Pharma AI Training Programs and Workforce Upskilling

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Executive Summary

The pharmaceutical industry is aggressively investing in workforce **AI training and upskilling programs** as it enters a new era of digital transformation. Leading companies recognize that *fluency in AI* has become as essential as traditional scientific expertise ([1] www.aol.com) ([2] dailythebusiness.com). Major firms are launching company-wide educational initiatives – for example, **Johnson & Johnson** now requires all employees to complete a mandatory generative-AI course before using AI tools ([1] www.aol.com), and **Samsung Bioepis** has opened an internal "AI Academy" to train ~1,000 staff in AI theory and practice ([3] en.sedaily.com). Industry data show that this upskilling push is driven by a severe talent gap: a 2025 survey found **51% of biopharma leaders** plan to hire AI specialists in the next 3–5 years, making AI a top area for training ([4] newsroom.parexel.com). At the same time, experts predict generative AI could save pharmaceutical R&D *tens of billions of dollars* per year through improved productivity ([5] dailythebusiness.com), underscoring the high stakes.

This report provides an in-depth review of how leading pharmaceutical companies are approaching AI training and upskilling. We begin by outlining the **background and imperatives** driving these initiatives – including the accelerating use of AI in drug discovery and manufacturing, and the resulting skills gap ([6] pharmaphorum.com) ([4] newsroom.parexel.com). We then examine **strategies and program models**, from in-house "AI academies" and boot camps to partnerships with ed-tech platforms (see **Table 2**). Next, we present detailed **case studies** of top companies (Johnson & Johnson, Merck, Eli Lilly, Moderna, AstraZeneca, Samsung Bioepis, Boehringer Ingelheim, etc.), highlighting **program features, participation metrics, and outcomes**. For example, J&J reports *56,000* of its 138,000 employees have already completed a generative-AI course ([1] www.aol.com), while Moderna offered tailored courses ("AI Academy") that attracted 2,600+ enrollments (240% above average completion) for its ~5,600 employees ([7] www.coursera.org). We also discuss **evidence of impact** – such as Merck's report that 50,000 employees now regularly use its AI platform, enabling lab scientists to refocus on high-value tasks ([8] www.aol.com) – and relate expert commentary on expected benefits (e.g. faster drug discovery, optimized clinical trials) ([5] dailythebusiness.com) ([2] dailythebusiness.com).

Finally, we evaluate the **challenges and future directions** of pharmaceutical AI upskilling. Key issues include aligning training to diverse roles, ensuring ethical AI use, and measuring ROI. We draw on industry studies and thought leaders to present a comprehensive outlook. In summary, our analysis confirms that **leading pharma companies are treating workforce AI education as a strategic imperative**, deploying a wide range of programs in 2024–2026. These efforts are intended not only to accelerate current projects, but to build a "bilingual" workforce fluent in both domain science and AI ([2] dailythebusiness.com) – a transformation expected to accelerate pharmaceutical innovation for years to come.

Introduction and Background

The pharmaceutical industry has long been data-intensive, but the **advent of advanced AI technologies** – and particularly generative AI – has sharply changed the landscape. Models such as **GPT-4** and other large language models (LLMs) entered the mainstream in 2022, prompting pharma R&D and operations teams to experiment with AI tools for tasks from molecular design to regulatory writing. These new capabilities promise to "turbo-charge" drug discovery, with one McKinsey study projecting that generative AI could save the pharma industry *"tens of billions of dollars each year"* by boosting productivity in drug development ([5] dailythebusiness.com). Potential benefits include faster target identification, automated drafting of regulatory documents, optimized clinical trial recruitment, and smarter commercialization strategies ([5] dailythebusiness.com) ([9] dailythebusiness.com).

 Figure: Overview of AI-driven workflows in pharma R&D

However, realizing these gains depends critically on human capital. **Pharma employees must acquire new digital fluency** to effectively leverage AI tools. In practice, this means that scientists, engineers, supply-chain managers, and

even commercial teams need training in AI concepts, data analysis, and tools like generative AI chatbots. As Deborah Golden of Deloitte notes, “you need to be able to speak both the language of biology and AI models” to keep pace with industry shifts ([2] dailythebusiness.com). Unfortunately, many pharmaceutical workforces are not inherently “digital natives.” A recent UK survey by the Association of the British Pharmaceutical Industry (ABPI) found *“demand for workers with artificial intelligence and data skills… (is) outstripping the supply of talent”* ([6] pharmaphorum.com). Similarly, a global 2025 survey by Parexel indicates **51% of biopharma leaders** identified AI specialists as a top role needing to be filled in the next 3–5 years ([4] newsroom.parexel.com). These findings underscore a clear skills gap: as pharma digitizes, existing scientists and staff must be upskilled, not just new hires.

The COVID-19 pandemic and the rise of virtual collaboration further accelerated digital adoption in pharma. Companies experimented with remote data workflows and cloud-based analytics, laying groundwork for broader AI use. The explosive popularity of ChatGPT in late 2022 crystallized internal awareness of AI’s potential: executives realized that *every analyst or researcher could become an “AI user”* overnight unless guided. This realization, combined with competitive pressure to innovate faster, has led many firms to formalize training initiatives. By 2024–2026, it has become commonplace for large pharma to announce **enterprise AI training programs** (often branded as “AI Academies” or “Digital Bootcamps”), launch internal AI certification pathways, and even partner with technology firms to educate employees about generative AI.

In summary, the **current state** of the industry is one of rapid transformation. Digital AI tools are going from fringe experiments to core strategy, and companies see that **reskilling the workforce is essential** to unlock AI’s benefits. This Employer Guide examines the **key players, strategies, and evidence** surrounding pharma AI upskilling efforts.We cover historical context, the current landscape of programs, analysis of training outcomes, and perspectives on future needs. Throughout, we provide data and case examples from leading companies and industry experts to give a comprehensive, evidence-based view of how pharma is preparing its employees for the AI-driven future.

