# Claude Code in Life Sciences: Practical Applications Guide

By Adrien Laurent, CEO at IntuitionLabs • 11/25/2025 • 35 min read

claude code claude for life sciences ai in life sciences bioinformatics computational biology genomics data analysis research automation anthropic



# **Executive Summary**

This report examines the practical applications of **Claude Code** – Anthropic's Al coding assistant – in the life sciences. Claude Code is an "agentic" Al developer tool that can autonomously generate, modify, and analyze software code. In life sciences contexts, Claude Code can greatly accelerate research and development by automating data analysis pipelines, generating scientific figures and reports, and integrating with specialized laboratory tools. We provide historical context on Al in biology, explain Claude Code's architecture (including its connectors and "agent skills"), survey detailed use cases (from genomics data analysis to regulatory document drafting), and present case studies of industry adoption. We also analyze evidence of productivity gains (e.g. reported 10× speed-ups in code development and literature review acceleration) and discuss challenges (such as model **hallucinations**, data privacy, and regulatory compliance). Finally, we look ahead to future trends, including deeper integration of Al into lab workflows, expanded LLM-based tools for computational biology, and the implications of automating scientific work. All claims are supported with citations to credible sources.

# **Introduction and Background**

#### Al and Automation in the Life Sciences

Modern life sciences research generates *massive*, *complex datasets*: next-generation sequencing alone produces petabytes of data per year. Manually analyzing this data and synthesizing the literature is labor-intensive. For example, systematic literature reviews can take ~18 months to complete by traditional means (rewire.it) (<sup>[1]</sup> dhruvirzala.com), and large clinical trials cost hundreds of millions of dollars with lengthy regulatory delays. To cope, the industry has steadily adopted computational tools: bioinformatics pipelines, laboratory information management systems (LIMS), and electronic lab notebooks (ELNs) are commonplace. Recently, large language models (LLMs) like OpenAI's GPT series and Anthropic's Claude have shown promise in science tasks (e.g. summarizing papers, drafting text, even generating hypotheses). However, until now these tools were limited by narrow context windows, lack of integration, or general-purpose orientation.

Anthropic's entrance into life sciences with **Claude** (Launched October 2025) and its **Claude Code** platform represents a major step toward *Al-augmented discovery*. Unlike a standard chatbot, *Claude for Life Sciences* is explicitly customized for biomedical research. Its **Sonnet 4.5** model was benchmarked on science tasks (scoring 0.83 on the Protocol QA benchmark, exceeding a human expert baseline of 0.79 ([2] www.anthropic.com)), indicating strong comprehension of experimental procedures. Crucially, Claude embeds directly into scientists' workflows via **connectors** (to Benchling, 10x Genomics, PubMed, etc.) and **agent skills** (codified analysis protocols) (rewire.it) ([3] www.anthropic.com). This architecture helps anthropic position Claude as an "operating system" for research rather than a standalone chatbot.

#### What is Claude Code?

Claude Code is an Al-powered coding assistant from Anthropic designed for developers. It offers a **command-line interface (CLI)** and IDE plugins that allow users to query their codebase, fix bugs, and generate new code using natural language. For example, a promotional prompt shows Claude Code analyzing a single-cell RNA-seq dataset, creating a heatmap of differentially expressed genes, and identifying enriched pathways ([4] www.claude.com). In practical terms, Claude Code can *understand a user's project context*, use existing libraries, and even run local tools via the terminal. It is available via Anthropic's **Pro** and **Max** plans (with Sonnet 4.5 and

older Opus 4.5 models) and provides an API for integration (<sup>[5]</sup> www.claude.com). Recently, Claude Code's reach expanded beyond the developer's terminal: in Oct 2025 it was released in a "research preview" on the web and iOS apps (<sup>[6]</sup> dataconomy.com) (<sup>[7]</sup> siliconangle.com), allowing management of multiple coding tasks concurrently in a browser interface.

The significance of Claude Code is illustrated by Anthropic's internal use: the company reports Claude Code wrote  $\sim$ 90% of its own codebase, boosting engineering productivity by  $\sim$ 67% and generating a >\$500M revenue run-rate ( $^{[8]}$  dataconomy.com) ( $^{[9]}$  siliconangle.com). By analogy, life sciences organizations are exploring using Claude Code to rapidly implement bioinformatics pipelines and data analysis scripts that would traditionally take months.

# Architecture and Capabilities of Claude for Life Sciences

## **Advanced Scientific Reasoning**

The backbone of Claude for Life Sciences is an LLM (Sonnet 4.5) fine-tuned for scientific content. Anthropic reports that Sonnet 4.5 achieves high marks on specialized benchmarks: for instance, **Protocol QA** (labiQ) scores went from 0.74 (Sonnet 4) to 0.83 ([2] www.anthropic.com), exceeding human performance. Similarly, a "BixBench" bioinformatics evaluation showed strong results. These gains indicate Claude can parse detailed lab protocols and genomic analysis tasks. As Anthropic notes, a model must understand conditional logic and specialized terminology to be useful in the lab (rewire.it). In practice, this means Claude can *comprehend* experimental methods, follow complex multi-step procedures, and reason about genomics or chemical data with domain-specific context.

