# Google Cloud in Pharma: Transforming Drug Discovery, Trials, and Operations

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big-data machine-learning cloud-computing data-analytics regulatory-compliance
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# Google Cloud in Pharma: Transforming Drug Discovery, Trials, and Operations

Cloud computing is rapidly reshaping the pharmaceutical industry. Traditionally cautious about new IT paradigms, pharma companies are now accelerating cloud adoption to drive innovation and efficiency. According to a recent PwC survey, 40% of pharmaceutical and life sciences firms already run all operations in the cloud, and **an additional 55% plan to be fully cloud-operational within two years** (How cloud is transforming pharma survey: PwC). Yet overall cloud uptake in pharma (estimated at ~$4.8 billion in 2022) still lags behind other sectors, growing ~13% in 2023 (Why Are Pharmaceutical Companies Reluctant to Adopt Cloud Technologies?). The slow start reflects concerns around regulatory compliance, data security, and cultural inertia (Why Are Pharmaceutical Companies Reluctant to Adopt Cloud Technologies?). But the tide is turning – especially in the U.S. – as pharma giants partner with cloud providers to modernize R&D, streamline clinical trials, and improve manufacturing and analytics. This article explores how **Google Cloud Platform (GCP)**, in particular, is being leveraged by U.S.-based pharmaceutical leaders for data-driven drug discovery, smarter trials, and compliant operations. We'll dive into which pharma companies use GCP (and for what), highlight key Google Cloud services (BigQuery, Vertex AI, Apigee, etc.) powering these use cases, and compare GCP's role vs. AWS and Azure in this industry.

## Big Pharma's Shift to Google Cloud

Large U.S. pharmaceutical companies are increasingly teaming with Google Cloud as part of their digital transformation. **Accenture's "Intient" platform** – an open architecture life sciences suite now exclusively on GCP – counts **top-25 pharmas like GlaxoSmithKline (GSK), Pfizer, and Bayer** among its clients (Accenture, Google hope to lure Big Pharma clients GSK, Pfizer and more to new data platform - Fierce Pharma). The goal of Intient on Google Cloud is to modernize drug discovery, development, and delivery by combining Accenture's industry expertise with Google's data analytics and AI capabilities (Accenture, Google hope to lure Big Pharma clients GSK, Pfizer and more to new data platform - Fierce Pharma). Early results show drastic productivity gains, with certain research tasks reduced "from weeks to minutes" through cloud-based data analytics and AI (Accenture, Google hope to lure Big Pharma clients GSK, Pfizer and more to new data platform - Fierce Pharma). This collaboration underscores how pharma giants are turning to GCP for **end-to-end data integration across research, clinical development, and commercialization**.

Other big players are forging direct partnerships. In 2019, **Sanofi** (a French pharma with major U.S. operations) launched a virtual innovation lab with Google, aiming to merge **Sanofi's rich datasets with Google's analytics and AI** expertise (Sanofi, Google team up in search of new

treatments, marketing solutions - Fierce Pharma). This lab works on both scientific projects (e.g. discovering new therapeutic approaches) and commercial improvements (personalized treatments and better patient engagement) (Sanofi, Google team up in search of new treatments, marketing solutions - Fierce Pharma). Sanofi also committed to **migrating parts of its business to Google Cloud to cut IT costs**, while applying AI to forecast sales and optimize supply chains (Sanofi, Google team up in search of new treatments, marketing solutions - Fierce Pharma) (Sanofi, Google team up in search of new treatments, marketing solutions - Fierce Pharma). Similarly, **Moderna** – the Boston-based mRNA pioneer – embraced a **multi-cloud data strategy leveraging Google Cloud** for critical analytics. Moderna's Vice President of Data Science notes that they choose "best-of-breed" tools for each job, and GCP was selected to integrate data and enable self-service analytics across the company (Moderna Case Study - Google Cloud) (Moderna Case Study - Google Cloud). Notably, **Moderna used Google Cloud and Looker to unify internal and external data for a holistic view of its clinical trials**, improving scientists' access to insights in real-time (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog) (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog). By centralizing trial data on Google Cloud, Moderna **reduced manual data wrangling, increased collaboration, and ensured high-quality trial monitoring** (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog) (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog). These cases illustrate a common theme: large pharmas are leveraging GCP's cloud data platforms to break down silos and make faster decisions – whether in R&D, clinical operations, or business processes.

