



# Empowering a new era of precision health: from precision discovery to the last mile of precision delivery



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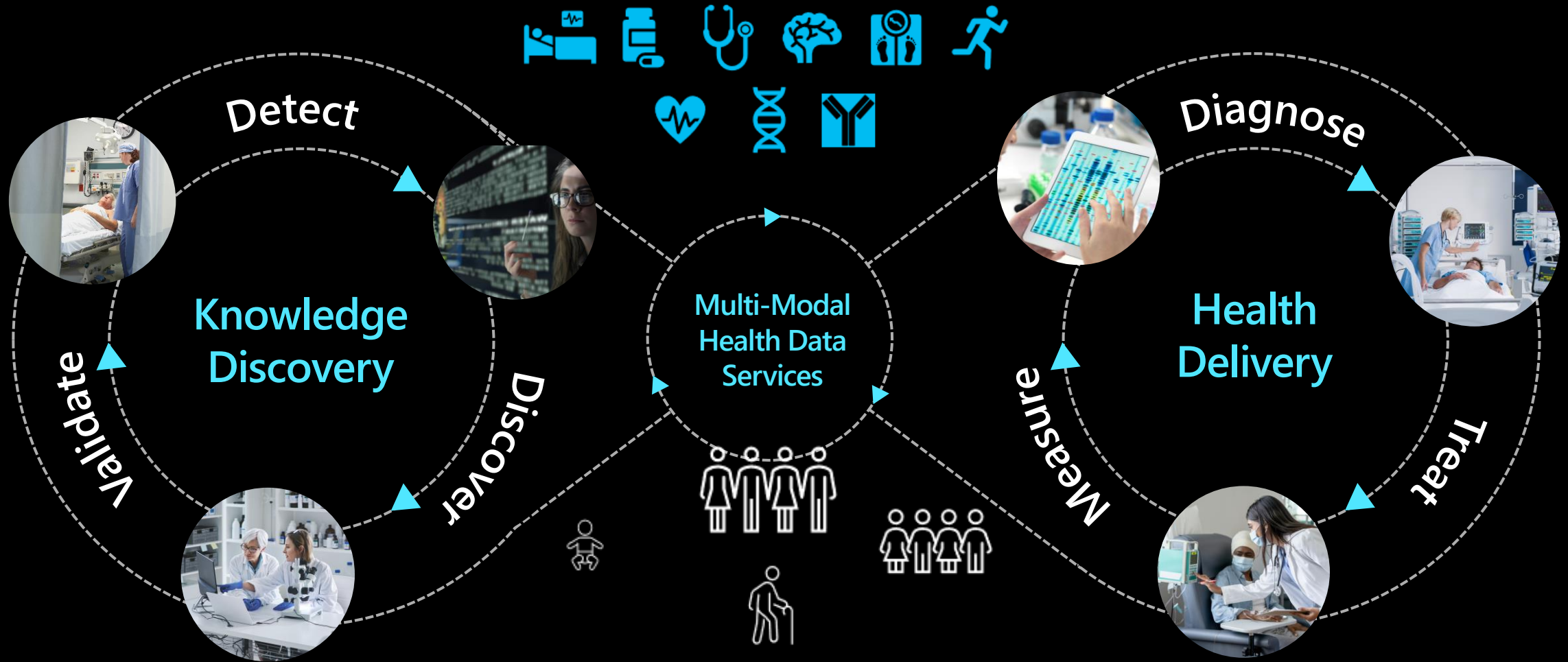


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# Precision Health: AI enabled Discovery and Delivery



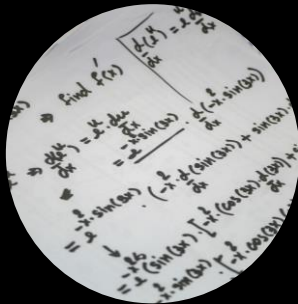
# Four decades of accelerated health technology innovation

1980's/90's



Evidence-based medicine

2000's



Hand-crafted models & scarce data

2010's



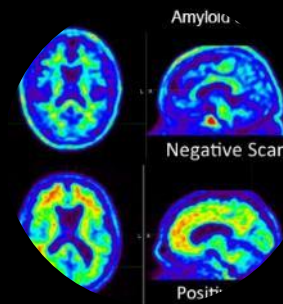
Electronic Health Records and Big Data

2010's



Models start to be learned from fuller data

2020's



Multimodal AI (unstructured text + imaging)