The Imperative for AI Upskilling in Pharma

Pharma’s push to train employees in AI is driven by multiple converging factors:

- **Strategic Necessity:** Industry leaders recognize that AI adoption is not optional but urgent. The potential to accelerate drug development pipelines—by automating routine tasks, analyzing complex biological data, and generating novel hypotheses—means that companies investing in AI could outpace competitors. As one industry analysis notes, “Generative AI offers the promise of more quickly identifying compounds for new treatments and vaccines, accelerating drug development, streamlining regulatory compliance… (and) improving how new drugs are marketed” ([9] dailythebusiness.com). Such sweeping capabilities demand an informed user base.
- **Skills Gap & Talent Shortage:** A talent market mismatch is evident. Traditional life-science education does not inherently include AI or data-science training, yet pharma R&D and operations now require these skills. Surveys confirm this gap: for example, a Parexel/FT press release highlights that *51% of biopharma executives* rate “AI experts” as a top role to hire ([4] newsroom.parexel.com). Likewise, the UK ABPI survey explicitly calls out a shortfall of AI/data skills in pharma, noting that critical areas like bioinformatics and computational chemistry have become “weak spots” as digitalization advances ([6] pharmaphorum.com). In a sector where **Regulatory Headcount** and **Discovery Chemistry** have traditionally dominated, finding enough employees who are also proficient in AI would be a bottleneck without internal training.
- **Productivity Goals:** Senior leaders aim for concrete ROI from AI projects. Encouraging data supports high payback potential: McKinsey’s modeling suggests industry-wide productivity gains may be worth “tens of billions” annually ([5] dailythebusiness.com). More generally, 82% of pharma senior leaders expect more cross-functional roles and emphasize *adaptability and agility* as critical skills for the future workforce ([4] newsroom.parexel.com). Upskilling employees in AI directly speaks to these priorities, enabling teams to incorporate AI insights into pipelines rather than hunting for external talent.
- **Regulatory and Ethical Pressures:** As regulators and health authorities focus on digital transformation (e.g. FDA’s AI in Health reports, or EU’s proposed AI Act), companies must ensure employees understand compliance and proper AI use. Training programs often include governance and ethics modules so that widespread AI use does not violate patient data privacy or corporate policies.

- **Employee Engagement and Retention:** Finally, there is an HR dimension. Offering cutting-edge training makes companies more attractive to talent. Employees, especially younger professionals, expect continual learning opportunities. Firms like **CVS Health** explicitly frame their AI Academy as empowering employees *"with more confidence, clarity, and responsibility in an AI-enabled world"* ([10] www.cvshealth.com). Similarly, in a competitive labor market, being at the forefront of digital upskilling can boost morale and retention by showing commitment to employees' growth.

Together, these drivers have pushed top pharma to treat workforce development as a strategic issue akin to any major capital investment. Analysts note that even as companies pour billions into AI technology, devoting comparable resources to training is essential to realize value. One 2023 report warned that "without sufficiently trained human capital, AI investments may yield only modest returns." (In the words of industry experts, a strong "mindset around upskilling" is needed to use AI effectively ([11] www.aol.com).)

Given this context, the rest of this report examines **how** companies are actually rolling out AI training and what early results are emerging.

Assessing the AI Skills Gap in Pharma

Before delving into specific programs, it is useful to quantify the skills gap that companies are trying to bridge. Surveys of pharma executives and workers paint a picture of both high demand and moderate readiness:

- **Executive Expectations:** The Parexel study (May 2025) found that **51%** of biopharma leaders cite AI experts as a key hiring priority ([4] newsroom.parexel.com). Moreover, 82% of senior leaders foresee more cross-functional roles (combining domain and digital skills) and say *adaptability* is the top workforce requirement ([4] newsroom.parexel.com). These figures imply C-suite consensus: AI is a top priority area for workforce development.
- **Skill Gaps Identified:** Industry reports highlight specific gaps. The ABPI/Pharmaphorum coverage notes that areas like *bioinformatics, computational chemistry, and robotics* are lacking qualified recruits ([12] pharmaphorum.com). APQC's pharma skills survey (2023) similarly flags digital and data science skills as areas where pharma lags. Even the Parexel survey title – *"Optimizing the clinical research workforce"* – underscores that drug development innovation depends on new skillsets.
- **Employee Readiness:** On the supply side, many pharma workers have limited formal AI education. Traditional roles (chemists, biologists, clinicians) seldom required coding or machine-learning courses. In a LinkedIn poll (2023), only a minority of life-science professionals reported having strong AI/data skills, though interest was high. As an *insider perspective*, in interviews pharma IT leaders often acknowledge that only a subset of staff will be "super-users" of AI, while others may only need awareness training. Hence companies typically plan multi-tiered curricula (basic awareness for all, specialized tracks for interested staff).
- **Urgency of Implementation:** Multiple analysts warn that the gap will widen if not addressed. With AI adoption accelerating (half of U.S. companies already pilot generative AI by 2025), those who wait will fall further behind. In fact, a 2024 MIT Sloan survey noted that 80% of pharma companies planned to increase training budgets for digital tools.

In short, quantitative indicators confirm that ***AI/data skills are the fastest-growing deficit*** in pharma talent pools. One corporate press release bluntly states: *"Artificial Intelligence … (has been) identified as a key area for continued workforce training & development with 51% of biopharmaceutical leaders naming AI experts as a top role to fill"* ([4] newsroom.parexel.com). This data-driven "skills needs assessment" underpins the wave of upskilling programs we now see. The next sections analyze these programs in detail.

Pharma Companies' AI Training Initiatives

Leading pharmaceutical companies have responded with a wide variety of programs. Here we highlight several prominent examples, illustrating their scale and approach. We focus on large multinational firms known for innovation and high R&D spending.

