

# Akshat Sunil Jain

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## EDUCATION

### National Institute of Pharmaceutical Education and Research

Mohali, India

M.S. (Pharm.) Medicinal Chemistry

2024-2026; 9.87 CGPA till 3<sup>rd</sup> sem

Gujarat Technological University

Gujarat, India

Bachelor of Pharmacy

2020-2024; 9.24 CGPA

Central Board of Secondary Education (CBSE), India

Gujarat, India

PCB Stream at Shri L.G. Haria Multipurpose School

2018-2020; Percentage: 94.8

Central Board of Secondary Education (CBSE), India

Gujarat, India

Shri L.G. Haria Multipurpose School

2017-2018; Percentage: 87.4

## RESEARCH EXPERIENCE

### *Design and Synthesis of Pyridopyrimidine-Based Phospha-Flavone Analogs as Potential Antibacterial Agents* - National Institute of Pharmaceutical Education and Research, Mohali | 2025 - Present

- Designed and synthesized novel pyridopyrimidine-based phospha-flavone analogs using scaffold hopping and pharmacophore optimization strategies targeting antibacterial resistance.
- Developed and optimized multi-step synthetic routes including substituted phenylacetynes and phosphonate intermediates with Lewis acid-catalyzed cyclization approaches.
- Performed reaction optimization (solvent, additive, and temperature screening) to improve yield and reaction efficiency.
- Characterized synthesized compounds using <sup>1</sup>H NMR, <sup>13</sup>C NMR, and mass spectrometry for structural validation.
- Proposed future directions including ADMET prediction and antibacterial activity evaluation (MIC studies).

## PROJECTS

### *Sovereign Zenith v10.2 - Sovereign Strategic Intelligence Engine*

- Built a "Sovereign Arch-Singularity" engine for absolute market dominance, capable of generating 20+ complex Excel workbooks, 40+ interactive dashboard charts, and board-ready portfolio slide decks via an integrated MCP AI Consultant terminal.
- Implemented a 30-agent swarm forensics architecture powered by Nash equilibrium game theory and Monte Carlo simulations; delivered a prestige-grade glassmorphism UI using D3.js and Three.js for high-fidelity, interactive data visualization.

**Technology Used:** Prompt Engineering, SKILL.md, AGENT.md, MCP Protocol, D3.js, Three.js, Python, Plotly, CSS Glassmorphism

### *Pharma Strategic Intelligence-OS – HEOR and CI Suite*

- Architected a 12-dimensional competitive intelligence system covering Pipeline Forensics, Regulatory Intelligence, and Financial Dominance (rNPV/DCF); automated the production of 50+ institutional deliverables including interactive battlecards and payer dossiers.
- Integrated advanced Bayesian NMA and HEOR modeling for clinical evidence synthesis; orchestrated Nash war-gaming and KOL mapping modules to enable autonomous strategic forecasting and market entry simulation.

**Technology Used:** Prompt Engineering, SKILL.md, AGENT.md, MCP Protocol, D3.js, Three.js, Python, Plotly, CSS Glassmorphism

### *Nexus v27.0 - Principal Strategic Intelligence Protocol*

- Engineered the "Principal Strategic Intelligence Protocol," collapsing 20 autonomous agents and 17 specialized skills into a deterministic cognitive pipeline featuring 11 Singularity Kernels across Oncology, Immunology, Neurology, and Vaccines.
- Enforced a mandatory 50-source evidence mandate with a Polymorphic Triad fusion architecture (Agent + Skill + Code Engine); deployed a 5-team adversarial swarm system to ensure forensic-grade validation and immutable strategic provenance.

**Technology Used:** Prompt Engineering, SKILL.md, AGENT.md, MCP Protocol, A2A, D3.js, Three.js, Python, Plotly, CSS Glassmorphism

## **PharmaOS** – *AI-Native Pharmaceutical Intelligence Platform*

- Built a production-grade multi-domain competitive intelligence system that transforms heterogeneous pharma signals (trials, publications, regulatory, competitor moves) into structured, executive-ready daily briefings.
- Designed a 4-workflow orchestration architecture in n8n with LLM-driven domain briefings, impact scoring, compound event detection, CSV export, and multi-channel dispatch (Executive Email, Slack Exec/Ops/Domain, PagerDuty) backed by a robust Postgres audit log.

