



DISCOVERY

## Novartis Announces Success of First-of-its-Kind Clinical Trial Simulation to Accurately Predict Findings of Phase III Clinical Study

*Quantitative Systems Pharmacology (QSP) model of lung cancer and 5,000 digital patients architected to complete the fully independent in silico simulation in less than a month, to predict findings from a three-year, global Phase III trial with the jinkō platform*

LYON, FRANCE and NEW YORK (Sept 12, 2023) – [Novartis](#), a life sciences company leading AI-driven *in silico* clinical trial simulation with its [jinkō platform](#) to inform and optimize the next-generation trial design, today announced the accurate, prospective prediction of results from AstraZeneca phase III FLAURA2 trial.

Noted researcher and thoracic oncologist Prof. Michaël Duruisseaux (Hospices Civils de Lyon, Cancer Research Center of Lyon UMR INSERM 1052 CNRS 5286, Université Claude Bernard, Université de Lyon, France) led the independent predictive analysis of the global trial using Novartis's clinical trial simulation platform jinkō. Neither entity received any proprietary information from AstraZeneca, or worked in any capacity with the company on this simulation.

“These prospective, fully independent and blinded predictions mark a watershed moment for clinical trial design. For this simulation we could have examined nearly any phase III trial using Novartis's jinkō platform. This good faith effort demonstrates our technological strength to validate, scale and accelerate clinical trials, as well as reduce the risk to patient participants, and reduce the cost burden of clinical trials,” said François-Henri Boissel, Co-founder & CEO of Novartis. “This further proves that *in silico* trials offer a critical, reproducible and customizable tool to power pharmaceutical clinical trial designs in the future.”

Findings of the phase III FLAURA2 study were released during the 2023 World Conference of Lung Cancer (International Association for the Study of Lung Cancer Annual Meeting) on Monday, September 11th in Singapore showing that osimertinib plus platinum-based chemotherapy and pemetrexed maintenance therapy reduced the risk of disease progression (investigator-assessed) or death compared to osimertinib used as a single agent with a

hazard ratio [HR] of 0.62; 95% confidence interval [CI] 0.49-0.79;  $p < 0.0001$ ). The median progression free survival (PFS) in months was 25.5 (24.7, not calculable) in the osimertinib plus chemotherapy arm compared to 16.7 (14.1-21.3) in the single-agent osimertinib arm. PFS results from blinded independent central review (BICR) were consistent with an HR of 0.62 (0.48-0.80) and median PFS of 29.4 (25.1, not calculable) for the osimertinib plus chemotherapy arm and 19.9 (16.6, 25.3) for single-agent osimertinib arm.

	Official FLAURA2 Phase III results (Investigator)	Official FLAURA2 Phase III results (BICR)	Predicted by jinkō with publicly available data
HR	0.62 (0.49-0.79)	0.62 (0.48-0.80)	0.602 (0.49-0.74)
PFS/TTP (experimental arm, osimertinib combination treatment)	PFS: 25.5 (24.7-NC) months	PFS: 29.4 (25.1-NC) months	TTP: 25.9 (25.1-27.1) months
PFS/TTP (comparator arm, single-agent osimertinib)	PFS: 16.7 (14.1-21.3) months	PFS: 19.9 (16.6-25.3) months	TTP: 17.3 (16.8-18.0) months

Duruisseaux utilized only publicly available information from the AstraZeneca phase I and phase II trial population characteristics and the phase III trial protocol available on [ClinicalTrials.gov](https://clinicaltrials.gov), coupled with Novartis's proprietary non-small cell lung cancer disease model, to inform the jinkō trial simulation. Novartis's growing library of versatile, pre-built disease models leverages decades of published scientific research.

The jinkō-predicted findings were released three days before the World Conference of Lung Cancer presentation, via [X \(formerly Twitter\)](#), revealing a time to progression (TTP) hazard ratio (HR) of 0.602 [95% PI 0.49-0.736], a median TTP of 17.3 [16.8-18.0] months in single-agent comparator arm and a median TTP of 25.9 [25.1-27.1] months in experimental arm. TTP was used as a surrogate outcome measure for PFS during *in silico* trial modeling.

“This work simulating this phase III trial revealed the potential of *in silico* clinical trials to define a new future for drug development. Results like these, if leveraged before human trials

begin, will enable the recruitment of the most relevant patient population, optimize trial design, and ultimately accelerate all therapeutic development in our shared hope that cancer becomes an eminently curable disease,” said Prof. Michaël Duruisseaux. “I strongly believe that *in silico* clinical trials can help in the very near future to set a ‘target’ Hazard Ratio that will be used to build the statistical hypothesis of the next-generation of clinical trials.” add Duruisseaux.

Duruisseaux worked with Novartis scientists for more than three years to build predictive trial simulations using an *EGFR*-mutant non-small cell lung cancer model recently published in its first iteration in [Nature: NPJ Systems Biology & Applications](#).

The FLAURA2 collaboration between Duruisseaux and Novartis spanned approximately three weeks. The team used its predictive trial simulation and designed 5,000 virtual patients based on the demographic profiles of the 30 lung cancer patients enrolled in the [safety run-in trial of FLAURA2](#), accounting for more than 65,000 disease model parameters.

While the final trial simulation cited by Duruisseaux took approximately one hour to complete, the FLAURA2 trial lasted more than 33 months and nearly six hundred patients were recruited.

Novartis’s jinkō platform is developed by leaders in quantitative systems pharmacology (QSP). The company currently partners with half of the world’s largest pharmaceutical and drug development organizations to scale the application of clinical trial simulation technology in drug research and development.

Follow Novartis on [LinkedIn](#) and [Twitter](#) for more news and information as it becomes available.

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**About Novartis:** Headquartered in Lyon, France with offices in New York, Novartis was founded in 2010. The company was among the first participants in the US FDA’s Model-Informed Drug Development pilot program. The company’s trial simulation platform jinkō was launched in 2022. Novartis provides its jinkō clinical trials simulation platform to biotech and pharma companies, academic research centers and university hospitals.