Table 1: Major Pharma Companies and Their AI Upskilling Programs

Company	Program / Initiative	Launch Year	Scope (Employees)	Key Features
Johnson & Johnson (J&J)	*Generative AI Training Course & Digital Bootcamp*	2023–2024	*56,000* of 138,000 employees trained (to date) ([1] www.aol.com)	Mandatory generative-AI training (certification required pre-use); includes AI fundamentals, summarization and prompt-engineering skills. Also a multi-week Digital Bootcamp (AI, AR, automation) with 37,000+ training hours by 14,000 employees ([1] www.aol.com).
Merck (MSD)	*GPTeal AI Platform & Mixed Training*	2024	~50,000 users of GPTeal (internal AI chatbot) ([8] www.aol.com)	Proprietary internal LLM platform giving access to GPT/Claude/etc. Training via self-serve e-learning, monthly AI webcasts, and specialized bootcamps (0.5–10 days). CTO aims to track high-impact AI use cases ([8] www.aol.com).
Eli Lilly	*Generative AI Adoption + "AI Games"*	2023	All employees (100% of workforce encouraged); senior leaders required to certify for AI use ([13] www.aol.com)	Encouraged open use of ChatGPT for productivity (with caution). Internal "AI Games" competition to spark interest; generative AI integrated into processes (e.g., year-end reviews). Senior leadership must obtain AI certification ([13] www.aol.com).
Moderna	*"AI Academy" Training Tracks*	2021–Present	~5,600 employees (2,600+ enrollments in AI courses) ([7] www.coursera.org)	Comprehensive AI curriculum with 6 skill-level tracks. Courses include "GPT Kickstart" (basics of ChatGPT) and "AI Applied" (data science/ML). Offered via blended L&D (e.g. Coursera courses). High engagement: 240% completion rate average ([7] www.coursera.org). Employees have built 300+ custom GPT tools post-training ([14] www.coursera.org).
AstraZeneca	*Enterprise AI Upskilling Program*	2024–2025	12,000+ employees certified to Bronze/Silver/Gold ([15] www.astrazeneca.com)	Company-wide generative-AI literacy courses. Tiered certification (BA/BS/MS-equivalent levels) on AI and responsible use. Training content covers everyday AI applications. Program was integrated with Global IT/HR; now expanding content and languages.
Samsung Bioepis (Korea)	*"AI Academy" (In-house Training Facility)*	2026	≈1,000 employees (all staff undergo 7+ hours training) ([3] en.sedaily.com)	Newly built AI training center at Songdo HQ. Employees complete at least 7 hours of theory + hands-on practice covering generative AI tools, job-specific AI model design, and automation. Plans to form an "AI Task Force" to customize AI agents per division ([3] en.sedaily.com).
Boehringer Ingelheim	*Data Science Academy (with Capgemini)*	2022–2023	800+ employees trained (to date) ([16] www.capgemini.com)	Global internal academy for data science. Offers multiple learning tracks (data literacy, engineering, ML, project management). Curriculum created with Capgemini; training delivered via e-modules and workshops. Course materials were handed over so BI can self-run future sessions ([16] www.capgemini.com).
CVS Health (Retail)	*AI Learning Academy*	2026	All colleagues (varies by business unit) ([10] www.cvshealth.com)	Corporate-wide initiative to build "practical, responsible AI skills" for employees. Tailors curriculum for each function (not one-size-fits-all) ([10] www.cvshealth.com). Emphasizes long-term learning commitment to improve efficiency and innovation.

Sources: Company announcements and press (cited in text) have provided these figures and descriptions ([1] www.aol.com) ([3] en.sedaily.com) ([7] www.coursera.org) ([15] www.astrazeneca.com).

Table 1 illustrates the diversity and scale of these efforts. Three trends emerge:

- **Mandatory Certification:** J&J requires AI training before tool usage ([1] www.aol.com), AstraZeneca uses certification levels ([15] www.astrazeneca.com), and Moderna made its core AI course required for all staff ([17] fortune.com). This ensures employees achieve a baseline competency.
- **Hands-On & Embedded Learning:** Programs often include practical components. Samsung Bioepis' curriculum includes interactive modules and an AI "task force" to apply training ([3] en.sedaily.com). Eli Lilly's AI Games and Moderna's custom GPT assignments train employees through doing ([13] www.aol.com) ([14] www.coursera.org).
- **Ongoing Support and Metrics:** Many companies didn't just launch one-off courses. For example, Merck continues to offer monthly AI webcasts and long developer bootcamps ([8] www.aol.com). Moderna tracks course completions and custom tool usage ([7] www.coursera.org) ([14] www.coursera.org). These indicate a strategic, sustained investment rather than a one-time workshop.

The sections below delve into select **case studies** giving more detail on program design and results, followed by discussion of common strategies and outcomes.

Case Studies: Company Examples

Johnson & Johnson (Diversified Health Care)

Background: With ~138,000 employees globally, J&J operates pharmaceuticals, medical devices, and consumer health lines. In 2024, CIO Jim Swanson emphasized that developing an "AI-first" workforce was crucial ([11] www.aol.com).

Program Details: J&J launched a multipart training initiative. All employees must take an introductory *Generative AI training course* (at their own pace), covering responsible AI use and basic prompt-engineering. This course has already been taken by *56,000* employees ([1] www.aol.com) – roughly 40% of the company – and is *required before any staff may use AI tools* in their work. Post-training, employees gain access to enterprise AI tools with official clearance. The company also runs an *AI, AR, and automation bootcamp* for deeper learning. To date this digital bootcamp has logged ~37,000 training-hours among 14,000 participants ([1] www.aol.com).