**Technology Used:** n8n, PostgreSQL, Python (FastAPI services), OpenRouter LLM APIs (GPT-4.1 and others), Slack Block Kit, PagerDuty Events API v2, Docker, Google Cloud Platform

## **Veda OS** - *AI-Native Clinical Trial Design Operating System*

- Architected an end-to-end agentic AI platform for intelligent clinical trial protocol design and optimization using Google MedGemma with multi-agent orchestration.
- Engineered a Self-Driving Trial Twin module for simulating clinical scenarios, predicting dropout rates, and ICH-GCP compliant protocol auto-flagging.

**Technology Used:** Python, Google MedGemma, LangGraph, MCP Server, FastAPI, Next.js, LangChain, Google Cloud Platform, N8N

## **PharmaIntel** - *Multi-Agent Pharma M&A Intelligence System*

- Architected a 5-agent AI pipeline (MarketScout → RegulatoryHawk → ValuationQuant + SentimentOracle → StrategyArchitect) using Google ADK, reducing M&A analysis from 4–6 weeks to 2–3 minutes at 87.5% accuracy.
- Engineered 10,000-iteration Monte Carlo simulations with VaR/CVaR tail risk, 3D knowledge graphs, 90-day sentiment forecasting, and Gemini 2.0 Flash-powered Acquire/Partner/Monitor/Pass decision memos.

**Technology Used:** Python, Google ADK, Gemini 2.0 Flash, Plotly, Monte Carlo Simulation, Vector Memory, A2A Message Bus

## **OncoWatch** - *Oncology Competitive Intelligence Workflow Suite*

- Built a 5-workflow n8n automation suite ingesting oncology signals from ClinicalTrials.gov and PubMed with AI-powered triage, priority scoring, and CRITICAL alert dispatch to executive Slack channels.
- Implemented Human-in-the-Loop override system (APPROVE/ESCALATE/DISMISS/RECLASSIFY) with full PostgreSQL audit logging and automated daily CI digest generation.

**Technology Used:** n8n, PostgreSQL, Gemini/Groq LLM APIs, Slack API, JSON Workflow Orchestration

## **Drishti CI** - *Pharma Competitive Intelligence API*

- Built a purpose-built pharma CI infrastructure API featuring polite robots-aware crawling, FastAPI job submission/tracking endpoints, and Celery + Redis orchestrating long-running research pipelines.
- Engineered a 6-level intelligence stack (Documents → Signals → Context → Predictive → Alpha → Learning) transforming noisy public data into structured, decision-grade competitive insight.

**Technology Used:** Python, FastAPI, Celery, Redis, Scrapy, LLM APIs

## **Sarvagya AI** - *Agentic Consulting Operating System*

- Built a consulting OS with a 5-layer reasoning architecture (Decomposition → Frameworks → Analysis → Synthesis → Recommendation), coordinating specialized agents for strategy, GTM, execution, and financial modeling.
- Implemented multi-provider LLM routing with smart fallback across Groq, OpenRouter, and GitHub Models; integrated a secure Python sandbox for live Plotly simulations and board-ready PDF/DOCX deliverable generation.

**Technology Used:** Next.js, TypeScript, Tailwind CSS, Node.js, MCP, GPT-4o, Claude 3.5 Sonnet, Llama 3.3, Groq, OpenRouter, Express

## **Aarogyaa Intelligence** - *AI-Native Hospital Operating System*

- Developed an enterprise hospital OS featuring a live orchestrator topology with particle-physics workflow visualization and an autonomous pharmacy command center with Dhanwantari AI safety checks and biometric interlocks.
- Integrated Gemini Vision for multimodal radiology report generation and a supply chain module with auto-generated purchase orders on low-stock detection.

**Technology Used:** React 19, TypeScript, Vite, Tailwind CSS, Zustand, Google Gemini 2.5 Flash

## **CVdost** - *Agentic AI Career Engine*

- Built an end-to-end resume intelligence platform performing ATS scoring, semantic JD matching via transformer embeddings, and skill gap analysis using FAISS vector search; deployed live on Streamlit Cloud.

**Technology Used:** Python, FastAPI, Streamlit, LangChain, OpenAI, Sentence-Transformers, FAISS, ChromaDB, spaCy, KeyBERT

## AERPA - Automated Enterprise Risk & Predictive Analytics

- Built a real-time pharma batch risk intelligence system in Excel + VBA with 43 engineered features, 5-method ensemble anomaly detection, and FDA 21 CFR Part 11 compliant automated alerts via Email, Slack, and SMS.

