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Rethinking R&D: BullFrog AI White Paper Outlines New Blueprint for Smarter Drug Development

From target discovery to trial optimization, bfLEAP™ empowers biopharma teams to predict therapeutic success with greater confidence

In a $200B+ market crowded with black-box AI, BullFrog AI's bfLEAP™ delivers what others can't: biologically grounded, composition-aware analytics that guide smarter therapeutic decisions

GAITHERSBURG, Md., July 22, 2025 (GLOBE NEWSWIRE) -- BullFrog AI Holdings, Inc. (NASDAQ: BFRG; BFRGW) ("BullFrog AI" or the "Company"), a technology-enabled drug development company using artificial intelligence ("AI") and machine learning to enable the successful development of pharmaceuticals and biologics, today announced the release of a new white paper titled *"Why Drug Discovery Fails and How AI is Changing the Equation."*

The publication offers a compelling critique of conventional approaches to biopharma R&D—where nearly 90% of drug candidates still fail in clinical trials—and outlines a forward-looking, biology-native AI framework designed to reverse that trend. At the center of this new blueprint is bfLEAP™, BullFrog AI's proprietary platform engineered specifically to account for the complexity, dimensionality, and biological nuance of therapeutic development.

"Too much of today's drug development is driven by black-box algorithms and intuition," said Vin Singh, Founder and CEO of BullFrog AI. "Our white paper makes the case that it's time to rethink the way the industry approaches R&D. We need AI that's built for biology, grounded in causality, and transparent in its conclusions. That's exactly what bfLEAP™ delivers."

A Platform That Spans the Drug Development Lifecycle

Unlike generic AI models that struggle with "short and wide" datasets, compositional variables, and biological non-linearity, bfLEAP™ was purpose-built to decode biomedical complexity. Built on technology originating from the Johns Hopkins University Applied Physics Lab, the platform enables actionable insight at every stage of the drug development pipeline:

- **In Early Discovery:** Identify targets with high mechanistic potential based on molecular data
- **In Preclinical and Phase I Trials:** Detect subpopulations most likely to respond to treatment
- **In Late-Stage Trials and Post-Market:** Stratify patients by genetic and behavioral

variables, optimize endpoint design, and uncover hidden success patterns in trial data

These capabilities are powered by causal AI, combinatorial modeling, and proprietary techniques for handling sparse, high-dimensional data. Crucially, bfLEAP™ applies composition-aware transformations, correcting for the misleading patterns that plague many current AI systems when analyzing gene expression, microbiome, or other proportional datasets.

“Most AI fails in biology because it was never meant for biology,” said Dr. Juan Felipe Beltrán, Associate Director of AI/Machine Learning at BullFrog AI and a contributor to the paper. “When sample composition varies, it introduces noise that traditional models can't handle. bfLEAP™ is different. We built it from the ground up to detect real signals in complex, messy biomedical data.”

Strategic Differentiation in a Rapidly Growing Market

With AI in drug discovery projected to surpass $35 billion by 2034, BullFrog AI is positioning bfLEAP™ as a category-defining solution that goes beyond automation to deliver scientific clarity. The platform is now a core engine behind BullFrog’s broader Data Networks™ Solutions Library, which includes recently launched modules like bfPREP™, designed to automate data preparation for AI readiness.

As biopharma organizations look to reduce failure rates and accelerate development cycles, BullFrog AI’s measurement-centric, explainable approach stands apart from traditional AI vendors. Instead of retrofitting generic tools, the Company offers domain-native analytics that improve the odds of therapeutic success while maintaining transparency, interpretability, and scientific rigor.

Download the White Paper

The full white paper, *“Why Drug Discovery Fails and How AI is Changing the Equation,”* is now available at: https://bullfrogai.com/resources/why-drug-discovery-fails-and-how-ai-is-changing-the-equation/

About BullFrog AI

BullFrog AI leverages Artificial Intelligence and machine learning to advance drug discovery and development. Through collaborations with leading research institutions, BullFrog AI uses causal AI in combination with its proprietary bfLEAP™ platform to analyze complex biological data, aiming to streamline therapeutics development and reduce failure rates in clinical trials.

For more information visit BullFrog AI at: https://bullfrogai.com

Safe Harbor Statement

This press release contains forward-looking statements. We base these forward-looking statements on our expectations and projections about future events, which we derive from the information currently available to us. Such forward-looking statements relate to future events or our future performance, including: our financial performance and projections; our revenue and earnings; and our business prospects and opportunities. You

can identify forward-looking statements by those that are not historical in nature, particularly those that use terminology such as "may," "should," “could,” “will,” "expects," "anticipates," "contemplates," "estimates," "believes," "plans," "projected," "predicts," "potential," or "hopes" or the negative of these or similar terms. In evaluating these forward-looking statements, you should consider various factors, including: our ability to change the direction of the Company; our ability to keep pace with new technology and changing market needs; our and our partners’ ability to market and sell our offerings and services, including BullFrog Data Networks™ and the competitive environment of our business. These and other factors may cause our actual results to differ materially from any forward-looking statement. Forward-looking statements are only predictions. The forward-looking events discussed in this press release and other statements made from time to time by us or our representatives, may not occur, and actual events and results may differ materially and are subject to risks, uncertainties, and assumptions about us. We are not obligated to publicly update or revise any forward-looking statement, whether as a result of uncertainties and assumptions, the forward-looking events discussed in this press release and other statements made from time to time by us or our representatives might not occur.

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