#### **Connectors to Scientific Tools**

A key feature of Claude for Life Sciences is its **connectors** – APIs that let Claude "reach into" data platforms and software used in biomedical R&D (rewire.it) ([10] support.claude.com). Instead of treating Claude as separate, users access it within environments they already trust. The initial set of connectors includes (designated by Claude's MCP – Model Context Protocol – framework):

- **Benchling** (R&D ELN/LIMS). Allows Claude to query experimental records, plasmid maps, sequences, and other structured lab data. Users can ask, for example, "show me every experiment involving protein X," and Claude returns results with links back to source notebooks ([3] www.anthropic.com) </current\_article\_content>([11] support.claude.com).
- 10x Genomics (single-cell & spatial analysis). Integrates with 10x Cloud pipelines (e.g. Cell Ranger) so Claude can process raw single-cell or spatial data on-demand ([12] www.anthropic.com) ([13] support.claude.com). Researchers can align reads, generate count matrices, cluster cells, or visualize spatial gene patterns via plain-English prompts rather than coding. As a press release notes, this makes advanced single-cell analysis accessible to non-programmers ([14] www.biospace.com).
- **PubMed**. Lets Claude search and retrieve literature from millions of biomedical abstracts and papers.

  Claude can read and cite literature on-the-fly for context ([15] www.anthropic.com) ([16] support.claude.com).
- Wiley Scholar Gateway ('Scholar Gateway by Wiley'). Accesses Wiley's repository of scientific journals to pull authoritative content into conversations ([17] www.anthropic.com) ([18] support.claude.com).



- Synapse.org (Sage Bionetworks). Enables retrieval of public and private research data and metadata stored on the Synapse research data platform ([19] www.anthropic.com).
- **BioRender**. Connects Claude to BioRender's library of scientific illustrations, enabling automatic figure creation or suggestion of icons and templates for presentations ([17] www.anthropic.com) ([20] support.claude.com).

These were highlighted both in Anthropic's announcement ([17] www.anthropic.com) ([11] support.claude.com) and in pr reports ([14] www.biospace.com). Additional integrations (Databricks, Snowflake, Microsoft 365, etc.) allow Claude to access large-scale data or enterprise knowledge bases. The net effect is that Claude becomes an **orchestrator** of the researcher's data ecosystem, eliminating tedious data transfers. For example, a demonstration showed Claude pulling experimental data from Benchling, auto-generating comparison tables, and even updating the Benchling records ([21] dataconomy.com) ([22] siliconangle.com).

Table 1 (below) summarizes key Claude Life Sciences connectors and their roles:

Connector / Integration	Purpose / Capability	Source
Benchling (R&D platform)	Query experiments, lab records, and notebooks with natural language; returns answers linked to source data (e.g. "show me experiment results for gene X with link to original notebook").	Claude docs ([11] support.claude.com)
10x Genomics Cloud	Conversational single-cell and spatial workflows. Tasks like read alignment, gene matrix generation, clustering, etc., can be done via plain-English prompts. Makes advanced genomics accessible to non-technical users ([14] www.biospace.com) ([13] support.claude.com).	10x press release ([14] www.biospace.com)
PubMed	Access biomedical literature abstracts/papers. Claude can search, summarize, and cite relevant studies during analysis or literature reviews ([15] www.anthropic.com) ([16] support.claude.com).	Anthropic news ( <sup>[15]</sup> www.anthropic.com)
Wiley Scholar Gateway	Retrieve peer-reviewed research content from Wiley journals within Claude (authenticated). Ensures Claude's responses have citations to authoritative sources.	Claude docs ( <sup>[3]</sup> www.anthropic.com)
Synapse (Sage)	Retrieve and query research datasets stored on Synapse, including data project structures and customized searches. Facilitates collaboration on genomics data.	Claude docs ( <sup>[19]</sup> www.anthropic.com)
BioRender	Access BioRender's library to generate or incorporate scientific figures/icons into reports and slides. Streamlines creation of publication-quality diagrams.	Claude docs ([3] www.anthropic.com)

Table 1. Representative Claude Life Sciences "connectors" and their functions. Claude links to Benchling, PubMed, 10x Genomics, etc., enabling natural-language access to laboratory data and literature ([3] www.anthropic.com) ([11] support.claude.com).

## **Agent Skills and Workflows**

Beyond one-off queries, Claude for Life Sciences supports **Agent Skills** – reproducible workflows packaged as "Claude skills." For example, Anthropic's first released skill is **single-cell-rna-qc**, which automates the quality-control step of single-cell RNA-seq analysis using best practices from the scverse toolkit ([23] www.anthropic.com). A researcher can simply invoke this skill on raw data and get cleaned output tables without manual coding. The idea is to turn routine bioinformatics sub-tasks (QC, clustering, differential expression) into callable functions of Claude. Users can also author custom skills for their proprietary pipelines. This emphasis



on "one-click" scientific protocols helps ensure consistency and sharing of best practices among teams (rewire.it) ([23] www.anthropic.com).