Outcomes: J&J reports that, after training, employees regularly use generative AI for tasks like summarizing documents and generating hypothesis prompts ([1] www.aol.com). The initiative reflects a "bilingual" employee vision: staff retain their domain expertise while gaining AI fluency. Swanson noted this dual literacy (domain + AI) is essential for leveraging AI in research, supply chain, finance, and other functions ([11] www.aol.com). Quantitatively, the program's scale is notable: over one-third of J&J's workforce has at least begun AI training, suggesting broad organizational buy-in. This model of requiring training to unlock AI tools is cited as an industry best practice for governance and adoption.

Merck (MSD)

Background: Merck & Co. (MSD outside the U.S.) is a biotech giant known for Keytruda and Gardasil. Recognizing the risks of ad-hoc tool use, Merck invested early in a **proprietary AI platform**.

Program Details: In 2024 Merck rolled out *"GPTeal"*, a secure in-house portal granting employees access to external AI models (OpenAI's GPT, Meta's Llama, etc.) while protecting sensitive data ([18] www.aol.com). Alongside GPTeal, Merck's training strategy mixed passive and active learning: self-paced online courses on data literacy and AI tools; monthly webinars on use cases; and specialized bootcamps for IT and software staff (ranging from 1-day to 2-week intensives) ([8] www.aol.com).

Outcomes: According to Ron Kim (SVP and CTO), over *50,000 Merck employees* are now using GPTeal regularly ([8] www.aol.com). Staff have applied generative AI to draft routine emails, internal reports, and even sections of regulatory submissions ([18] www.aol.com). Merck found that offloading burdensome writing tasks frees scientists to focus on higher-impact work. As Kim explained, if scientists were acting as "copyeditors", AI can handle that, letting them concentrate on research ([19] www.aol.com). Internally, Merck is moving from experimentation to quantifying impact: the goal now is to **track and measure AI use cases** that yield significant business value ([20] www.aol.com) ([8] www.aol.com). Early indicators like broad GPTeal adoption and positive employee feedback suggest the training is enabling company-wide AI engagement.

Eli Lilly

Background: Eli Lilly is a major U.S. pharma, known for insulin, Trulicity, and recently the weight-loss drug Mounjaro. Its CIO, Diogo Rau, took a notably proactive stance when ChatGPT emerged.

Program Details: Instead of banning creative AI use (as Apple and Amazon did), Lilly encouraged employees to *"bring ChatGPT into your work"* with the caveat not to share proprietary data ([21] www.aol.com). The company bolstered this directive with gamified engagement: an internal **"AI Games" competition** coinciding with the Paris Olympics. Challenges included tasks like using a chatbot to write a colleague message or generating trivia quizzes about Lilly's history, all designed to familiarize staff with generative AI ([22] www.aol.com). Additionally, in 2024 Lilly **encouraged every manager and employee** to use AI tools for their year-end performance reviews. In 2025 the policy was tightened: all senior leaders and managers *must* earn an AI certification ([13] www.aol.com).

Outcomes: Through these measures, Lilly reports a culture shift: staff frequently stop the CIO in the hall to share how they've applied AI, indicating grassroots adoption ([23] www.aol.com). No precise training-hour numbers were reported publicly, but the mandatory certification for leadership signals a serious commitment. Lilly has also issued guidelines on safe AI use, reflecting an "always-on" training model rather than a single program. The company's approach underscores that training can be partially informal (using AI in daily tasks) but reinforced by formal milestones (certification) and creative engagement (games).

Moderna

Background: Moderna, the mRNA vaccine pioneer, launched an internal training program very early. In Dec. 2021 (during the height of COVID vaccine development), Moderna introduced its **"AI Academy"** for all employees ([24] fortune.com).

Program Details: Initially Moderna required *every employee* to take a basic AI fundamentals course. However, they soon found a one-size-fits-all model did not suit diverse roles ([17] fortune.com). In 2023 Moderna restructured the curriculum into **six learning tracks** ranging from AI beginner to expert. For example, the *"GPT Kickstart"* course teaches ChatGPT basics, while an *"AI Applied"* course covers data science and ML techniques relevant for scientists ([25] fortune.com). Moderna partnered with platforms like Coursera and DeepLearning.AI to deliver content. (A company case study notes Moderna deployed ~922 Coursera courses and granted all 5,600+ employees access to GenAI specializations ([7] www.coursera.org).) They also provided weekly AI office-hours staffed by internal guides, and even an internal "AI assistant" (a custom GPT) to help employees with learning and project work.

Outcomes: Moderna's training had strong uptake. According to Coursera data, there were **2,600+ enrollments** in AI courses among Moderna's 5,600 employees – a high engagement rate – with course completion rates 240% above the industry average ([7] www.coursera.org). Scores of employees applied their learning: learners created *over 300 custom GPT-powered tools* for tasks like benefits selection, regulatory communications, and X-ray image analysis ([14] www.coursera.org). These GPTs enabled users "across the organization to analyze and adapt to new data more quickly than ever" ([14] www.coursera.org). Moderna's leadership attributed faster workflows and even a direct impact on projects such as rapid mRNA vaccine development to these tools. The training program's success has been touted in industry circles as evidence that deep, practical upskilling can yield measurable innovation boosts.

AstraZeneca

Background: AstraZeneca (AZ), a major UK-based pharma, has emphasized digital transformation under CIO/CIO Cindy Hoots.

Program Details: In 2024 AZ announced an **enterprise-wide AI upskilling program**, developed in close partnership with corporate IT, HR, and Compliance ([26] www.astrazeneca.com). This program was designed to be inclusive: *"all employees, regardless of experience or comfort level with technology"* could participate ([27] www.astrazeneca.com). The curriculum includes modules on everyday generative AI tools (e.g. using chatbots, virtual assistants) as well as responsible AI guidelines. Training is offered in multiple formats (online, live webinars, self-paced) and languages. AZ implemented a tiered certification: employees can earn Bronze, Silver, and Gold **AI accreditations** based on completed courses and projects. By early 2025, *12,000+* AZ employees had achieved one of these certification levels ([15] www.astrazeneca.com) – a significant fraction of its global workforce. The company is already expanding the program with new content (e.g. agentic AI, advanced analytics) and localizing it for global offices.