## Data Analytics and Integration with BigQuery & Looker

One of Google Cloud's strongest appeals in pharma is its **powerful data analytics ecosystem**, including the BigQuery data warehouse and tools like Looker for business intelligence. Pharma companies deal with massive datasets: clinical trial results, real-world patient outcomes, genomics, supply chain logs, etc. GCP's serverless analytics (BigQuery, Dataflow, etc.) can handle these volumes with ease and compliance. The **Moderna** case is a prime example – they integrated diverse trial data sources into BigQuery and used **Looker for interactive analysis**, enabling researchers to get a **"more complete view" of trial progress and patient subpopulations in seconds rather than days** (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog). By connecting previously siloed data (e.g. different trial sites, lab results, CRO data) on a central platform, Moderna **improved data consistency and eliminated conflicting Excel reports** that had plagued their analysts (Moderna Case Study - Google Cloud) (Moderna Case Study - Google Cloud). Scientists now spend more time on science instead of manual data cleanup, and trial monitors can make **real-time decisions to ensure quality and safety** in ongoing studies (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog). This showcases how BigQuery's

scalability and Looker's user-friendly analytics can dramatically enhance clinical data management for pharma.

Beyond trials, pharma IT teams are also using BigQuery for **commercial and real-world data analysis**. For instance, companies can aggregate prescription data, insurance claims, and electronic health records to derive insights on treatment effectiveness or market performance – all while ensuring patient data is de-identified and secure. Google's Cloud Healthcare API (with support for HL7 FHIR and HIPAA compliance) can ingest clinical data into BigQuery, making it easier to integrate healthcare datasets for pharma research. **Vertex AI**, Google's managed machine learning platform, often works hand-in-hand with BigQuery by training models on these large datasets (e.g. predicting patient outcomes or optimizing trial design). In one case, **BioCorteX** – a techbio startup – built a knowledge graph of drug-bacteria interactions on BigQuery to predict **"Will this drug work?"** in specific microbiome contexts (How BigQuery helps BioCorteX with clinical trials - Google Cloud Blog - Rimah Harb) (How BigQuery helps BioCorteX with clinical trials - Google Cloud Blog - Rimah Harb). They rely on GCP's scalable storage and query engine to update this graph daily with new findings, accelerating insight generation for clinical decision support (How BigQuery helps BioCorteX with clinical trials - Google Cloud Blog - Rimah Harb). While BioCorteX is a smaller player, the same BigQuery-driven approach is being adopted by larger pharmas to power **real-world evidence (RWE) platforms** and more data-driven medicine development.

## Accelerating Drug Discovery with AI and HPC

Perhaps the most exciting area for GCP in pharma is **AI-powered drug discovery**. Google Cloud's prowess in machine learning (with **Vertex AI** and **TPU** hardware accelerators) is helping pharma researchers drastically speed up the discovery of new therapeutics. A flagship example is **Bayer's collaboration with Google Cloud to run quantum chemistry simulations on TPUs**. Announced in January 2023, this partnership applies Google's Tensor Processing Units – custom ML chips in GCP – to **scale up Bayer's quantum chemistry calculations for early drug discovery** (Bayer to accelerate drug discovery with Google Cloud's high-performance compute power). By running advanced simulations of molecular interactions (like **density functional theory calculations of protein-ligand binding**), Bayer aims to achieve fully in silico modeling of candidate drugs with high accuracy (Bayer to accelerate drug discovery with Google Cloud's high-performance compute power). In essence, GCP's high-performance computing allows Bayer's scientists to explore chemical space much faster than traditional methods. As Bayer's Chief Information & Digital Officer noted, **TPU-powered quantum chemistry could be a "disruptive technology" that helps identify novel drug candidates quicker** (Bayer to accelerate drug discovery with Google Cloud's high-performance compute power). Google Cloud's CEO likewise highlighted that *accelerating drug discovery is one of the most important applications of AI and HPC in healthcare*, and bringing together Bayer's R&D expertise with Google's infrastructure can get medicines to patients faster (Bayer to accelerate drug discovery with Google Cloud's high-performance compute power).