#### **Research Tools and Interfaces**

Claude for Life Sciences is accessible via Claude Al's Pro/Max plans or Team plan seats ([24] support.claude.com). In addition to the connectors, users have access to a prompt library of life science templates and special support. Data analysis can happen in multiple formats: Claude can output results as slides, documents, or code notebooks ([25] www.anthropic.com). For coding specifically, Claude Code runs in a (WSL-like) sandboxed environment. In October 2025, Anthropic announced that Claude Code is now available on the Claude web and iOS interfaces ([6] dataconomy.com) ([7] siliconangle.com). This shift lets developers run Claude Code on GitHub repos or multiple tasks from a web UI. (The sessions are isolated and proxy-secured to prevent unauthorized code access ([26] dataconomy.com) ([27] siliconangle.com).) These features let research teams deploy Claude Code in corporate R&D settings, overseen by compliance officers.

## **Practical Use Cases in Life Sciences**

Anthropic and its partners describe many concrete applications of Claude Code in life sciences R&D. The figure below and the following sections illustrate key use-case categories, supported by evidence and examples.

## **Literature Review and Hypothesis Generation**

One of the most time-consuming research tasks is literature review. Claude's large 1M-token context window allows it to digest dozens of papers in one session. For example, researchers have used Claude to summarize complex figures from papers—a common bottleneck—achieving accuracy deemed comparable to human analysis (rewire.it). Anthropic notes that while manual reviews take ~18 months on average (rewire.it) ([1] dhruvirzala.com), Claude can compress the same work into days or hours. It can retrieve and cite relevant publications from PubMed or Wiley and generate structured summaries with references (rewire.it) ([3] www.anthropic.com). This "connected literature review" capability means Claude Code can help a biologist to quickly gather background, find contradictions in the field, or automatically propose testable hypotheses from the aggregated knowledge. A case in point: a life sciences team (FutureHouse, cited by Anthropic) reports using Claude to analyze figures within papers and conduct non-linear literature searches far faster than before ([28] www.anthropic.com).

Moreover, Claude can generate research "agents" from papers. For example, Stanford's researchers are developing "Paper2Agent" with Claude, which transforms a published protocol into an executable analysis agent  $(^{[29]}$  www.anthropic.com). This allows codifying methods straight from the science literature. In summary, for information synthesis, Claude Code serves as an AI research assistant that can both scan and codify literature.

## **Bioinformatics and Data Analysis**

#### Sequence and Genomic Data

A core life-sciences use-case is genomic data analysis, where Claude Code excels by writing and iterating code for common bioinformatics tasks. The 10x Genomics connector lets Claude process single-cell RNA-seq and spatial data interactively. As the 10x Press Release explains, researchers can perform alignment, matrix



generation, clustering, and downstream analysis via conversational prompts ([14] www.biospace.com). This is a game-changer: tasks that normally require specialist scripting are now done by higher-level instructions. Similarly, the single-cell-rna-qc agent skill encapsulates best practices (filtering out low-quality cells, identifying doublets, etc.) so that those first QC steps happen automatically ([23] www.anthropic.com). By automating QC, Claude Code frees scientists to focus on interpretation, not wrangling data.

Beyond single-cell, Claude Code can aid bulk RNA-seq, whole-genome, and proteomics analyses. Users report using Claude Code to generate Python or R scripts for differential expression pipelines, sequence alignment, or phylogenetic trees. For instance, Schrödinger – a computational drug-discovery firm – credits "Claude Code" with generating code more than 10× faster than previous methods (rewire.it) ([30] www.claude.com). They used it for developing cheminformatics and simulation platforms. The underlying process typically involves a scientist describing the needed pipeline and Claude outputting working code with tests. Once validated, Claude often documents and packages the workflow. Early adopters like Axiom Bio (drug toxicity) have used *billions of tokens* of Claude Code to build agents that query chemical and clinical databases (rewire.it) ([31] www.anthropic.com).

#### **Data Visualization and Figures**

Claude Code also assists with scientific visualization. The BioRender connector enables making diagrams by request. For example, one can ask Claude to generate a figure of a signaling pathway or to assemble icons for a slide. Claude can also write code to produce plots: as illustrated on the developer site, Claude Code can create a heatmap of gene expression ([4] www.claude.com). In practice, a researcher might instruct Claude Code to take a gene expression matrix (Excel, CSV, etc.), run a PCA, and output a labeled scatter plot, all in minutes. This automates routine analysis reporting. The Life Sciences site highlights this: Claude can create slide decks with integrated graphs (from either code or BioRender) directly from analysis ([32] www.anthropic.com).

#### **High-Performance and Cloud Tools**

Claude Code can generate jobs for specialized cloud tools as well. For instance, a user could have Claude formulate queries for a Databricks environment or construct Snowflake SQL to sift through large bioinformatics tables. Integration with Microsoft 365 or Google Cloud means Claude can pull in large datasets or push results to shared drives. This wide compatibility ensures that life sciences organizations using diverse computing environments can incorporate Claude Code into existing pipelines. Importantly, Claude Code can also adhere to organizational practices: Schrödinger notes that outputs can be made *GxP-compliant* (i.e. meeting FDA good-practice standards) through guided prompting and review ([33] www.anthropic.com).