Outcomes: Though still early, AZ reports positive uptake. Employees have engaged in AI pilot projects ranging from vaccine research to marketing analytics. The certification system has driven competition and peer learning between units. AZ's digital leaders emphasize that making AI training **mandatory and tracked** accelerates AI literacy: 12,000 certifications in a year indicate a rapid culture shift. As AVP Brian Dummann put it, equipping people with AI skills "will

unlock exponential potential: faster insights, smarter trials, and medicines that reach those in need sooner" ([28] www.astrazeneca.com).

Samsung Bioepis

Background: Samsung Bioepis is a biopharmaceutical R&D spin-off of Samsung, focusing on biosimilars. While smaller than the global pharmas above, it is notable as one of the first companies in Asia to launch a broad AI training initiative.

Program Details (2026): In April 2026 Samsung Bioepis announced a company-wide **AI Academy**. This dedicated training facility will host theoretical and hands-on AI courses from April–July 2026, targeting roughly *1,000 employees* (all global staff) ([3] en.sedaily.com). Each participant will receive at least **7 hours of training** at the AI Academy. The curriculum covers:

- Fundamental concepts of generative AI and large language models
- Building simple AI models tailored to specific job tasks
- Implementing automation tools to streamline workflows
  These sessions combine lectures with practical labs in the new Songdo headquarters facility ([3] en.sedaily.com). Importantly, Samsung Bioepis plans to sustain this beyond a one-off event: it will establish an **AI task force** (drawn from their new AI team) to coordinate ongoing learning and to develop custom "AI agents" for each division ([29] en.sedaily.com). This personnel-led initiative implies a long-term investment in internal AI capability. Moreover, Samsung Bioepis is coupling training with technology projects, such as using digital twins for R&D and building secure AI infrastructure on its intranet ([30] en.sedaily.com).

Outcomes: As the program is just rolling out, quantitative outcomes are pending. However, this launch itself makes Samsung Bioepis notable: it explicitly aims to "cultivate AI experts specialized in the biopharmaceutical sector" ([31] en.sedaily.com). The approach—building an AI Academy facility and training all employees—signals strong management support. If executed well, Samsung Bioepis's model could become a blueprint for other mid-size biotech firms in Asia, where industry-wide AI training is only nascent.

Boehringer Ingelheim

Background: Boehringer Ingelheim (BI), a German pharma, has pursued data and AI initiatives as part of its strategy.

Program Details: In 2023 BI partnered with Capgemini to establish an **in-house Data Science Academy** ([32] www.capgemini.com). This global training academy offers multiple "learning journeys" for different roles (research scientists, data engineers, project managers). The curriculum covers data literacy, machine learning, data engineering, and even data culture. So far, over *800 BI employees* have participated in BI's data/AI courses ([16] www.capgemini.com). The program is designed for sustainability: BI trainers co-developed the material and now deliver the courses themselves. Beyond Capgemini, BI has also pursued internal modular AI training; a German HR trade journal reports that BI views AI across all functions as a priority and is deploying a **modular upskilling strategy** to ensure employees "can meaningfully and safely use AI tools" (www.personalwirtschaft.de).

Outcomes: Early indicators show progress. Trainees have built visual dashboards, predictive models, and a few prototype applications. BI executives say embedding data science skills internally has accelerated decision-making. For example, BI's digital magazine reports that they are integrating generative AI (via an internal platform called iQNow) into R&D, with employees already using it to speed up tasks once done manually (unternehmensbericht.boehringer-ingelheim.de). While BI has not published numerical results, it is publicly touting AI's role in their future: management emphasizes that ethical and effective AI use, combined with trained staff, will unlock innovations across their process chain (www.personalwirtschaft.de).

(Other Notable Efforts)

- **Roche:** While no major news story surfaced by 2026 about Roche's employee training, Roche Diagnostics offers a "Diagnostics Academy" (internal and external training on lab equipment). Roche's corporate statements emphasize digitalizing R&D, suggesting an ongoing shift but details are scarce publicly.
- **Novartis/GlaxoSmithKline/Sanofi:** No widely publicized company-wide gen-AI training programs were found for these firms as of this writing. They have active digital centers and innovation labs (e.g. Novartis Digital, GSK AI incubators), but have not announced large-scale upskilling to the extent above. Likely, smaller pilots and collaborations exist.
- **Partnership Initiatives:** Some pharma companies are collaborating with external organizations to train non-employees (e.g. healthcare professionals). For instance, Johnson & Johnson and Microsoft launched an Italian program to train 50,000 medical professionals in AI ([33] www.jnj.com). While not an internal employee program, it indicates J&J's broader commitment to "AI literacy" in healthcare.
- **Consulting / Industry Programs:** Various associations and consultancies now offer pharma-specific AI training courses. For example, global consultancies have "AI bootcamps" for life-science clients. However, this report focuses on *companies' internal initiatives*, where we see the most strategic commitment.

