# AI-powered platform for scientific discovery

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## 1. Introduction

Modern scientific progress is advancing at a fast pace, making it essential for researchers to efficiently gather information and keep up with state-of-the-art methods. Current advances in AI models lead to the integration of large pre-trained models into many routines, but researchers do not have a place that brings together AI tools and the efficient workspace of a scientist in a single tool. To address these issues, we are developing a prototype of a web-based platform that will integrate AI-driven tools specifically designed for scientific research across different disciplines as well as efficient note tracking into a single platform.

The prototype aims to explore how artificial intelligence can assist researchers in literature review and analysis, hypothesis generation and in specific tasks where AI can already be integrated while maintaining the required level of quality. Such tasks arise, for example, in the fields of drug discovery [1] and climate modeling [2]. Recent releases of automated research with AI agents [3] are bringing the research community closer to independent scientific discoveries with AI. Further advances in AI research will include domain-specific AI tools tailored to the unique needs of different scientific fields, from automated data interpretation in biomedicine to AI-enhanced simulations in physics and chemistry. In addition, intelligent work with bibliography will help users to efficiently navigate scientific literature and emerging research trends.

Ultimately, the platform will go beyond assisting researchers and become capable of making independent scientific discoveries. By using advanced AI agents that can analyze vast amounts of data, identify hidden patterns, generate and validate new hypotheses, the platform has the potential to contribute to breakthroughs in scientific fields.

This paper presents the concept of the platform's framework, outlines its intended functionalities and potential impact on the research community. While the platform is still at the prototype stage, we discuss the opportunities in developing AI-driven tools for scientific discovery and propose future directions for its implementation.

## 2. Scientific Discovery

Scientific research generally follows a structured process, typically involving literature review, data collection and analysis, hypothesis testing, collaboration and presentation the work done (Figure 1).

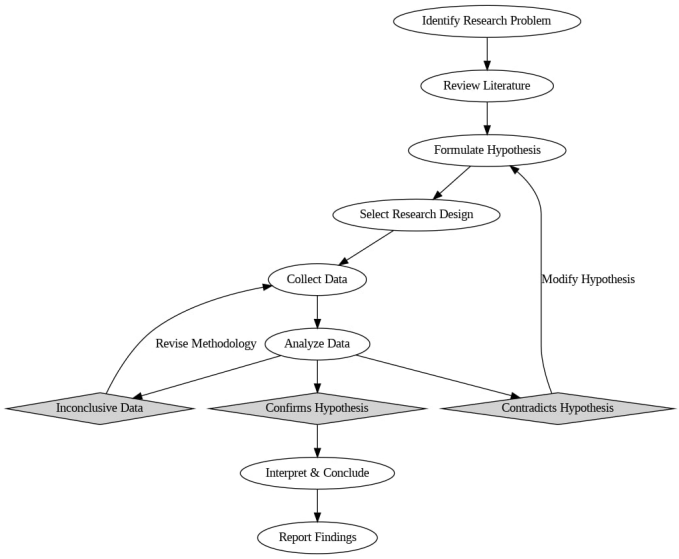


Fig. 1: General scheme of a scientific routine.

Each stage presents bottlenecks [4] that can slow progress, which the platform aims to address.

**Review literature** Finding relevant studies is becoming increasingly time-consuming due to the growing volume of scientific literature. The platform will use an AI-powered search, recommendation and literature review system to help researchers quickly identify key papers and summarize findings.

**Collect and analyze data** The collection and analysis of data often depends on a valid experiment design. The platform will support the design of experiments to optimize data collection strategies by using an AI assistant.

**Test hypothesis** Researchers refine hypotheses through iterative testing and peer review. At the hypothesis generation stage, the AI-driven simulations and AI assistant can validate ideas.

**Report results** Finally, the research should be presented to either research peers or industry partners. In each case, the results should be delivered in a specific structure and format. AI-powered writing assistants will improve the clarity of manuscripts and the speed of document preparation.

Over time, the platform aims to evolve beyond an assistant tool, using AI to generate hypotheses and contribute to new scientific discoveries.