2020's



Personalization & well-being  
Responsible AI

2020's



Population Health & Smart Cities

**Clinical Audit/Governance**  
1-way: research → practice

**Learning Health Systems**  
2-way: research <-> practice

**Precision and Population Health Systems**  
360-degree view of the patient

We're witnessing a  
historic influx of data,

data that can help save lives  
If managed effectively



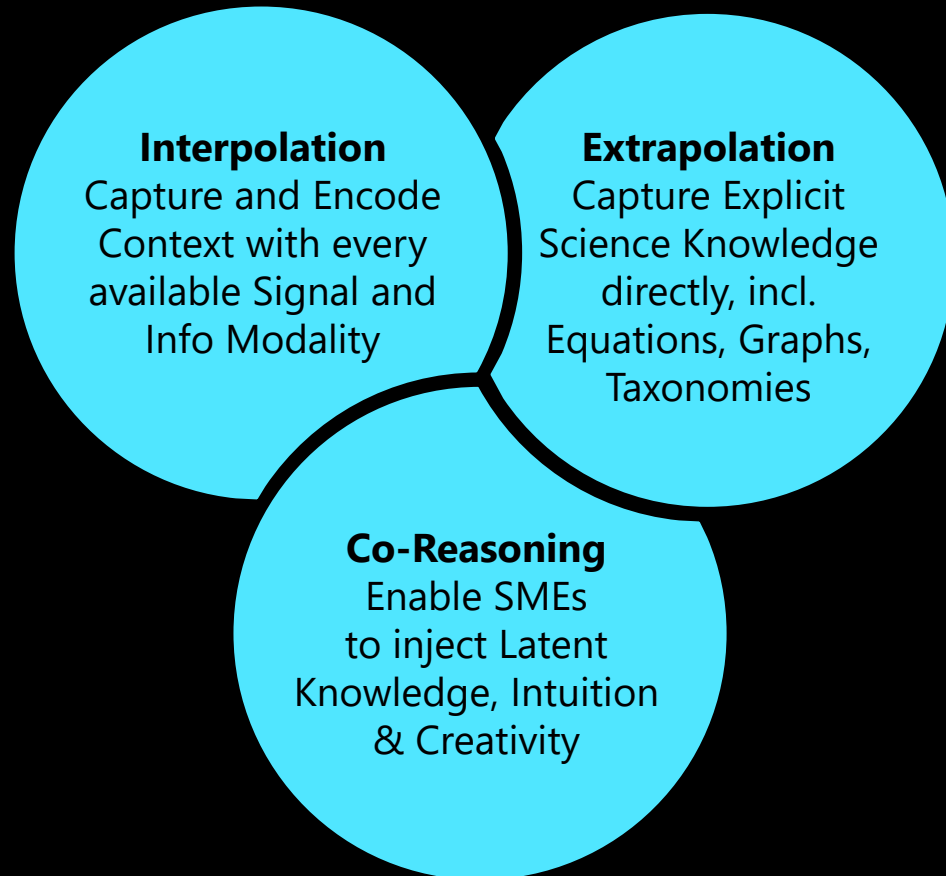
Novel **tools** are required to mainstream precision health.

Cloud platforms that put **interoperability first**, built for **multi modal data management** enhanced by **privacy and security**,

to inform, discover and **translate data** into precision health delivery.



# AI + high performance compute = supercharge the R&D + Delivery cycle



**Foundational models** that bring together information in multiple modalities into a unified context.

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**Representation** and solvers for explicit scientific equations and constraints.

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**Co-reasoning between AI and SMEs**, where the human is at the center, guiding the path of inquiry and conjecture, and injecting tacit knowledge.

# Empowering scientists

*"With the deep knowledge that UCB offers in drug discovery and the knowledge of human biology, together with Microsoft's unmatched expertise in computer science and AI, we have a unique opportunity to reinvent the way new medicines are created."*