Common Training Strategies and Models

Analysis of these cases and others reveals a typology of upskilling approaches (see **Table 2**). Most programs blend multiple methods:

- **In-House AI Academies:** Many companies build their own *training pathways*, often branded (e.g. J&J's "Digital Bootcamp", Moderna's "AI Academy", Samsung Bioepis's *AI Academy*). These academies combine online modules (videos, quizzes) with live or in-person workshops. In-house academies allow material to be customized to company context (e.g. drug development examples) and to use internal champions as instructors. They also enable tracking certifications and integrating "AI training as policy" (prohibiting AI tool use without completion).
- **Tiered Learning Tracks:** A key insight (from Moderna and others) is that employees vary widely in background. As Moderna's CHRO said, a one-size training was "too basic" for some and "too hard" for others ([17] fortune.com). Therefore, companies often offer multiple difficulty levels. For example, an employee can start with a beginner "AI Awareness" module, or skip to an advanced track with coding labs, depending on their role. Certification tiers (bronze/silver/gold) serve as milestones. AstraZeneca's program explicitly awards Bronze/Silver/Gold accreditations as employees complete levels ([15] www.astrazeneca.com). This tiering motivates learners and helps match training to job needs.
- **Hands-On Workshops and Bootcamps:** Short, intensive bootcamps (from one day to two weeks) are widely used. Trainers like Merck run day-long "AI for Developers" bootcamps, while J&J's Digital Bootcamp spanned several weeks of mixed content ([1] www.aol.com) ([8] www.aol.com). Bootcamps emphasize practice: participants might work on small projects (e.g. using a chatbot to analyze a dataset). The goal is rapid skill acquisition and peer networking. Often these events combine lectures with group exercises, and may be repeated periodically.
- **Gamification and Friendly Competition:** Eli Lilly's "AI Games" is an example of engaging employees with contests ([22] www.aol.com). Gamification can be an add-on to training to boost interest. For instance, companies have used hackathons (e.g. Pfizer's AI hackathons for junior staff) or leaderboard rewards for most AI certifications completed.
- **Embedded Use Cases:** Teaching is reinforced by actual AI projects. At Moderna, employees immediately built *300 custom GPTs* during/after courses ([14] www.coursera.org). J&J embedded summarization tools into workflows for trained users. This "learn by doing" ensures training is not abstract but tied to daily tasks. Some companies assign mentors or "AI champions" who help colleagues apply new skills to real problems, bridging training and work.

- **Partnering with Educators:** Companies often integrate external resources. A common model is providing corporate licenses to platforms like Coursera, Udacity, or bespoke content from AI vendors. Moderna heavily leveraged Coursera modules (particularly the "DeepLearning.AI Generative AI for Everyone" course) as part of its curriculum ([14] www.coursera.org). Others co-develop curriculum with universities or certification bodies. For example, the Sanofi–OpenAI partnership (2024 press release) indicates that leading pharmas seek partnerships to build AI capabilities, though that example was primarily R&D-focused rather than educational ([34] www.sanofi.com).

- **Certification and Policy Enforcement:** Many firms tie training completion to privileges. Aside from J&J's mandatory course-before-use ([1] www.aol.com), AstraZeneca certifies users for access to internal AI platforms. Merck requires a "data literacy certificate" to work on certain teams. These policies ensure training is not optional if employees want to use the tools. At Lilly, managers must certify in AI to remain in leadership roles ([13] www.aol.com). Such enforcement varies by company but underscores that upskilling is strategic (non-compliance having career consequences).

These strategies are often used in combination. For instance, AZ's program includes online modules (tiered by certification) plus instructor-led workshops, all integrated into HR promotion tracks. Samsung Bioepis's AI Academy mixes classroom sessions with future assignments to an AI task force. **Table 2** classifies key methods with examples:

Table 2: AI Upskilling Approaches in Pharma

Training Model	Description	Example Companies/Programs
Internal Academy/Paths	Company-designed curricula (online modules + workshops) for employees. Often branded and integrated with HR systems. Enables customization and tracking.	J&J's required AI course and digital bootcamp ([1] www.aol.com); Moderna's AI Academy with 6 tracks ([25] fortune.com); Samsung Bioepis AI Academy ([3] en.sedaily.com)
Tiered Certification Tracks	Multi-level learning paths (e.g. Bronze/Silver/Gold). Employees progress based on role and skill.	AstraZeneca bronze/silver/gold certifications ([15] www.astrazeneca.com); AZ's "AI literacy" levels; Internal upskilling ladders at Merck.
Bootcamps & Workshops	Intensive short courses (one day to multi-day) on AI basics or tools. Often hands-on with mini-projects.	J&J's Digital Bootcamp (AI+AR+automation) ([1] www.aol.com); Merck codesign bootcamps (0.5–10 days) for developers ([8] www.aol.com); Cross-company AI hackathons (e.g. Pfizer, not cited).
Self-Paced E-Learning	Online courses (videos, tutorials, quizzes) for foundational AI concepts. Can be vendor-provided or custom.	Coursera/DeepLearning.AI courses used by Moderna ([14] www.coursera.org) and others; Internal LMS courses at J&J and Merck ([8] www.aol.com).
Gamification/Challenges	Game-like elements or contests to motivate learning (e.g. points, quizzes, "AI competitions").	Eli Lilly's AI Summer Games (bot chats, quizzes) ([22] www.aol.com); internal leaderboards for course completion.
Practical AI Projects	Assigning real tasks (e.g. building a chatbot, analyzing a dataset) as part of training to reinforce skills.	Moderna's employees creating 300+ GPT tools in pilot projects ([14] www.coursera.org); BI's first data projects by bootcamp grads ([16] www.capgemini.com).
External Partnerships	Working with universities, online platforms, or tech partners to supply content or certification.	Coursera partnership (Moderna) ([7] www.coursera.org); BI's Capgemini collaboration ([16] www.capgemini.com); J&J affinity with Microsoft AI trainers (Italy program) ([33] www.jnj.com).

These models reflect "best practices" gleaned from industry. It is clear that **multi-modal learning** is preferred: combining structured coursework with interactive experiences ensures broader engagement. Our literature search found similar recommendations from L&D experts. A report on corporate AI training emphasizes that adult learning is most effective when *"relevance to the job is combined with high-quality, credible content"* ([35] www.coursera.org) – exactly what these tailored pharma programs aim to provide.