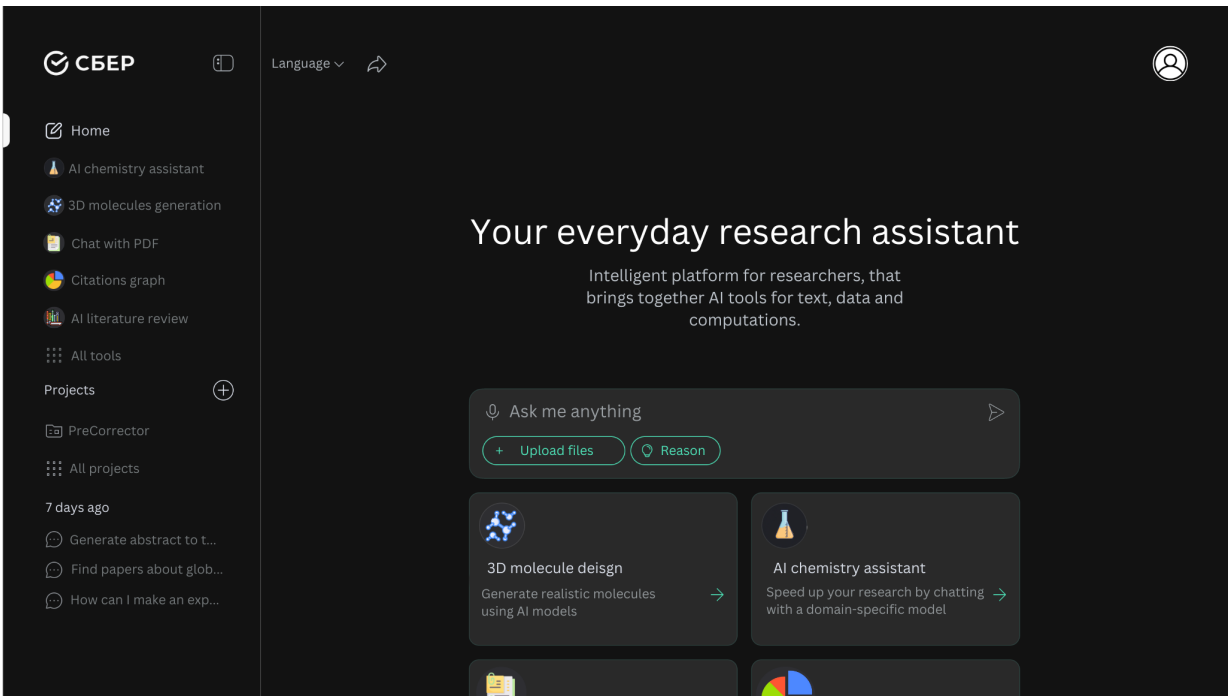


Fig. 2: The interface of the prototype platform.

## 3. Scientific Discoveries by AI

The integration of AI agents into research is revolutionizing the discovery process, enabling autonomous hypothesis generation with data collection and analysis. Recent advances have demonstrated the potential of AI to perform as independent researchers, accelerating scientific innovation in various fields. Several recent papers demonstrate that AI systems are now capable of conducting scientific research.

The AI Scientist [5] enables large language models to independently generate novel research ideas, write code, conduct experiments, visualize results and write complete scientific papers. By simulating an entire research cycle, the AI Scientist demonstrates how AI agents can autonomously contribute to scientific knowledge without human supervision.

The AI co-scientists [6] are designed to act as virtual collaborators for biomedical researchers, using advanced reasoning to process extensive scientific literature and generate new hypotheses. In biomedical studies, the AI co-scientist provided promising solutions that could accelerate experts. This indicates that AI agents can effectively augment and accelerate the work of human scientists.

Frameworks that simulate AI-driven scientific collaboration [7] that utilizes multiple LLM and rule-based agents to autonomously conduct scientific research by transforming annotated data into transparent, verifiable research papers. Overall, the study highlights the potential for AI-driven research to accelerate scientific discovery while maintaining key principles of transparency, traceability, and verifiability

## 4. Interface and Core Modules

The usefulness of the platform depends not only on its advanced AI capabilities, but also on an intuitive and accessible note-tracking tool. The platform is designed to provide a seamless user experience, allowing researchers to focus on their work rather than struggling with complex tools (Figure 2). The initial prototype will have two core modules: an AI-powered research assistant and a note-taking tool, similar to advanced tools such as Obsidian [8]. The GigaChat based AI-powered research assistant will correct and generate text on the fly based on the context of the document.

Intelligent note-taking will allow users to annotate papers, extract key insights and organize their thoughts in a structured notes with the AI-assistant designed to make the platform's capabilities easier to use.

With these foundational cores, the platform will provide an AI-powered environment that increases productivity and simplifies scientific exploration. Future iterations will extend these capabilities, integrate more specialized tools for different disciplines and ultimately lead to the independent scientific breakthroughs by AI.

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