drug safety. Furthermore, AI-enabled solutions enhance process agility and improve drug pipeline diversification opportunities via a cost-effective model. [1]

However, several commercial AI-based technologies that use the easily accessible traditional pre-clinical data (lab, mice, and genomics) inadequately predict clinical safety, leading to clinical trial failures costing billions of dollars. Hence, it is critical for players to establish the right balance of data, AI, and computational competencies to remain competitive and develop better prediction capabilities. The application of AI in pharmaceutical industry is in its early growth phase and most of the companies in

[1] Frost Radar™: Artificial Intelligence-enabled Drug Discovery in the Global Pharmaceutical Industry, 2021, *(Frost & Sullivan, June 2021*)

the niche are focused on developing algorithms, platform, and validating the proof-of-concept.

Frost & Sullivan estimates AI-based solutions in the pharmaceutical industry market will reach over $2 billion in 2022, with a compound annual growth rate of nearly 22% from 2018 to 2022.[2]

AI products that enable novel targets and compounds discovery, improve clinical trial performance, and use Real World Evidence (RWE) constitute the predominant segment during the forecast period. Quris Technologies Ltd. (Quris) uniquely leverages its technology platform to meet its customers' needs. It is well-positioned to capitalize on new growth opportunities, cementing its leadership in the AI-enabled drug safety prediction technology.

Technology Sparked by a Commitment to Make an Impact

Founded in 2020 and headquartered in Boston and Tel Aviv, Israel, Quris is a provider of artificial intelligence (AI)-enabled safety prediction of new drug candidates. The company developed an innovative Bio-AI Clinical Prediction Platform to support drug development. Besides its pharma services of drug safety prediction, Quris has two additional business lines: developing its drug pipeline and providing personalized medicine services. A team of top scientists, technology experts, medical pioneers, and seasoned management professionals with a track record of seamless execution leads the company.

Backed by world-class subject matter experts, Quris is developing the first Bio-AI Clinical Prediction Platform over the last two years. The company refined its holistic approach to AI-enabled drug safety prediction, continuously building its technology to bridge industry gaps. The AI Chip-on-Chip platform technology leverages a patented process to test 1,000's of known safe and unsafe drugs on 1,000's of miniaturized Patients-on-a-Chip applying an automated, high-throughput system. At the same time, next-generation nano-sensors enable continuous response monitoring from each miniaturized organ to these drugs. The platform's ability to simulate a natural human body's reaction to novel molecules without solely relying on the inaccurate animal-testing stage is ground-breaking.

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>
> ***- Supriya Lala,***
> ***Best Practices Analyst***

Also, by holding the potential to limit dependence on animal testing, the technology contributes towards reducing animal cruelty during pre-clinical experimentation, thus revolutionizing the pharmaceutical industry. Furthermore, the continuously generated data trains the machine-learning (ML) classification algorithm further, which is highly predictive of clinical safety and discerns the toxicity level of the new drug candidate when tested.

[2] Growth Insight—Role of AI in the Pharmaceutical Industry, Global, 2018–2022, (Frost & Sullivan, September 2019)

Quris has an exclusive collaboration with the New York Stem Cell Foundation, enriching its platform's capabilities. It allows the Bio-AI Clinical Prediction Platform to leverage powerful AI to train the system on hundreds of stem cell-derived Patients-on-a-Chip, thus, representing a vast genomic diversity.

Multiple innovative companies are operating in the niche of AI in the drug discovery space, such as Exscientia, Immunai, Relay Therapeutics, Benevolent, and Insitro. Unlike other AI-pharma solutions that focus on drug discovery (screening, lead selection, optimization, and in-vitro testing) but do not predict safety, Quris creates its niche within the niche by offering a platform that better indicates which drug candidates will safely work in humans. Quris uses AI to predict a drug's safety, and hence its ability to succeed, particularly in Phase I trials, thus avoiding the high costs of failed clinical trials for pharmaceutical companies.

> *"Frost & Sullivan identifies Quris's platform as a groundbreaking, innovative technology. Its strong intellectual property portfolio (18 granted and pending patents) protect its pioneering technology, adding value relative to its growth potential, thus securing a competitive advantage."*
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> ***Best Practices Analyst***

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The company's platform scales to fit the intricacies of clinical prediction, requiring ML models to routinely run a vast number of biological Patients-on-a-Chip experiments for AI training. Unlike other organ-chip devices with limited ability to run millions of experiments, the Quris platform is highly scalable, enabling massive experiments to run cost-effectively and train the AI, thereby revolutionizing the market.

Commercial Success and Scalability

In addition to providing clinical prediction services to pharma companies, Quris is also expanding its drug pipeline. Its first AI-based Fragile-X drug is preparing for clinical testing in 2022. Currently, big pharma companies like Novartis and Roche are still facing key challenges in developing their drugs for Fragile-X Syndrome, an inherited cause of autism and cognitive impairment. Based on numerous top-tier peer-reviewed publications, the company's AI-based Fragile-X drug uniquely addresses the root cause with the potential to cure the disease altogether.