## **Protocol Design and Regulatory Documentation**

Beyond data, life sciences R&D involves extensive written documentation (protocols, SOPs, consent forms, reports). Claude can draft and optimize these texts. For example, with the Benchling connector, Claude can pull relevant experimental context and automatically draft a study protocol or standard operating procedure ([34] www.anthropic.com). A Benchling-integrated Claude could answer a prompt like "Create a cell culture protocol for virus infection given our lab's conditions", referencing previous successful experiments. Similarly, Claude can paginate and format reports for regulatory submission or clinical trial documentation. Anthropic cites Novo Nordisk's use of Claude for "document and content automation" across pharma development ([29] www.anthropic.com). Claude can ingest finished experiment data and produce the narrative and tables needed for an Investigator Brochure or Clinical Study Report in minutes. In one demo, a preclinical researcher had Claude produce a complete regulator-ready study report from Benchling data that traditionally took days to compile ([21] dataconomy.com). While final validation is still done by humans, this can drastically reduce the drudge of paperwork, freeing scientists for analysis.

### **Enterprise Knowledge and Decision Support**

Another application is **knowledge management**. Large pharma companies like Sanofi have used Claude to build internal **"Concierge"** apps (Retrieval-Augmented Generation) that answer employees' questions by querying the company's data silos (rewire.it) ([35] www.claude.com). For instance, Claude can be connected to proprietary databases of compound libraries, clinical trial results, or SOP archives. A chemist might query "Which compounds with sub-100 nM activity did we develop against target Y?" and Claude will retrieve and summarize. Claude Code itself offers a way to automate queries against proprietary APIs or databases: e.g. constructing SQL queries or API calls on-the-fly. This unifies information access — important lagging-work in pharma — by breaking silos. Deploying such RAG systems can cut days-long research tasks into minutes (rewire.it).

#### **Illustrative Case Studies**

Several organizations have publicly shared how they're leveraging Claude Code:

- Schrödinger (Computational Chemistry): Reportedly uses Claude Code to accelerate its software development. By describing needed functions, Schrödinger's teams have Claude generate transformation code used in drug modeling pipelines. They observed that "for the projects where it fits best, Claude Code allows us to turn ideas into working code in minutes instead of hours, enabling us to move up to 10× faster in some cases" ([30] www.claude.com) (rewire.it). This has reportedly shortened development cycles and facilitated rapid prototyping of new simulation tools.
- 10x Genomics (Genomics Hardware/Software): Integrated Claude for natural-language analysis of single-cell data ([12] www.anthropic.com) ([14] www.biospace.com). The CEO notes this lowers barriers: bench scientists without coding skills can now analyze their sequencing experiments by asking Claude ([14] www.biospace.com) ([36] www.claude.com). Early collaborators are testing conversational UIs to explore gene expression and spatial data via Claude.
- Axiom Bio (Drug Safety): Uses Claude Code to build AI agents for predicting drug toxicity ([31] www.anthropic.com) (rewire.it). By feeding chemical properties and clinical data into Claude, supplemented with specialized skills, Axiom trains models that flag potential safety issues. They report using "billions of tokens" of Claude Code and hooking into biomedical databases via MCP servers to optimize feature engineering ([31] www.anthropic.com).
- Novo Nordisk and Genmab (Pharma): These companies highlight document automation use-cases. Novo Nordisk says
  Claude "pull [s] from clinical data sources and create [s] GxP-compliant outputs," accelerating the creation of clinical
  abstraction documents ([25] www.anthropic.com) ([33] www.anthropic.com). Genmab aims to generate compliant
  regulatory submissions from raw data. These use cases underline Claude's role in quality assurance and compliance
  drafting.
- Sanofi: Through an Anthropic partnership, Sanofi integrated Claude with its internal data so that "the majority of Sanofians" use a Claude-powered Concierge daily ([35] www.claude.com). In practice, Claude Code fetches from Sanofi's knowledge base to answer queries across research, manufacturing, and commercial functions, freeing scientists and managers from manual database searches.
- FutureHouse (Bioinformatics Consultancy): Uses Claude for both literature analysis and genomic pipeline tasks. They credit Claude with accurate analysis of figures in papers and orchestrating large-scale literature searches ([28] www.anthropic.com). On the code side, they use Claude Code to write and maintain data-processing scripts, shortening the feedback loop in client projects.

These examples illustrate Claude Code's versatility: from writing code for complex data workflows to drafting narratives and retrieving firm-specific knowledge. Similar anecdotes can be found in industry round-ups and press releases (rewire.it) ([37] www.anthropic.com).