(Recursion Pharmaceuticals Case Study - Google Cloud) *Example of an AI-driven drug discovery pipeline using Google Cloud services (source: Recursion Pharmaceuticals). Data from high-throughput experiments is stored in Google Cloud Storage and processed through containerized pipelines on GKE (Google Kubernetes Engine) with TensorFlow.* ***Google's TPUs*** *are used to train deep learning models on massive image datasets, with results stored and analyzed in BigQuery and Cloud SQL. This scalable GCP pipeline enabled Recursion to discover new drug candidates in a fraction of the usual time (Recursion Pharmaceuticals Case Study - Google Cloud) (Recursion Pharmaceuticals Case Study - Google Cloud).*

Another trailblazer is **Recursion Pharmaceuticals**, a U.S.-based biotech that has built its entire drug discovery platform on Google Cloud. Recursion is creating an **"AI-enabled map of human biology"** to find treatments for rare diseases, combining automated lab experiments with cloud-scale analysis (Recursion Pharmaceuticals Case Study - Google Cloud). They generate terabytes of cellular microscopy images and use deep learning to detect how different molecules affect cells. With Google Cloud, Recursion can **burst to trillions of computations per second** when needed (Recursion Pharmaceuticals Case Study - Google Cloud). They leverage **GKE (Google Kubernetes Engine)** both in the cloud and on-premises to seamlessly integrate their lab systems with cloud pipelines (Recursion Pharmaceuticals Case Study - Google Cloud). Crucially, Recursion uses Google's **TPUs to accelerate image analysis and model training**, cutting processes that once took hours down to minutes (Recursion Pharmaceuticals Case Study - Google Cloud). This has led to tangible R&D wins: in under two years, Recursion built hundreds of disease models and even **advanced a new drug candidate into a Phase I trial – one of the first AI-discovered drugs to reach human testing** (Recursion Pharmaceuticals Case Study - Google Cloud). Their ambitious goal is to **discover 100 new clinical candidates in the company's first 10 years**, vastly outpacing traditional pharma pipelines (Recursion Pharmaceuticals Case Study - Google Cloud). Recursion's cloud-native approach demonstrates how GCP's AI tools (TensorFlow, Vertex AI) and scalable compute can shrink drug discovery timelines by an order of magnitude.

Google Cloud is directly enhancing these AI capabilities with specialized solutions for pharma. In 2023, Google introduced two AI suites for drug R&D – the **Target and Lead Identification Suite** (for protein structure and function prediction, built on DeepMind's AlphaFold2) and the **Multiomics Suite** (for genomics and multi-omics data integration) (Google lanza soluciones IA para la investigación de fármacos) (Google lanza soluciones IA para la investigación de fármacos). Notably, **early adopters of these GCP generative AI tools include Pfizer, Cerevel, and Colossal Biosciences**, who are using GCP's **high-performance computing and AI to predict protein 3D structures in a short time** (Google lanza soluciones IA para la investigación de fármacos). For example, Pfizer's scientists can now leverage Google's cloud-based AlphaFold and machine learning models to rapidly evaluate target proteins and design new drug molecules – tasks that used to take months of lab work (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog) (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog). The **integration of AlphaFold2 with Vertex AI** has significantly decreased the time needed for protein engineering and de novo drug design, yielding optimized compute

usage and better experiment tracking (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog). During the COVID-19 pandemic, GCP also showcased its strength in collaborative HPC: **Google provided 16 million hours of free GPU time to Schrödinger (a computational chemistry company)**, which teamed up with Takeda, Novartis, and Gilead to virtually screen billions of molecules against coronavirus targets (Google Cloud is providing Schrödinger 16 million hours of GPU time for computational drug discovery in the fight against COVID-19 - Google Cloud Blog) (Google Cloud is providing Schrödinger 16 million hours of GPU time for computational drug discovery in the fight against COVID-19 - Google Cloud Blog). That amounted to **1,826 years of computing in a matter of months** for antiviral drug discovery (Google Cloud is providing Schrödinger 16 million hours of GPU time for computational drug discovery in the fight against COVID-19 - Google Cloud Blog). These examples underscore how GCP's advanced AI and HPC infrastructure is accelerating drug discovery – from crunching molecular simulations to powering cutting-edge generative AI models – for pharma organizations that embrace the cloud.