**Technology Used:** Excel VBA

## WORK EXPERIENCE AND INTERSHIPS

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### Co-Founder & Educator | VIBRAINO – The Frequency of Knowledge (2021–2024)

- Led a 9-member team; designed JEE and NEET course curriculum and mentored 200+ students across subjects.

### Senior Faculty – Organic Chemistry | Pharmaminds (2025–Present)

- Delivered 200+ hrs of coaching for GPAT/NIPER aspirants; designed structured high-yield content modules.

### Business Development Intern | Internshala (Jul–Sept 2023)

- Boosted campus engagement by 20%; onboarded 70+ students; awarded "Exceptional Performer".

### Industrial Intern | Inject Care Parenterals, Vapi (Jul 2023)

- Supported sterile manufacturing operations and cGMP documentation processes.

## CERTIFICATIONS & COURSES

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- ICH-GCP Certification – NIDA Clinical Trials Network
- Google Data Analytics Professional Certificate – Coursera (R, SQL, Excel, Tableau, Power BI)
- 5 Day Intensive Agentic AI Development Course – Kaggle X Google Deepmind
- Mckinsey Forward Program – Mckinsey & Company
- Machine learning on BigQuery ML – Google Skill Cloud
- Prompt Engineering & Generative AI – IBM, Vanderbilt University (ChatGPT, Gemini, Advanced Data Analysis)
- SAS Programming (Beginner) – Udemy
- JMP (Design of Experiments & Data Analysis) – NIPER S.A.S. Nagar
- SQL, Python & Excel Bootcamps – LetsUpgrade Community
- Business Analytics & Advanced Excel – SkillUp, Udemy
- Generative AI & ML Projects – LetsUpgrade, AcceleratorX (RAG Models, MCP Servers, Machine Learning)
- Strategic Consulting & Data Analytics Job Simulations – Forage (BCG, PwC, Accenture)

## TECHNICAL SKILLS AND INTERESTS

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**Languages:** Python, SQL and R

**Agentic AI and Automation Tools :** Prompt Engineering (Advanced), Vibe Coding, Agentic AI Orchestration, Multi-Agent Systems (CrewAI, LangGraph), MCP Server Development, RAG Modelling, LLM Fine-Tuning, AI Workflow Automation (N8N and Zapier), Slack, Google ADK, SKILL.MD Designing, Agent.MD Designing.

**Medicinal Chemistry and Drug Discovery :** Synthetic Route Design & Optimization, Scaffold Hopping, Pharmacophore Modeling, Reaction Mechanism Analysis, Spectral Interpretation (<sup>1</sup>H NMR, <sup>13</sup>C NMR, MS, IR, UV), Molecular Docking, ChemDraw, Chem3D, Mestrenova

**Framework & Dev tools :** FastAPI, Streamlit, Next.js, LangChain, FAISS, ChromaDB, Sentence-Transformers, spaCy, KeyBERT, UVICORN, Git, GitHub, Google Colab, VS Code

**Data and BI Tools :** Excel, Power BI and JMP

**Areas of Interest:** AI Workflow Automation, Prompt Engineering & Vibe Coding and Agentic AI & Multi-Agent Systems

**Soft Skills:** Problem Solving, Leadership, Public Speaking, Adaptability, Multitasking, Planning & Execution

## POSITIONS OF RESPONSIBILITY

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- Placement Coordinator, Department of Medicinal Chemistry, NIPER S.A.S. Nagar
- Reviewer, BP International & JOCAMR (Academic Publications)
- Senior Faculty Member, Pharmaminds (Organic Chemistry – GPAT/NIPER)

## ACHIEVEMENTS

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- **AIR 08** – NIPER JEE 2024 | **AIR 158** – GPAT 2024 | CUET PG 2024 Qualified | RRB Pharmacist 2025 Qualified **100%ile Score**
- Published 3 book chapters and 2 review articles in peer-reviewed journals
- Invited Book Chapter Reviewer – BP International & JOCAMR (Reviewed 7 Book Chapters and Review articles)
- Startup showcased at SRCC Startup Conclave 2023 (signed MoU) and IIT Bombay Eureka Fest
- Finalist – National Level Model & Poster Presentation, Physical Research Laboratory, Ahmedabad (ISRO Research Unit)
- Ranked in Top 10 throughout all 8 semesters at University level