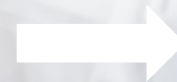


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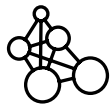
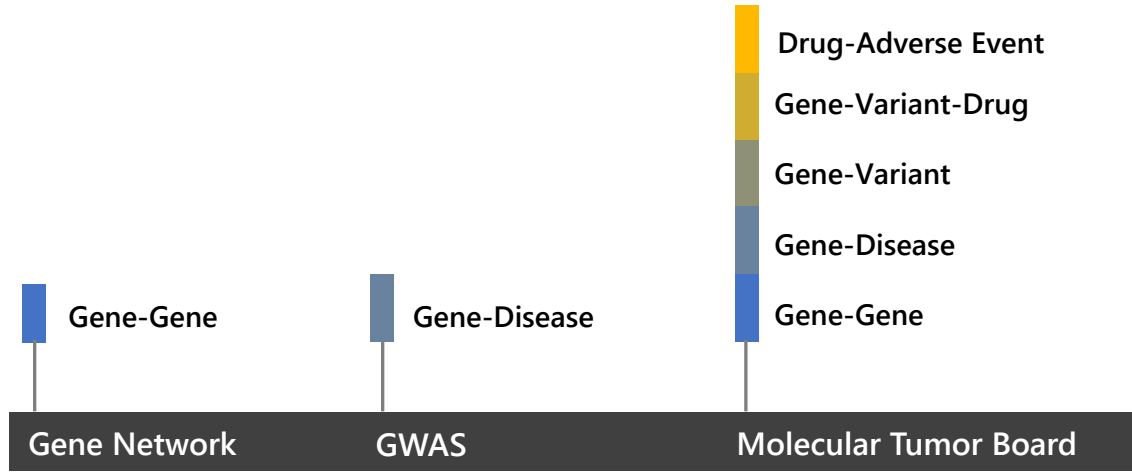
Microsoft

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# RWE & Knowledge Graph

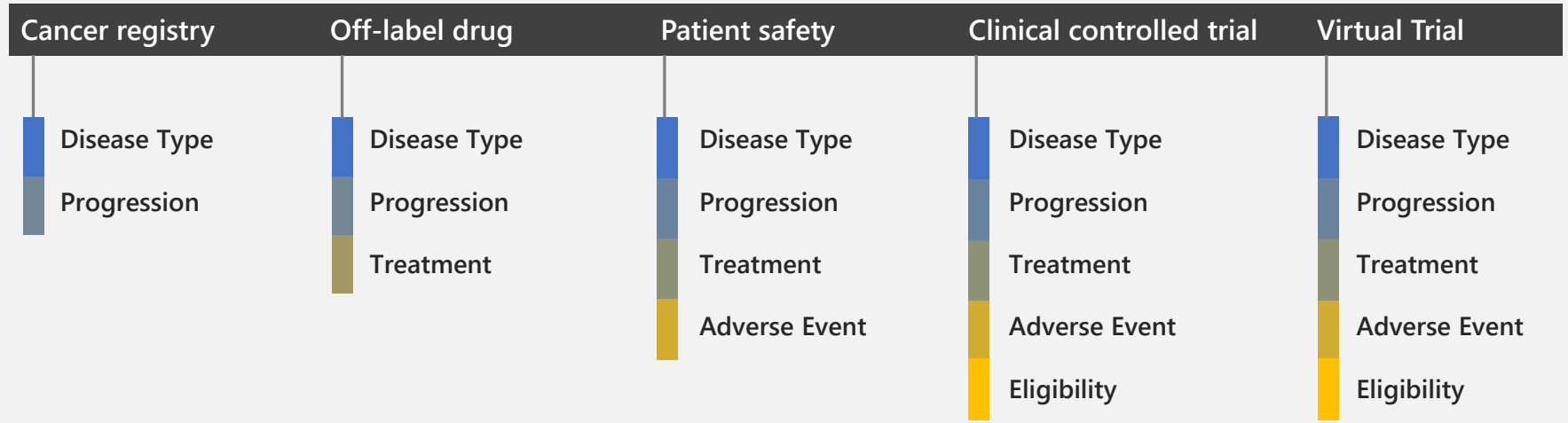
Human-In-The-Loop  
Machine Reading  
Self-Supervision  
Domain-Specific  
Pretraining



PubMed-Scale Knowledge Graph



Real-World Evidence (RWE)





**Self  
Supervised**

**Domain  
Specific**

**Platforms**

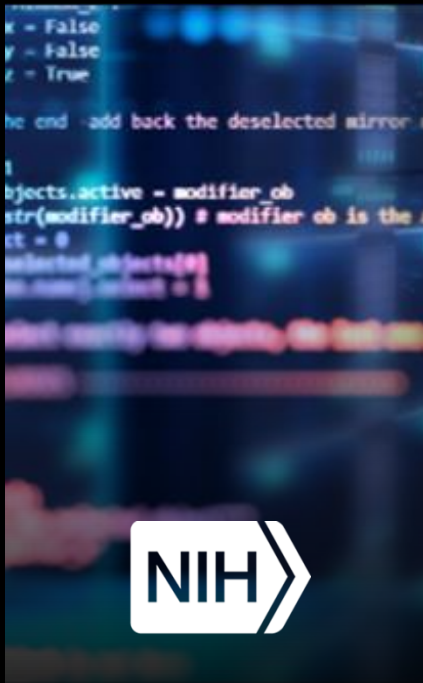
Enables users to **rapidly build their own accurate clinical NLP models**