## Streamlining Clinical Trials and Healthcare Integration

Clinical development is another area where pharma companies are using Google Cloud to gain an edge. We saw how Moderna tapped GCP to integrate clinical trial data and enable real-time analytics. In addition, Google Cloud offers tools to **improve patient recruitment, engagement, and data capture in trials**. For instance, GCP's global network and analytics can help expand trial site coverage and monitor data centrally, **lowering enrollment cycle times and improving cross-site collaboration** (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog) (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog). Google Workspace and Apigee API management can be used to build secure investigator portals or patient apps that feed data directly into a trial database. **Compliance with stringent regulations (HIPAA, 21 CFR Part 11, GDPR, etc.) is built into Google's healthcare offerings** – the **Cloud Healthcare API** enables secure ingestion of medical records in formats like FHIR and DICOM, while maintaining audit logs and granular access controls (GxP - Compliance - Google Cloud) (Google Cloud GxP Compliance - USDM Life Sciences). This is critical for trials that might integrate electronic health record data or remote patient monitoring data.

Pharma companies are also leveraging GCP to integrate **real-world data and pharmacovigilance**. For example, a pharmacovigilance team could use **BigQuery to aggregate adverse event reports and real-world evidence** from various sources, then apply Vertex AI to detect safety signals (patterns of side effects) faster than manual review. The scale of Google's analytics means millions of data points (e.g. medical claims, patient registry data) can be queried in seconds, helping safety scientists identify risks or efficacy trends sooner. In the realm of precision medicine trials, GCP's ability to combine genomic data (via the Multiomics Suite) with clinical outcomes can help researchers identify genetic biomarkers that predict drug response

(Google lanza soluciones IA para la investigación de fármacos) (Google lanza soluciones IA para la investigación de fármacos).

Moreover, Google's cloud-based collaboration tools are improving how pharma works with external partners (CROs, research institutes, regulators). Through **secure APIs and data sharing platforms**, companies can grant controlled access to data sets or AI models without moving everything on-premises. For example, the **Broad Institute's Terra platform** (co-developed with Verily and Microsoft, but initially on GCP) allows researchers worldwide – including pharma R&D teams – to co-analyze large biomedical datasets in a compliant cloud environment. This kind of cloud-enabled collaboration was invaluable during COVID-19 vaccine development and is becoming the norm for large-scale trials and research consortiums.

## Enhancing Manufacturing, Supply Chain, and Compliance

In addition to R&D and trials, pharma IT leaders are moving manufacturing and supply chain operations onto Google Cloud to gain more agility. **Manufacturing execution systems (MES)** and IoT sensors in production lines can stream data to GCP in real time for analysis. With tools like **Cloud IoT Core (now part of Cloud Pub/Sub)** and BigQuery, companies can perform predictive analytics on factory data – for example, predicting equipment maintenance needs or analyzing production yield metrics across sites. **Sanofi's use of AI on GCP to forecast sales and optimize supply chain** is one concrete example (Sanofi, Google team up in search of new treatments, marketing solutions - Fierce Pharma) (Sanofi, Google team up in search of new treatments, marketing solutions - Fierce Pharma). By training demand forecasting models on sales, geographic, and logistics data, Sanofi hopes to improve the accuracy of production planning and inventory management. These cloud-based forecasts consider real-time information and constraints (like shipping or manufacturing lead times) to adjust plans dynamically (Sanofi, Google team up in search of new treatments, marketing solutions - Fierce Pharma). In a regulated industry, even small efficiency gains in the supply chain can translate to significant cost savings and better drug availability for patients.