## **Benefits: Evidence and Metrics**

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The practical impact of these use cases is supported by quantitative reports:

- Time savings: Demonstrations show multi-day analyses compressed to minutes ([21] dataconomy.com) ([38] siliconangle.com). For example, generating a dose-comparison report for a preclinical trial (normally days of manual work) took only minutes with Claude ([21] dataconomy.com) ([22] siliconangle.com). In another context, building software features 10x faster means teams can iterate monthly instead of annually (rewire.it).
- Performance benchmarks: Claude Sonnet 4.5 scores significantly on science tests, often above human baselines. This suggests reliability in tasks like protocol comprehension ([2] www.anthropic.com). Additionally, Anthropic claims these models achieve <0.5% hallucination error rates on some tasks, though even such low rates are risky in science and highlight caution (rewire.it).
- Scale-up potential: Anthropic's leadership states a vision for "a meaningful percentage of all life science work" to run on Claude ([39] dataconomy.com) ([40] siliconangle.com). One practical indicator is subscriptions: Claude Code's rapidly rising revenue (~\$500M annualized) and adoption by enterprises imply substantial user interest ([8] dataconomy.com) ([9] siliconangle.com). While not all of that is life science spend, it signals how such tools can scale in R&D budgets.
- User feedback: Prominent industry figures (from biotech CEOs to chief data officers) have publicly endorsed Claude Code's impact on productivity and innovation ([41] www.claude.com) ([14] www.biospace.com). For instance, Serge Saxonov (10x Genomics CEO) emphasizes lowering technical barriers to focus on discovery ([42] www.biospace.com), and Sanofi's CTO notes "efficiency gains" and enterprise deployment through a Claude Concierge ([35] www.claude.com). These testimonials suggest measurable workflow improvements, although formal ROI analyses are still emerging.

# Tables of Use-Cases and Use-Case Examples

To organize the diversity of applications, we present two tables: one categorizing broad task domains, and another giving specific example scenarios with sources.

Table 2: High-Level Life Sciences Task Domains and Claude Code Applications

Task Domain	Claude Use (Examples)		
Literature Review / Knowledge Mining	- Ingest and summarize dozens of papers with citations ( $^{[43]}$ www.anthropic.com) Gen erate hypotheses by cross-linking results across studies (rewire.it).		
Bioinformatics/Data Analysis	- Write pipelines for genomics (alignment, clustering) on demand ([14] www.biospace.com).  - Perform single-cell QC, filter and normalize data via single-cell-rna-qc ([23] www.anthropic.com).  - Generate plots (e.g. heatmaps of gene expression) and statistical analyses ([4] www.claude.com).		
Protocol and SOP Generation	- Draft experimental protocols or consent forms by synthesizing existing SOPs using Benchling data ([34] www.anthropic.com) Translate high-level study goals into structured workflows (e.g. "design an RNA-seq experiment") ([44] support.claude.com).		
Data Visualization and Figures	- Create publication-quality diagrams using BioRender assets ( $^{[3]}$ www.anthropic.com) Programmatically generate and annotate biological plots (e.g. survival curves, molecular structures).		
Regulatory Documentation	- Auto-generate clinical study reports and drug dossiers from data ( $^{[45]}$ dataconomy.com) ( $^{[22]}$ siliconangle.com).		

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Task Domain	Claude Use (Examples)	
	- Ensure outputs meet compliance (GxP) via guided prompting ([33] www.anthropic.com).	
Enterprise Knowledge Management	- Build QA systems (Concierge apps) to answer internal queries using private data (rewire.it) ([35] www.claude.com).  - RAG-enabled retrieval of corporate databases for scientific insights. (rewire.it)	
Collaboration and Training	- Convert research papers into interactive agent assistants (e.g. Paper2Agent) ([29] www.anthropic.com).  - Provide on-demand consultation to scientists (via Claude chat) with life sciences expertise.	

Table 2. Representative life sciences tasks and corresponding Claude Code applications. Claude accelerates literature synthesis, automates data pipelines, drafts protocols, etc., as documented by Anthropic and partners ( $^{[43]}$  www.anthropic.com) ( $^{[74]}$  www.biospace.com).

The above table is a high-level summary. The next table gives concrete examples with cited sources.

**Table 3: Specific Use Case Examples in Life Sciences** 

Use Case / Scenario	Impact / Output	Source
<b>Single-cell RNA-seq QC</b> : Run pre-processing on raw scRNA-seq matrix via Claude's single-cell-rna-qc skill.	Cleaned gene-cell matrix; QC report, before/after plots.	Claude docs ( <sup>[23]</sup> www.anthropic.com)
<b>Conversational genomics analysis</b> : Use the 10x connector to cluster cells and plot gene markers by asking Claude in English.	Feature-barcode matrices, UMAP plots, cell type annotations without coding.	10x PR ( <sup>[14]</sup> www.biospace.com)
<b>Benchling data interrogation</b> : "List all CRISPR edits made on gene <i>PTEN</i> and link to experiment notes."	Table of edits and links to experiment notebooks.	Claude docs ([3] www.anthropic.com)
<b>Literature synthesis</b> : "Analyze 20 papers on CAR-T therapy, summarize key findings, and propose three follow-up experiments."	Structured summary with bullet points and hypotheses, citing sources.	Rewire analysis (rewire.it)
Protocol drafting: Generate an SOP for a cell viability assay given existing SOP examples in Benchling.	Draft protocol text integrating best practices; returns table of required reagents.	Claude docs ( <sup>[46]</sup> support.claude.com)
Clinical report generation: Compare two dosing regimens using Benchling data; compile a regulator-ready report of results.	Auto-filled tables comparing dosages, efficacy, and a narrative report in minutes.	Dataconomy demo ( <sup>[21]</sup> dataconomy.com)
Enterprise RAG Q&A: Query internal databases: "What was our success rate last year for compound optimizations in oncology?"	Natural-language answer referencing internal data, with supplements from Claude.	Anthropic news (rewire.it) ([35] www.claude.com)
<b>Drug toxicity modeling</b> : Use Claude Code to engineer features from chemical and clinical datasets for Al models.	Agent pipeline code for preprocessing data; list of predictive features.	Anthropic partners (rewire.it) ([31] www.anthropic.com)
Figure and slide generation: Create a slide deck summarizing analysis; include figures drawn via BioRender icons.	PPT/pdf with embedded diagrams and charts, ready for presentation.	Claude docs ( <sup>[32]</sup> www.anthropic.com)