**Aim:**

**10x productivity**

**Remove need for sophisticated data scientists**

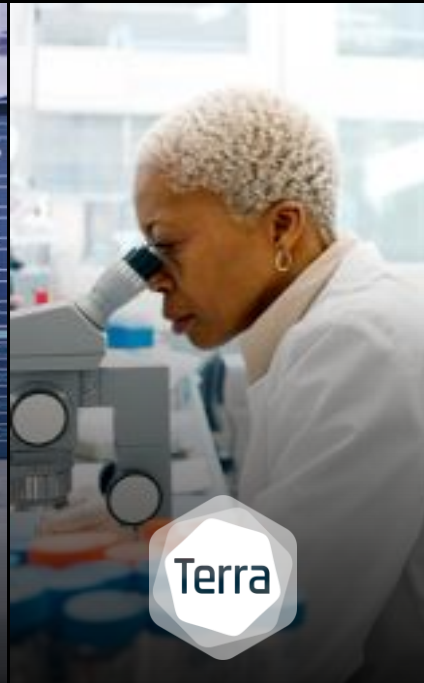
# Precision Discovery Use Cases



Enabling researchers and investigators with cloud resources at effective scale



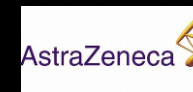
Decoding the response of the immune system to diagnose and treat diseases



Accelerating biomedical research with enhanced governance and secure collab platform Terra.bio