Regulatory compliance and data security are paramount in all these operations – and GCP has made strides to assure pharma companies and regulators that cloud systems can be trusted. Google Cloud provides detailed guidance on building **GxP-compliant environments** on its platform ([PDF] Using Google Cloud in GxP Systems). For instance, GCP services can be qualified/validated for use in GMP manufacturing or GLP lab systems, with documentation to support FDA and EMA requirements (GxP - Compliance - Google Cloud) (Google Cloud GxP Compliance - USDM Life Sciences). Specialized partners like USDM Life Sciences work with Google to offer **continuous compliance solutions for GxP workloads on GCP** (Google Cloud GxP Compliance - USDM Life Sciences). This means pharma companies can run validated applications (e.g. for batch record management or lab data capture) in the cloud and maintain compliance via proper change control and qualification processes. Many firms are now convinced that **the cloud can be a GxP-compliant solution** as long as best practices are

followed (Why Are Pharmaceutical Companies Reluctant to Adopt Cloud Technologies?). In fact, those pharmas that have transitioned to cloud report benefits like **standardized processes across sites and faster innovation cycles, while meeting quality requirements** (Why Are Pharmaceutical Companies Reluctant to Adopt Cloud Technologies?).

Security is another area where Google Cloud is actively supporting pharma IT. The biopharma sector has been a major target for cyber threats (from IP theft to ransomware), especially during COVID. **Pfizer**, for example, faced a surge of attacks during its vaccine development. In response, Pfizer turned to **Google Cloud's Security Operations (Chronicle) platform** to bolster its defenses. According to Google, **Pfizer now leverages Cloud Security Operations to "stitch together all of its security technologies and protect all of its cloud assets and environments."** (What's New in Google SecOps today? - Page 2 - Google Cloud Community). By aggregating and analyzing security telemetry at Google's scale, Chronicle helps Pfizer detect threats across multi-cloud and on-prem systems in seconds. It provides an **AI-powered SIEM** (Security Information and Event Management) that can handle the massive data volumes of a global pharma and pinpoint anomalies that human analysts might miss. This move highlights that pharma companies not only trust Google for analytics, but also for mission-critical security and compliance tooling.

## API Management and Digital Health Innovation

Another key Google Cloud service seeing uptake in pharma is **Apigee API Management**. Pharma organizations are increasingly building digital products – from patient support mobile apps to connected devices (e.g. smart inhalers, insulin pumps) – that need to exchange data securely with cloud systems. Apigee provides a secure, scalable layer to manage all these APIs. A prime example is **BrightInsight**, a U.S.-based platform that many pharma and medtech companies use to host their regulated digital health apps. BrightInsight's platform, built on GCP, uses **Apigee to handle over 20 million API calls per day from FDA-regulated medical devices, combination products, and software apps** (BrightInsight Case Study - Google Cloud) (BrightInsight Case Study - Google Cloud). Apigee simplifies the complex mesh of APIs and microservices, providing **enterprise-grade security (OAuth2, encryption) and an average response time under 500ms** for each API call (BrightInsight Case Study - Google Cloud) (BrightInsight Case Study - Google Cloud). This allows, for example, a connected pill bottle or glucose sensor to transmit data to the cloud, where it's stored (Cloud Storage/BigQuery) and analyzed, and then an insight is sent via API to a patient's mobile app or doctor's dashboard. By **offloading API management to Apigee**, BrightInsight's small team could rapidly deploy globally compliant digital health solutions for pharma clients – instead of each pharma building their own backend. As BrightInsight's CTO put it, *"Having Apigee handle the APIs for us is key. Apigee allows us to offer a full feature set to our customers from day one."* (BrightInsight Case Study - Google Cloud). This example underscores how GCP enables **integration of healthcare IoT and software as a medical device** in a compliant manner. Pharma companies using BrightInsight or similar platforms can more quickly launch patient-

centric tools (like companion apps that track dosage adherence or report side effects) and **derive real-world data** to augment their product value propositions.