Table 3. Selected concrete use cases of Claude Code in life sciences, with outputs and sources. For example, the 10x/Anthropic integration allows common analysis tasks (alignment, clustering, etc.) via conversation ([14])

www.biospace.com), and Benchling integration enables generation of study reports with live data ([21] dataconomy.com) ([34] www.anthropic.com).

# **Data Analysis and Arguments on Efficiency**

Multiple sources quantify the efficiency gains of deploying Al like Claude in R&D. Key points include:

- Benchmark Performance: Claude Sonnet 4.5 achieved accuracy above human on a Lab Protocol QA test
   ([2] www.anthropic.com). This suggests its analysis of procedures is MAR-valid, so humans can rely on it as
   an "assistant scientist".
- Context Size: With a 1,000,000 token context, Claude can analyze vast documents at once (rewire.it). This enables literature surveys that would be impossible for prior LMs with limited context.
- Speedups: Partners report 10× or greater time savings in specific workflows (rewire.it) ([30] www.claude.com). For example, Schrödinger's claim of going "up to 10× faster" on coding tasks ([30] www.claude.com) aligns with internal report of 67% productivity boost (suggesting near 3× speedup overall). In drug R&D pipelines, time-consuming tasks like data aggregation and report drafting are cut from days to minutes ([21] dataconomy.com) ([22] siliconangle.com).
- Scale and Deployment: Anthropic's goal to have "a meaningful percentage" of global life-sciences work on Claude ([39] dataconomy.com) indicates substantial scaling ambitions. Even if the absolute percentages remain small initially, any marginal gains are valuable in a trillion-dollar industry.
- Adoption: Partnerships with industry leaders (Sanofi, Novo Nordisk, Genmab, 10x, Schrödinger, Komodo, etc. see *Table 9*) demonstrate that Claude Code fits pressing needs across the pharmaceutical and biotech value chain (rewire.it) (<sup>[14]</sup> www.biospace.com). Customer testimonials highlight productivity boosts and "new standards" of document automation (<sup>[47]</sup> www.claude.com) (<sup>[29]</sup> www.anthropic.com), further attesting to perceived utility.

In sum, both hard metrics (model scores, tokens processed) and business indicators (corporate usage, revenue, testimonials) point to significant productivity and capability improvements when Claude Code is applied to life sciences tasks.

# **Case Studies and Real-World Examples**

Below are brief case studies illustrating institutional deployment of Claude Code in life sciences:

- 1. Schrödinger (Computational Chemistry) Schrödinger's CTO describes Claude Code as a "powerful accelerator" in their software development ([30] www.claude.com). They used it to build platforms for drug design and reported turning ideas into code "in minutes instead of hours". For example, routine tasks like writing unit tests or APIs happened almost instantaneously. Internally, Claude Code contributed to Schrödinger's own research tools, demonstrating practical domain fit. The result was not only faster coding but also higher-quality outputs, since Claude suggested testing scenarios developers overlooked.
- 2. Axiom Bio (Drug Toxicity Prediction) A startup focusing on Al for preclinical safety, Axiom Bio integrates Claude Code agents into its pipeline. Claude helps query large biochemical and clinical datasets, and extract features for toxicity models ([31] www.anthropic.com). Axiom reports running billions of prompt tokens through Claude Code PRs to identify the most predictive features. They have also built custom MCP connectors to internal databases, enabling autonomous agent workflows. This has helped them shorten drug safety assessment cycles and accelerate feature selection for ML models.



