

Google unveils Gemini-based 'AI co-scientist' with lab-validated hypotheses

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Title: Accelerating scientific discovery with Co-Scientist

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Abstract: Scientific discovery is driven by scientists generating novel hypotheses for complex problems that undergo rigorous experimental validation. To augment this process, we introduce Co-Scientist, a multi-agent AI system built on Gemini for structured scientific thinking and hypothesis generation. Co-Scientist aims to help scientists discover new original knowledge. Conditioned on their research objectives and prior scientific evidence, it formulates demonstrably novel research hypotheses for experimental verification. The system's design involves agents continuously generating, critiquing and refining hypotheses accelerated by scaling test-time compute. Key contributions include: (1) a multi-agent architecture with an asynchronous task execution framework for flexible compute scaling; (2) a tournament evolution process for self-improving hypotheses generation. Automated evaluations show continued benefits of test-time compute scaling, improving hypothesis quality over time. While general purpose, we focus the validation in three biomedical applications: drug repurposing, novel target discovery, and explaining mechanisms of anti-microbial resistance. Specifically, Co-Scientist helped identify new drug repurposing candidates and synergistic combination therapies for acute myeloid leukemia, which were validated through in vitro experiments. These real-world validations demonstrate the potential of Co-Scientist to accelerate scientific discovery and usher in an era of AI empowered scientists.

Comments: 157 pages in total (main 42 pages, supplementary information 115 pages), 4 main figures, 1 main table, 6 extended data figures, 2 extended data tables, 9 supplementary figures, 4 supplementary tables, 37 main references, 117 supplementary references. Nature (2026)

Subjects:

Artificial Intelligence (cs.AI) ; Computation and Language (cs.CL); Human-Computer Interaction (cs.HC); Machine Learning (cs.LG); Physics and Society (physics.soc-ph); Other Quantitative Biology (q-bio.OT)

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