Apigee is also used internally by pharmas to modernize legacy systems. Many large pharma IT landscapes include decades-old systems (for ERP, lab management, etc.) that need to interface with newer cloud apps. By placing Apigee as an API gateway, companies create a unified interface for developers to access backend data, without exposing the old systems directly. This supports initiatives like creating a **single "data fabric" across R&D, manufacturing, and commercial units**, which is a goal of many digital transformation projects. GCP's **integration services** (Cloud Pub/Sub, Data Fusion, Workflows) complement Apigee to enable event-driven and batch data integration – for example, ingesting equipment sensor data into analytics, or synchronizing a cloud data lake with on-prem databases.

## GCP vs. AWS and Azure in the Pharma Cloud Race

How does Google Cloud stack up against its two main competitors in the pharma sector? **AWS (Amazon Web Services)** remains the market leader in cloud and is widely used across biotech and pharma. In fact, AWS is **often the default choice for biotech startups and is used by large pharmaceutical companies** as well (How to pick the right cloud provider for biomedical and life science companies - by Karl Sebby - Medium). Its early lead and breadth of services mean many developers and IT consultants are deeply familiar with AWS. Pharma companies like Moderna have relied on AWS for core infrastructure (Moderna named AWS its preferred cloud in 2020 for certain workloads (Amid vaccine race, Moderna taps AWS as preferred cloud vendor)), and other big players have long-standing engagements with AWS for scalable computing and storage. AWS has also developed life-science-specific offerings – for example, a Genomics CLI and blueprint solutions for multi-omics pipelines (How to pick the right cloud provider for biomedical and life science companies - by Karl Sebby - Medium) – to cater to research needs. This, combined with AWS's large partner ecosystem, makes it a strong incumbent especially for high-throughput sequencing data analysis, HPC workloads, and traditional enterprise IT in pharma.

**Microsoft Azure**, on the other hand, has gained traction particularly among big, established pharma companies that value its enterprise integration. Azure often appeals to **highly regulated organizations and those with a lot of Microsoft technology stack in-house** (How to pick the right cloud provider for biomedical and life science companies - by Karl Sebby - Medium). Pharma firms that are Windows/.NET shops or that want seamless integration with tools like Active Directory and Office 365 may lean toward Azure. Microsoft has struck notable pharma partnerships – a prime example being **Novartis's AI innovation lab with Azure**, a multi-year collaboration to apply Microsoft's AI across Novartis' drug development and manufacturing (Novartis and Microsoft announce collaboration to transform ...) (Microsoft Novartis AI Partnership Strategy for Cloud and AI Business). Azure's emphasis on hybrid cloud is also a draw: many pharma data centers run VMware or Windows Server, and Azure Arc/Azure Stack

allow a gradual, hybrid approach to cloud. For instance, a pharma can keep sensitive workloads on-premises but use Azure for burst computing or AI model training, all managed under one framework. Azure's focus on security and compliance is another selling point – it starts with more restricted default settings (which can feel "locked down" but appeals to compliance teams) (How to pick the right cloud provider for biomedical and life science companies - by Karl Sebby - Medium). Overall, Azure has positioned itself as the safe, enterprise-friendly cloud, and we see companies like **Merck, Johnson & Johnson, and AstraZeneca** using Azure for parts of their cloud portfolio (often alongside other clouds).

**Google Cloud**, relative to AWS and Azure, has a smaller overall market share but is making significant inroads in life sciences by leveraging its strengths in **data analytics, AI, and open collaboration**. One strategic move was Google's partnership with Accenture for the Intient platform, which effectively onboarded several big pharmas onto GCP via a domain-tailored solution (Accenture, Google hope to lure Big Pharma clients GSK, Pfizer and more to new data platform - Fierce Pharma). Another differentiator is Google's **leadership in AI** – pharmas interested in cutting-edge AI (e.g. image recognition, generative models, or advanced analytics like **AlphaFold for protein folding**) find GCP attractive. For example, **AstraZeneca** has been exploring AI for drug discovery with various partners; while they use multiple clouds, Google's AI offerings (like the Vertex AI platform and collaborations via Google's AI teams) can be a compelling reason to engage with GCP for specific projects. Google also tends to embrace **open-source technologies** (TensorFlow, Kubernetes, Apache Beam, etc.) which resonate with scientific computing communities and avoid vendor lock-in. This openness can be appealing to pharma IT architects who want flexibility and multi-cloud portability in the long run.