- 3. **10x Genomics (Biotech Platform)** Through the partnership announced in Oct 2025, 10x Genomics scientists can now ask Claude to analyze single-cell data conversationally (<sup>[14]</sup> www.biospace.com). In field tests, non-computational biologists successfully ran standard 10x analysis tasks (cell-type clustering, marker identification) by typing questions into Claude. This real-world use-case shows democratization: labs without genomics experts gain instant capabilities. 10x characterizes this as lowering "technical barriers" and enabling focus on biological discovery (<sup>[42]</sup> www.biospace.com).
- 4. Novo Nordisk (Pharmaceutical) Novo Nordisk piloted Claude to automate content creation in drug development. R&D teams used it to draft Investigator Brochures, compiling clinical data from earlier trials into submission-ready text. The company's SVP of Data and AI says Claude "pull [s] from clinical data sources and create [s] GxP-compliant outputs," significantly speeding up document preparation while maintaining compliance ([25] www.anthropic.com) ([33] www.anthropic.com). Though details are still emerging, this use case exemplifies AI in a heavily regulated context with Claude handling routine text and formatting tasks and experts reviewing final content.
- 5. Sanofi (Pharma Corp) Sanofi has embedded Claude into a global "Concierge" app for its employees ([35] www.claude.com). The Claude-backed system answers questions by retrieving from Sanofi's vast internal knowledge bases. For example, a researcher can ask about past trial results or standard protocols and get instant summarized answers. Sanofi reports that most relevant staff now use this app daily. The Claude Code contribution here is in coding the backend RAG system: Claude writes database query code and UI components on the fly. This drastically cuts internal info-seeking time, supporting agile decision-making in drug pipelines.
- 6. Komodo Health (Healthcare Analytics) Komodo integrated Claude into healthcare data analysis. Their teams used Claude Code to build analytics agents that digest patient cohorts and outputs insights in minutes instead of laborious weekly analysis cycles ([48] www.anthropic.com). Claude writes scripts to clean claims data, joins it to disease severity metrics, and identifies risk patterns tasks that formerly required full days by a data scientist. Komodo highlights that Claude's code quality and speed have transformed their workflow, enabling more exploratory analyses historically deemed too slow.

Each case demonstrates a different aspect of Claude Code's value proposition: from core bioinformatics (10x, Schrödinger) to document automation (Novo, Sanofi) to knowledge systems (Sanofi, Komodo). The common thread is that Claude Code handles repetitive or complex coding/text tasks so researchers can focus on insights rather than implementation. These success stories underscore pragmatic benefits: real teams have turned to Claude not as a toy, but as an integrated collaborator.

# **Challenges, Risks, and Limitations**

While promising, deploying Claude Code in life sciences also faces significant obstacles:

- Hallucination and Accuracy: Even a 0.5% hallucination rate can be dangerous in science. As Rewire comments, a model must be not just "plausible" but precisely correct in lab contexts (rewire.it). LLMs can still produce fabricated references or flawed logic. For example, a recent incident found Claude's code interpreter could be coaxed into giving out false data ([49] www.techradar.com). In regulated fields, any mistake (wrong dosage, erroneous interpretation) could have severe consequences. Thus, outputs must be rigorously checked. Claude's documentation emphasizes giving references and verifying with domain experts, but the reliance on LLM "confidence" remains a risk.
- Data Privacy and Security: Life sciences data are often sensitive (patient data, proprietary assays). Running this data through an external AI requires trust. The discovered tech vulnerabilities in Claude Code's execution environment are worrisome: one study showed 30MB of data exfiltration via a malicious prompt ([49] www.techradar.com). Anthropic has since hardened this, but it highlights that any cloud-based AI with internet access must be carefully sandboxed. Enterprises must implement strict controls (limiting network calls, using private instances, etc.) before using Claude for confidential data.

- Regulatory and Validation: Producing "compliant" outputs is non-trivial. While Claude can format documents to meet guidelines, regulators will require evidence of version control, reproducibility, and human oversight. Some partners (Genmab) are exploring GxP-compliant pipelines ([33] www.anthropic.com), but it's an open question whether Algenerated content can fully pass quality audits. Auditing underlying code (and the data it was trained on) is another issue: transparency of LLM "reasoning" is limited, making validation difficult.
- Dependence on Fixed Knowledge: LLMs have a knowledge cutoff (unless connected to live sources). Claude Code must rely on piped data or updated embeddings. For fast-moving research areas (e.g. Covid variants), this could be a limitation. However, Claude's connectors mitigate this by accessing up-to-date databases (PubMed, internal data lakes), so hopefully answers reflect current evidence. Still, any Al answer carries the risk of being outdated.
- Equity and Bias: Life science research values diversity of thought. If teams rely too heavily on a single Al's suggestions, there's a danger of homogenizing perspective or propagating biases present in training data. For example, if the AI is trained on predominantly Western research, it may under-represent findings from other regions. Care must be taken to use Claude as an assistant, not a silo.
- Skill and Resource Gaps: To fully exploit Claude Code, organizations need both domain expertise and some software-savvy staff. Non-technical scientists can use connectors like 10x Genomics, but lesser-known tasks may still require crafting custom skills in Python or R. There may be an initial overhead in training users and integrating Claude into pipelines, as many partners acknowledge the need for consultants (e.g. Deloitte, KPMG) to guide deployment ( $^{[50]}$  dataconomy.com) ( $^{[51]}$ siliconangle.com).
- Economic Displacement: The long-term implication of automating coding and analysis is that some traditional roles (Bioinformatician, R&D data clerk) may be redefined. While proponents emphasize augmentation (not replacement), the shift could lead organizations to restructure teams around idea-generation and oversight rather than routine data tasks. This has ethical and workforce implications (e.g. retraining genetic analysts to use Al instead of writing custom scripts).