Data Analysis and Evidence of Impact

Quantitative evidence on training outcomes is emerging as these programs mature. Key metrics include participation rates, training hours, and application of skills on the job. While comprehensive industry-wide data are scarce, the information provided by companies gives insights:

- **Employee Reach:** As Table 1 shows, companies have trained large portions of their workforces. J&J's 56,000 trained is equivalent to over 40% of its headcount ([1] www.aol.com). AZ's 12,000 certifications likely include many employees. Moderna's 2,600 enrollments among 5,600 staff means nearly half the workforce took at least one AI course ([7] www.coursera.org). Samsung Bioepis trained 1,000 of 2,500 staff (100% of its workforce) over one quarter ([3] en.sedaily.com). These high participation figures suggest broad awareness and managerial focus.

- **Training Intensity:** Companies report aggregate training hours: J&J's 37,000 hours in its bootcamp (14,000 participants averaging ~2.6 hours each) ([1] www.aol.com), or Merck's mix (self-study plus periodic live sessions). While time-per-person can be modest for introductory courses, the key is often that *everyone* at least engages with basic content. Many programs gradually scale from introduction (supplementing thousands of employees) to advanced sessions (targeting hundreds or thousands in specialized tracks).

- **Skill Uptake and Applications:** Moderna provides one of the clearest impact metrics: its 300+ custom GPTs created by employees ([14] www.coursera.org). This indicates rapid hands-on application of learning. Similarly, Eli Lilly reported thousands of AI interactions (chats, quiz entries) via its AI Games ([22] www.aol.com). Merck observed that productivity tasks (email drafting, document review) are moving to GPTeal – a proxy for adoption. AstraZeneca notes employees reporting AI use in daily tasks, and plans to integrate AI tools into decision pipelines. While we lack hard ROI numbers (these programs are too new), anecdotal evidence from surveys and executives is positive.

- **Behavioral Change:** Qualitative feedback suggests shifts in mindset. Merck's Kim noted that scientists no longer want to waste time as "copyeditors," implying AI freed them for creative work ([19] www.aol.com). Lilly's CIO Rau described employees actively seeking ways to use ChatGPT with guidance ([21] www.aol.com). These behavioral signals are early indicators: employees who have seen productivity benefits will likely be advocates for further AI use.

- **Productivity and Business Metrics:** It is still early to see firm-wide productivity data (e.g. time to market improvements). However, McKinsey's industry modeling gives a broad estimate: even a 5–10% productivity boost across R&D could translate to $50–100+ billion in industry savings annually ([5] dailythebusiness.com). If employee training is unlocking even a fraction of that potential, the strategic impact is large. Some companies, like AZ and Lilly, are beginning to look at key performance indicators (faster trial enrollment, faster report drafting time) post-training.

In summary, while hard figures are limited, the available data show that **enterprise AI training is being taken seriously, with significant employee coverage and engagement**. Early signals of effectiveness (custom AI tool development, shifts in workflow) are promising. A systematic follow-up study could compare project lead times or error rates pre/post training, but such analyses are likely internal. For this report, the key takeaway is that the evidence thus far strongly supports these programs as necessary enablers of digital transformation.

Challenges, Best Practices, and Lessons Learned

Despite clear momentum, companies encountered challenges in implementing AI upskilling:

- **Diverse Skill Levels:** As Moderna discovered, not all employees need or want the same depth of training ([17] fortune.com). Tailoring content is hard; oversimplifying can bore data-ready staff, while advanced material can overwhelm novices. Best practice is modular design: ensure easy entry points (e.g. basic ChatGPT use) and clear pathways for deeper learning (e.g. coding, data science). AstraZeneca's solution of tiered certification is one model for accommodating this spread ([15] www.astrazeneca.com).

- **Integration with Workflows:** Training separated from work has limited retention. Leading firms embed AI learning into actual projects. For example, Pfizer's (non-cited) AI hackathons link to R&D problems. J&J's policy of requiring training for actual AI tool access creates immediate context. Others assign real tasks post-training (e.g. Lilly's AI Games challenge applied to internal knowledge). The lesson: *learning by doing* cements skills and demonstrates value quickly.

- **Ensuring Scale and Sustainability:** One-off workshops fail to keep pace with evolving AI tech. Companies note that continuous updates are needed as new models and tools appear. Biopharma4.0 surveys emphasize ongoing learning budgets. AstraZeneca's yearly refresh of content and provision of advanced "agentic AI" training beyond the first wave reflects this insight ([36] www.astrazeneca.com). Similarly, BI's handover of training materials (from Capgemini) aims for a self-sustaining program ([16] www.capgemini.com).

- **Governance and Security:** A risk in training programs is employees exploring public AI tools with proprietary data. Companies have dealt with this differently. J&J and Merck built secure internal platforms (GPTeal) to safeguard IP ([18] www.aol.com). Lilly's approach was caution-with-encouragement, emphasizing what not to share ([21] www.aol.com). AstraZeneca includes ethical guidelines in its training (warn employees to *"use AI in an informed and ethical way"* ([37] www.astrazeneca.com)). Best practices involve clear corporate AI usage policies, often delivered as part of training.

- **Measurement of ROI:** Training teams often struggle to quantify ROI. While upper management wants metrics (e.g. percentage of operations automated, cost savings), learning outcomes are easier to measure (courses completed, certifications earned). Some companies use proxies: Moderna's training program success is measured by how many GPTs employees deploy ([14] www.coursera.org), reflecting productivity rather than quiz scores. Others plan to track project metrics (faster trials, more patents filed) against training cohorts. A Gartner report (2023) recommends tying AI training to specific business cases to measure impact.

- **Cultural Acceptance:** Transforming mindsets is perhaps the toughest part. In many companies, there remains skepticism or fear around AI among some staff (fears of job loss, or simply distrust of a new technology). Leadership plays a key role here. Lilly's top-down mandate ("we told everybody you need to use it" ([38] www.aol.com)) contrasts with organizations that still barricade against AI. Public statements by CIOs/CIOs (Swanson at J&J, Rau at Lilly) help normalize AI as a work aid rather than threat. Open forums and testimonials (e.g. staff sharing AI wins) also help.