Additionally, the platform can scale up to 1,000 drugs across all therapeutics, notably oncology, rare disease, and the blood-brain barrier. With the potential to reduce dependence on animal testing, Quris's platform can eventually address the pharmaceutical companies' biggest challenge by avoiding the risks and billions of dollars of failed clinical trial costs.

As part of its business strategy, the company plans to grow through localization in the United States, European Union, United Arab Emirates, Japan, and Singapore. With its centralized intellectual property and technology, its hypergrowth strategy includes developing localized bio-AI centers, securing local grants, and utilizing regional marketing channels. It plans to harvest stem cell samples and provide personalized medicine services to interested patients through these centers.

"We are at the tipping point of modernization of drug discovery. I think the Quris platform could be of significant value to pharma companies and the health of society at large"[3]

-Dr. Robert S. Langer, Co-founder, Moderna, MIT Professor

Client Relationships Lead to Expansion Opportunities

The bulk of Quris's client relationships begins through industry collaborations and strategic partnerships. The company takes it as a testament to its game-changer technology that received laurels from several scientists and pharma companies worldwide. Apart from stem cell institutes and Israel-based universities, it partners with top-notch pharma companies. Recently, Quris signed a multimillion-dollar agreement with Merck KGaA (Merck). It allows the latter to evaluate the Bio-AI safety prediction platform, compare it to standard in-vitro and in-vivo techniques, and license the platform with usage rights for up to five years for a specific disease domain. Merck's initial evaluation covers identifying possible liver toxicity risks for drug candidates that pre-clinical experiments failed to recognize.

Quris demonstrates high-growth potential. The company is well-positioned in the market, with an industry-leading product that offers tremendous value and high demand in the pharmaceutical sector. It focuses on establishing improved proof-of-validation of its platform capabilities, creating strategic partnerships, growing its business lines, and scaling up as part of its futuristic growth strategy.

To support this effort, Quris raised close to $28 million in seed funding, including the initial $9 million announced in 2021 with the launch of its BioAI platform.[4] The company will use the funds to expedite its novel drug research, grow its team, and strengthen its partnerships.

[3] https://www.drugdiscoveryonline.com/doc/quris-closes-critical-drug-development-gaps-with-new-clinical-prediction-ai-platform-0001
[4] https://www.globenewswire.com/news-release/2022/01/11/2365224/0/en/Quris-Closes-28-Million-in-Seed-Funding-From-Top-Institutional-Investors.html

Conclusion

Technology is a critical success factor for the artificial intelligence (AI)-enabled drug safety prediction technology 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 AI Chip-on-Chip platform technology, Quris Technologies Ltd. (Quris) delivers the answers to pharmaceutical companies' most significant challenge, drug safety clinical trial failures. Quris enables them to test drug candidates on miniaturized Patients-on-a-Chip through an automated, high-throughput system. The platform continuously monitors miniaturized organs' drug responses. The data generated from the system self-trains the machine learning algorithm that predicts the safety of the new drug candidate on testing; hence, anticipating which drug candidates will safely work in humans.

Quris stands out from competitors based on its commitment to innovation and creativity while achieving commercial success. Unlike other AI-pharma companies, Quris' highly scalable Patients-on-a-Chip platform with real-time nano-sensing, run thousands of experiments cost-effectively, thereby generating proprietary, highly predictive data that trains the AI. A first AI-based Fragile-X drug is preparing for clinical testing in 2022. Additionally, the company aims to provide personalized medicine services by establishing stem cell centers worldwide, continuing to validate its platform further, and growing through strategic partnerships with industry and research institutes.

For its strong overall performance, Quris Technologies Ltd. is recognized with Frost & Sullivan's 2022 European Technology Innovation Leadership Award in the AI-enabled drug safety prediction industry.

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™

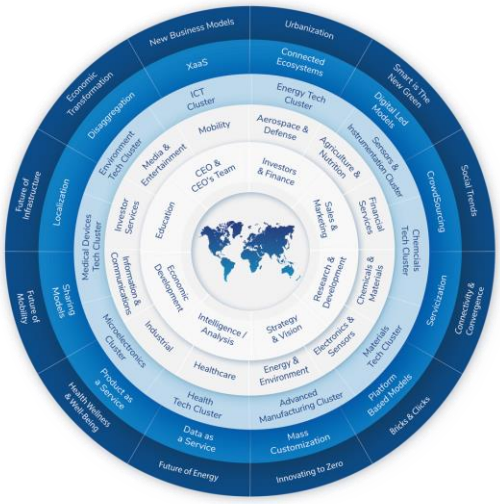
Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled by the Innovation Generator™.
Learn more.

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:

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