Many large pharma companies are not choosing one cloud over another, but rather adopting **multi-cloud strategies** to play to each provider's strengths. As noted, **Moderna is explicitly multi-cloud**, using AWS for some core data storage but GCP for analytics and BI, thereby "using and integrating the best tools for the job at hand" (Moderna Case Study - Google Cloud) (Moderna Case Study - Google Cloud). **Johnson & Johnson** likewise has a multi-cloud approach – they have publicly discussed using "the right cloud for the right workload" to drive innovation while managing risk (Johnson & Johnson's multicloud experience towards ... - YouTube). In multi-cloud setups, Google Cloud often serves as the analytics and machine learning hub, interfacing with transactional data stored in AWS or Azure. Tools like **Apigee and BigQuery Omni** (which can query data in other clouds) facilitate this interoperability. The **Intient platform** itself was designed with an open architecture on GCP to integrate many software vendors and even other clouds' data sources (Accenture, Google hope to lure Big Pharma clients GSK, Pfizer and more to new data platform - Fierce Pharma) (Accenture, Google hope to lure Big Pharma clients GSK, Pfizer and more to new data platform - Fierce Pharma). For pharma companies, this means they can run, say, an AI-driven analysis pipeline on GCP using data that might reside in an AWS S3 bucket or on-prem Oracle database – thus leveraging GCP's analytics without abandoning existing investments on other platforms.

In terms of **competitive landscape**, AWS still hosts a larger share of pharma cloud workloads (benefiting from being the first mover), and Azure's deep enterprise relationships have won it strategic deals in pharma (especially for corporate IT and collaboration services). However, Google Cloud is **rapidly growing its footprint in pharma R&D and analytics**. A recent analysis of cloud AI case studies noted that while AWS leads in overall market share, **Google's share of new AI/ML case studies (18%) is higher than its general cloud market share**, indicating outsized momentum in AI applications (Who is winning the cloud AI race? Microsoft vs. AWS vs. Google). The pharma industry, increasingly convinced of cloud value, is expected to utilize all three major clouds in various capacities. GCP's role is often that of the **"innovation cloud"** – the place to experiment with big data and AI, to run collaborative projects, and to tap into Google's unique technologies (from **TPUs and BigQuery to specialized APIs for healthcare**). As pharma companies race to shorten drug development cycles and derive more insight from data, Google Cloud's capabilities in handling large-scale data and providing off-the-shelf AI solutions position it as a key partner.

## Conclusion

In summary, Google Cloud Platform has emerged as a critical enabler for U.S. pharmaceutical companies aiming to become more data-driven and agile. From **drug discovery** (where GCP's AI and HPC help design molecules and identify targets faster) to **clinical trials** (where integrated cloud data platforms provide real-time insights and efficiency) to **manufacturing and compliance** (where IoT data and ML optimize operations under strict regulations), GCP is being leveraged in numerous ways across the pharma value chain. We see big pharmas like **Pfizer, Moderna, Sanofi, and Bayer** taking advantage of Google Cloud's offerings – often in combination with other clouds – to accelerate innovation while controlling costs and maintaining compliance. Popular GCP services in pharma include **BigQuery** for large-scale analytics, **Looker** for interactive data exploration, **Vertex AI** for building and deploying machine learning models, **TPU accelerators** for compute-intensive research, and **Apigee** for secure API management and system integration. Real-world partnerships and case studies illustrate these in action: **Intient on GCP** bringing AI to R&D at GSK and Pfizer (Accenture, Google hope to lure Big Pharma clients GSK, Pfizer and more to new data platform - Fierce Pharma), **Moderna's multi-cloud trial data hub** improving collaboration (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog), **Bayer's TPU-powered quantum chemistry** speeding up lead discovery (Bayer to accelerate drug discovery with Google Cloud's high-performance compute power), **Recursion's cloud AI platform** yielding new treatments in record time (Recursion Pharmaceuticals Case Study - Google Cloud), and **BrightInsight+Apigee** enabling compliant digital health solutions with ease (BrightInsight Case Study - Google Cloud) (BrightInsight Case Study - Google Cloud).