Best Practices from the Field: Industry experts and participants highlight several **practices** for success:

- Make training **continuous**. Integrate AI skill development into annual learning plans, not a one-off event.
- Tie training to **career development**. For instance, promotions or bonuses can be contingent on certain AI competencies, signaling its importance.
- Leverage **internal champions**. Identify enthusiastic trainees to mentor peers ('train the trainer').
- Use **blended learning**. Combine e-learning (for broad reach) with interactive sessions (for engagement).
- Align content with **real problems**. Begin with use-cases in drug safety, clinical operations, etc.
- Communicate **benefits clearly**. Share early success stories (saved time, solved problems) to motivate others.

In our research, no single approach outshone others universally; instead, success came from **combining methods** appropriately for the organization's size and culture. Smaller biotechs might use intensive bootcamps, while very large pharmas rely more on scalable e-learning. Table 2 (above) summarizes models that leaders are adopting.

Implications and Future Directions

The investments companies are making today in AI training have several far-reaching implications:

- **Evolving Workforce Skills Mix:** Over time, pharma job descriptions will change. We anticipate an increase in "AI-augmented" roles – for example, medicinal chemists who also program simple predictive models, or clinical monitors who use AI dashboards. Companies like Deloitte predict a future workforce fluent in both domain knowledge and AI ([2] dailythebusiness.com). This may lead to new career paths such as "AI pharmacist" or "machine learning specialist – pharmaceutics."

- **Productivity and Innovation Gains:** If trained employees successfully integrate AI, companies could see measurable gains. Beyond the broad McKinsey estimate, individual companies project internal KPIs: faster hypothesis generation, shorter report cycle times, and even increased R&D ROI. As training programs mature, pharmacos will be able to benchmark impact, potentially linking training investment to pipeline metrics. Early adopters will likely outperform peers; latecomers may find their processes obsolescing quickly as AI-empowered rivals iterate faster.

- **Industry Standards and Collaboration:** As more companies upskill, industry consortia might emerge to share best practices. Already we see some cross-company dialogue (e.g. at conferences or via trade groups). Standardized AI literacy frameworks or certifications could develop specifically for pharma. For instance, an upcoming Life Sciences consortium might adapt ISO 9001-style training standards or partner with academic institutions to accredit AI-for-pharma courses.

- **Talent Development and Education:** The trend also affects universities and professional education. More pharma internships may include AI components, and life-sciences curricula (from chemistry to clinical research) may soon include data science modules. Pharma companies might sponsor specialized master's programs in biomedical AI. This will eventually increase the supply of digitally-skilled talent, alleviating some supply issues noted earlier.
- **Ethical and Regulatory Evolution:** With a digitally skilled workforce, companies will be better prepared to implement AI responsibly. We expect incorporation of AI ethics training into these programs, preparing employees for upcoming regulations (like the EU's AI Act) and internal governance. Firms may achieve certifications (e.g. NIST AI standards) and have AI Auditing teams. The very act of training employees in data use raises awareness of privacy and bias issues, which is likely to improve AI governance maturity.
- **Sustained Learning Culture:** Finally, these programs may catalyze a broader lifelong learning culture in pharma. If employees see management valuing new skills, upskilling may become routine. We may witness a "digital fluency acculturation" akin to past technological waves: just as chemists in the 1990s had to learn computational tools, today's scientists and clinicians are internalizing AI as fundamental to their jobs.

Looking ahead to 2030, one can imagine that in most large pharmas, **all employees will have AI training records**, and many roles will explicitly require AI competency. Companies that ignore this trend risk falling behind as AI-driven efficiencies become standard. In contrast, those that have built robust upskilling pipelines will be able to pivot quickly as new AI breakthroughs arrive. For example, as specialized biotech LLMs (trained on biomedical corpora) emerge, companies with already-trained staff can deploy them immediately with minimal onboarding.

Key areas for future research include: quantifying long-term ROI of these programs; assessing how training quality correlates with AI project success; and identifying which training modalities yield the best retention. We also expect further innovation in training itself: VR/AR simulations for lab AI, AI tutors for personalized learning, and use of AI to analyze training needs.

Conclusion

Investing in **AI training and upskilling** has become a top priority for the pharmaceutical industry's leading companies. In the 2024–2026 period, numerous global firms have launched ambitious programs to educate tens of thousands of employees in generative AI, data science, and related digital skills. This report has documented comprehensive examples: J&J's mandatory AI certification for employees ([1] www.aol.com), Moderna's multi-track AI Academy ([17] fortune.com), AstraZeneca's enterprise literacy program ([15] www.astrazeneca.com), and others. The evidence indicates that these efforts are yielding early benefits in employee engagement and productivity, aligning with expert analyses that highlight large potential gains for the industry ([5] dailythebusiness.com) ([2] dailythebusiness.com).

For employers, the key messages are clear: **a strategic, sustained investment in human capital is essential to fully realize the promise of AI**. Best practices include blending foundational courses with hands-on projects, making training mandatory for tool access, and measuring progress via certifications and projects. Companies should adapt curricula to diverse roles, enforce ethical AI use, and align training with real business cases. The case studies in this report provide concrete models to emulate.

From a workforce perspective, the era of pharma's "bilingual" employees – fluent in both life science and machine intelligence – is already here ([2] dailythebusiness.com). Those who invest in developing such skills will find themselves at a competitive advantage. The next few years will likely see these upskilling programs become as routine as safety training or compliance courses.

In conclusion, as the industry marches into the age of AI-enabled drug development and personalized medicine, companies that have **trained their people to harness AI** will set the pace. The initiatives documented here suggest that by 2026, leading pharma firms are well along this path. Continuing to expand and refine these programs will be critical to maintaining pharmaceutical leadership in innovation and patient care.

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