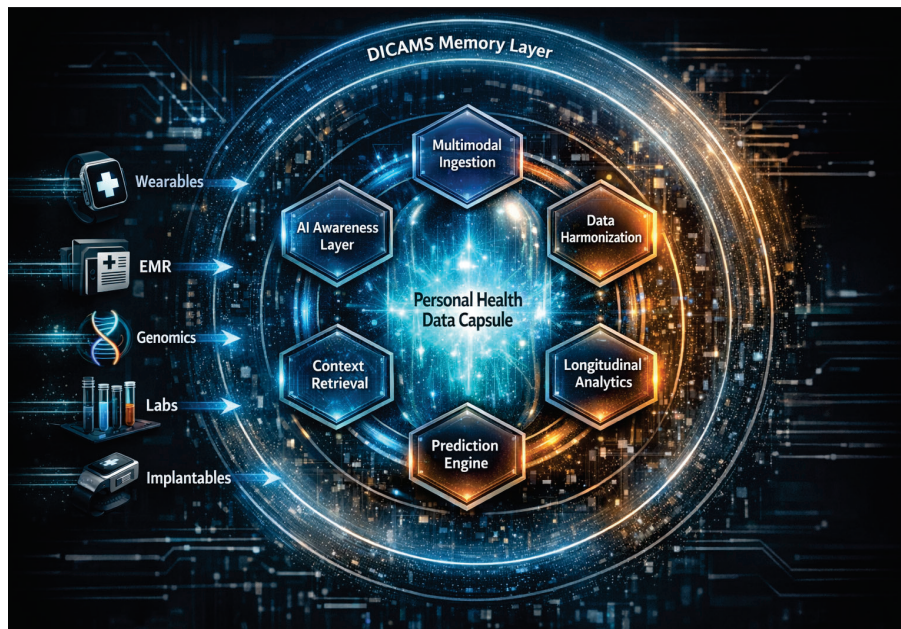


Continuously Updated, Multimodal Health Data Ecosystem

A platform that integrates heterogeneous biomedical signals into a single, coherent "Personal Health Data Capsule" to power real-time predictive health modeling.



What Simupharma Does

- Ingests multimodal biomedical data (EHR, wearables, implantables, labs, genomics).
- Harmonizes data into a time-indexed, individual-specific data capsule.
- Runs longitudinal analytics to learn personal baselines and detect deviations.
- Uses AI awareness + context retrieval for personalized predictions and simulations.
- Delivers actionable insights through advanced interactive health simulations and research portals.
- Maximizes personal health engagement for better outcomes.

Scalable to population level simulations



Learn more

Core Interacting Components

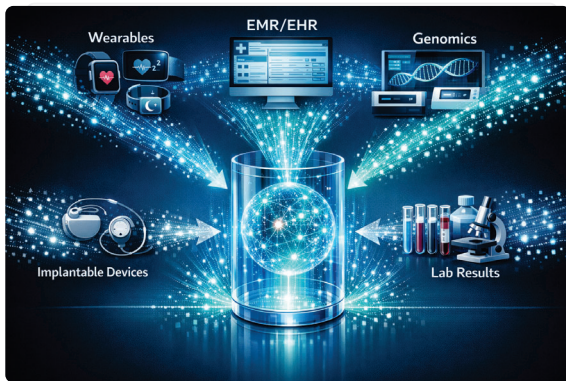
- 1. Ingestion Layer:** REST/FHIR/HL7 connectors, streaming (WebSockets/MQTT/BLE), batch pipelines, and schema validation.
- 2. Harmonization Engine:** Noise filtering, feature extraction, dimensionality reduction, and cross-modal alignment.
- 3. Longitudinal Analytics:** Adaptive baselines, trend detection, state segmentation, and correlation analysis.
- 4. AI Awareness Layer:** Anomaly detection, temporal forecasting, online model updating with drift compensation.
- 5. Context Retrieval Engine:** NLP + Knowledge Graph traversal across guidelines, literature, and pathways.
- 6. Prediction & Simulation:** Early warnings, disease progression forecasts, and counterfactual "what-if" simulations.
- 7. Output & Integration:** Advanced interactive health simulations, personal health metrics, EHR modules, and research portals.
- 8. Intuitive User Experience:** Informative and explorable.

DICAMS Memory Advantage (U.S. Patent No. 12,332,841 B1)

Feature	Standard Healthcare AI	Simupharma + DICAMS
Cross-Session Memory	Forgets past sessions	Remembers patient history
Personalization	Shallow or generic	Deep, real-time personalization
Token Efficiency	High token costs	Efficient via contextual compression
Narrative Continuity	Fragmented	Maintains long-form context
Explainability	Minimal transparency	Auditable, explainable

Information Flow & Operations

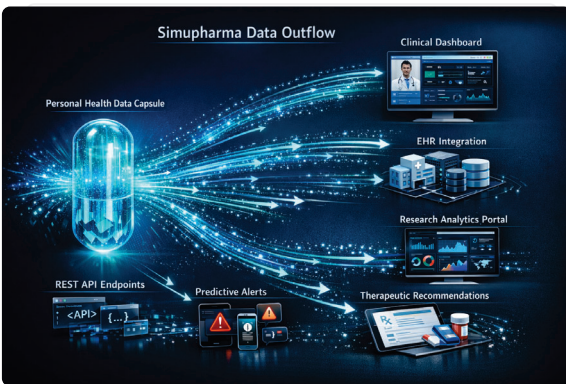
Data Inflow



Capsule Internal Layers



Insight Outflow



Operational Model

- **REST Orchestration:** Central orchestrator coordinates specialized AI agents via standardized endpoints with authentication and monitoring.
- **Deployment:** Cloud-native (Kubernetes, GPU-accelerated), Edge-Cloud hybrid, On-prem or on-device for data sovereignty, or Federated Learning.
- **Security:** Zero-trust networking, encryption at rest/transit, role-based access control, and secure API gateways. User-controlled permissioning.
- **Integrity:** Cryptographic provenance tracking, immutable audit logs, and model drift detection.

*Simupharma: Multimodal Ingestion → Harmonized Data Capsule → Longitudinal Analytics
→ AI Awareness + Context → Prediction → Simulation → Clinical & Research Integration.*

Individual health ecosystems Evolve your health