Looking ahead, as pharmaceutical companies continue to embrace cloud-first or hybrid-cloud strategies, Google Cloud is poised to play an even larger role. Its ongoing investments in **healthcare-specific AI (e.g. AlphaFold, genomics, healthcare NLP)** and **industry**

**partnerships (Accenture, Deloitte, Epic, etc.)** are likely to expand the toolkit available to pharma IT and data teams. The competitive dynamic with AWS and Azure will push all providers to address pharma's needs for better data governance, cost efficiency, and validated solutions. For IT professionals in pharma, the key is understanding each cloud's strengths: AWS for its mature ecosystem and breadth, Azure for enterprise integration, and **GCP for cutting-edge data science and open innovation**. With the right architecture (often a multi-cloud one), pharma companies can leverage GCP's unique capabilities while interoperating with other platforms – achieving a balance of innovation, compliance, and reliability. The end result is a tech infrastructure that empowers researchers and operations teams to deliver new therapies to patients faster and more efficiently than ever before, fulfilling the promise of digital transformation in healthcare.

**Sources:**

- Accenture and Google Cloud exclusive partnership for the Intient pharma platform – top pharmas (GSK, Pfizer, Bayer) among initial users (Accenture, Google hope to lure Big Pharma clients GSK, Pfizer and more to new data platform - Fierce Pharma).
- Sanofi–Google partnership (2019) to create a digital innovation lab, apply AI in R&D and supply chain, and migrate business workloads to GCP (Sanofi, Google team up in search of new treatments, marketing solutions - Fierce Pharma) (Sanofi, Google team up in search of new treatments, marketing solutions - Fierce Pharma).
- PwC Cloud Business Survey – 40% of pharma/life sciences firms fully on cloud, additional 55% planning to be in two years (How cloud is transforming pharma survey: PwC). Cloud adoption in pharma valued at $4.8B in 2022, ~13% growth in 2023 (lagging other sectors) (Why Are Pharmaceutical Companies Reluctant to Adopt Cloud Technologies?).
- Moderna case study – adopted Google Cloud and Looker for multi-cloud data integration, yielding a complete view of clinical trials, higher efficiency, and real-time decision making (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog) (Reduce cost, increase speed of drug development with cloud - Google Cloud Blog).
- Bayer collaboration with Google – using Cloud **TPUs** to accelerate quantum chemistry simulations for drug discovery (protein–ligand modeling) (Bayer to accelerate drug discovery with Google Cloud's high-performance compute power) (Bayer to accelerate drug discovery with Google Cloud's high-performance compute power).
- Recursion case study – uses GCP (TPUs, TensorFlow, GKE) to process cellular images and train deep learning models; achieved one of the first ML-identified drugs to reach clinical trials (Recursion Pharmaceuticals Case Study - Google Cloud) (Recursion Pharmaceuticals Case Study - Google Cloud).
- Google Cloud's AI suites (Target & Lead Identification, Multiomics) – launched 2023; early users **Pfizer, Cerevel, Colossal Biosciences** use GCP's generative AI to predict protein structures and accelerate discovery (Google lanza soluciones IA para la investigación de fármacos).

- BrightInsight case study – built a regulated digital health platform on GCP; **Apigee** manages ~20 million API calls/day from pharma devices/apps with <0.5s latency, ensuring security and compliance (BrightInsight Case Study - Google Cloud) (BrightInsight Case Study - Google Cloud).
- Pfizer security transformation – Pfizer leverages **Google Cloud Security Operations (Chronicle)** to unify and protect all its cloud environments, strengthening cyber defense in the pharma landscape (What's New in Google SecOps today? - Page 2 - Google Cloud Community).
- "AWS is often the default choice for biotech startups and used by large pharmaceutical companies" – reflecting AWS's dominance and familiarity in life sciences (How to pick the right cloud provider for biomedical and life science companies - by Karl Sebby - Medium). Azure tends to serve big, highly regulated enterprises (pharma, healthcare) focusing on integration and security (How to pick the right cloud provider for biomedical and life science companies - by Karl Sebby - Medium) (How to pick the right cloud provider for biomedical and life science companies - by Karl Sebby - Medium).

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