These challenges are acknowledged both by Anthropic and external commentators. For example, SiliconANGLE quotes Anthropic's leader noting "we're here to make sure this transformation happens and that it's done responsibly" ([52] siliconangle.com). Similarly, Anthropic's safety work (e.g. classifiers to block misuse ([53] www.techradar.com)) aims to mitigate malicious use. For life sciences specifically, the expectation is that Claude outputs will be final-reviewed by experts, much like how traditional analytics outputs are validated. The integration of Claude Code must be accompanied by governance: version-control of prompts and outputs, audit trails, and fallbacks when Claude is unsure.

# **Future Directions and Implications**

Claude Code's entry into life sciences points to several future trends:

- Deeper Workflow Integration: We expect more connectors and skills. Already, Anthropic has plans to add clustering, celltype annotation, and other genomic tools as skills (rewire.it). Future releases may integrate with robotic lab equipment (e.g. query a robot directly to run experiments) or tie into electronic health records for clinical insights. The Model Context Protocol (MCP) framework means any platform with an API could become a connector; e.g. Scispot (LIMS+AI) or Veeva (clinical data). As Claude becomes more "embedded," it may operate semi-autonomously within R&D pipelines.
- Scale of Collaboration: Claude's collaborative agents (as in the Paper2Agent concept) suggest a future where reading a new publication automatically spawns a reusable software agent for that methodology. In turn, this could accelerate cumulative science, as labs share agent "packages" representing validated protocols.
- Specialized Scientific Models: Claude for life sciences is just the beginning. We may see Claude trained or fine-tuned on subdomains (e.g. Claude for Genomics, Claude for Clinical Trials) to further improve accuracy. The modular design implies Claude could integrate with any domain's knowledge base. Other AI players (OpenAI, Google, etc.) are likely to follow suit, raising competition but also driving faster innovation.



- Regulatory Evolution: As more research tasks use AI, regulators may develop guidelines for AI-assisted R&D output. For instance, the FDA might require labeling of Al-generated sections, or standards for validating AI in data analysis. Companies working on GxP compliance with Claude are already pioneering this path. If Claude proves reliable, we could see AI methods formally accepted in protocols, much like CMO (contract manufacturing org) guidelines or GMP procedures have evolved.
- Economic Shifts: The productivity gains from Claude Code in biotech could change the economics of R&D. Lower barriers might allow smaller labs to undertake projects that once needed big teams (e.g. small biotech startups doing internal genomics without dedicated bioinformaticians). Additionally, global collaboration could increase: a researcher in a developing country with Claude Code could access analysis capabilities previously only in elite labs.
- Interdisciplinary Convergence: Tools like Claude are blurring lines between bench science and computing. We may see more cross-training: young scientists learning to "prompt program" and older bioinformaticians acting as Al-trainers. The distinction between "software developer" and "data scientist" in biology may fade, as LLMs handle the coding aspects.

Overall, the trajectory is toward autonomous or independent Al agents solving substantive research problems. As one Anthropic partner put it, we are moving "from barriers to discovery" [[42] www.biospace.com). If fully realized, Claude Code could radically accelerate drug pipelines and scientific discovery timelines. However, this raises big-picture questions: Will we trust AI to discover phenomena previously hidden? Can we ensure oversight? And what becomes of the scientific method in a world where machines suggest the experiments? These philosophical and systemic questions will grow more pressing as the technology embeds.

## Conclusion

In summary, Claude Code offers life sciences organizations a powerful suite of Al-driven tools to automate coding, data analysis, literature review, and documentation tasks. By linking to core lab platforms (from Benchling to 10x Genomics) and by providing agentic coding abilities, Claude Code can transform weeks or months of work into hours or minutes (rewire.it) ([21] dataconomy.com). Case studies from biotech and pharma show early success - companies are already adopting Claude to speed drug discovery, improve regulatory processes, and democratize data analysis ([30] www.claude.com) ([14] www.biospace.com). Quantitative evidence (model benchmarks, speed metrics, revenue figures) backs these claims, indicating substantial productivity gains.

Yet, these advances come with caveats. Ensuring data security, meeting regulatory standards, and guarding against Al errors are crucial. Claude is not a panacea; its outputs require expert review and will not solve inherently complex tasks like clinical trial design or mechanistic science overnight ([54] dataconomy.com) ([38] siliconangle.com). Furthermore, broad adoption may raise ethical and workforce concerns that the community must address proactively.

Looking forward, Claude Code exemplifies how specialized AI can augment scientific work. In the near term, we expect expanding integrations, more domain-specific skills, and iterative improvements in model correctness. In the long run, Al tools like Claude may become as ubiquitous in labs as centrifuges and microscopes are today, reshaping the practice of biology and medicine. The industry's current momentum partnerships spanning pharma, academia, and startups - suggests that Claude Code (and its successors) will be a fixture in the life sciences R&D toolkit.

All statements above are supported by sources, including Anthropic's publications and announcements, industry press releases, and analyses of AI in healthcare ([2] www.anthropic.com) ([14] www.biospace.com) ([22] siliconangle.com) ([21] dataconomy.com) ([34] www.anthropic.com). The evidence indicates that Claude Code is not only technically capable but also practically valuable in life sciences - and we are at the start of a potentially transformative era in scientific research.

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Contact founder Adrien Laurent and team at https://intuitionlabs.ai/contact for a consultation.



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