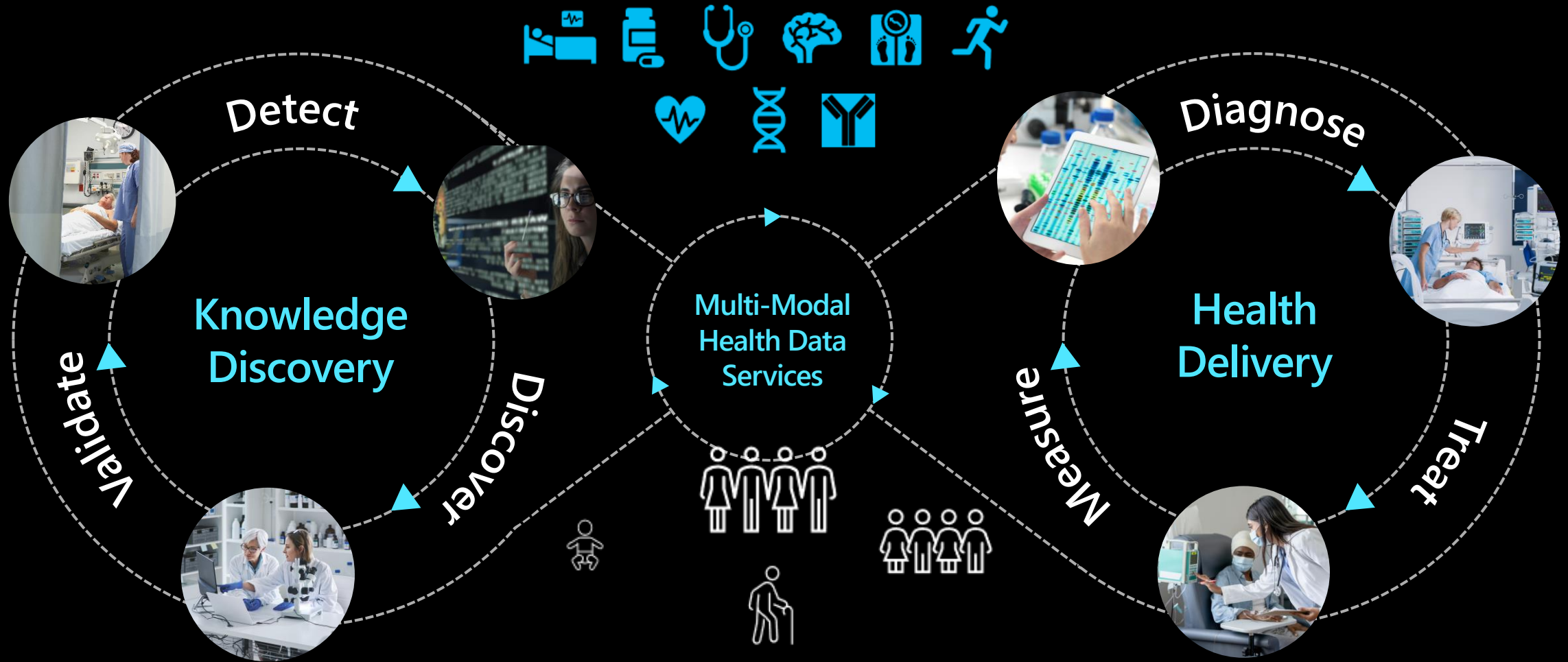


Reimagining cancer care and strengthening cancer registries

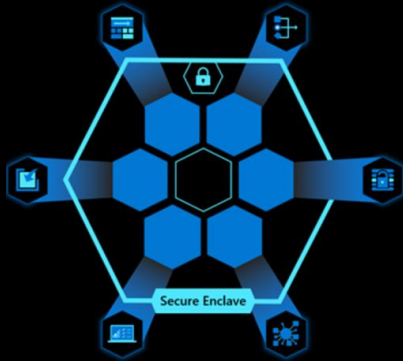


Speeding up drug discovery and increasing the impact of novel treatments

# Precision Health: AI enabled Discovery and Delivery



# Privacy-enhanced platforms enhance collaboration for algorithm owners and data stewards



## BeeKeeper AI



Protected Cloud Storage



Encrypted Primary Data



Healthcare Specific Tools & Workflows



Secure Enclave Technology



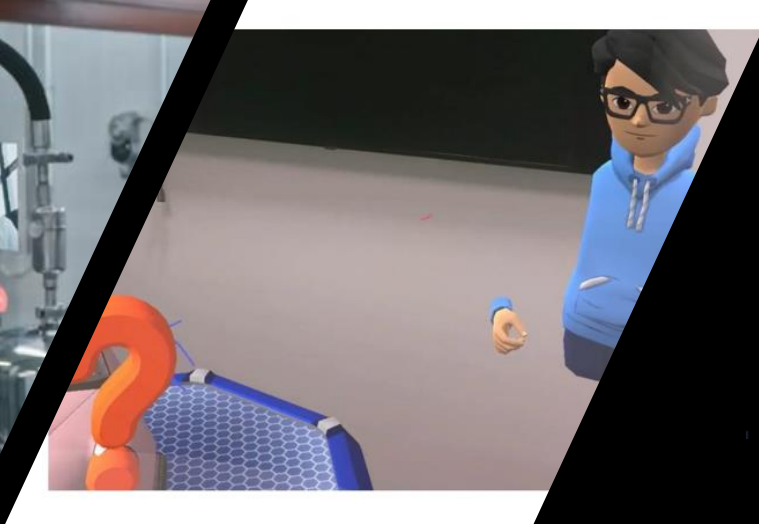
Middleman and Matchmaker

# Trusted Research Environments

Research collaboration is the key to unlocking precision health, and yet data are too sensitive to share openly.

Microsoft Azure provides secure, flexible and governed research environments so collaboration can take place while protecting data & IP.





## Industrial Metaverse:

Enhancing quality, agility  
and collaboration  
from R&D to Supply Chain

# From Real World Data to Real World Action

- Platform that connects data to last mile delivery



## Remove Data Silos

Streamline the ingestion of multi modal data.

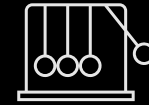
- ✓ Ingest structured data from EMR systems, genomics, and other unstructured data into the cloud.
- ✓ Multi-modal data delivering insights that make precision medicine possible.
- ✓ Get started implementing cloud solutions and a digital health strategy.



## Intelligent Tools to Accelerate AI

Accelerate knowledge discovery with intelligent AI tools.

- ✓ Enable AI/ML models and analytics tools to transform care from being reactive to pro-active.
- ✓ Give data meaning with intelligent tools, and we allow customers to build AI models to accelerate knowledge discovery.



## Last Mile Delivery

Join Jacques Gilbert from Nuance for the AI Action headliner. September 8<sup>th</sup>, 10:45am-11:05am

- ✓ Hear how we are bringing content into the last mile workflow deployment.
- ✓ Nuance + Microsoft are quickening the pace of discovery and utilization by providing decision support for clinicians.



Thank you!



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# Areas of Microsoft investment in Life Sciences



**AI/ML-enabled R&D productivity**  
solutions (Next Gen CT, RWE platform)



**Imaging and analytics platform**



**Next-gen HCP commercial engagement platform**



**Patient engagement platform**



**Industrial metaverse**  
Resilient manufacturing and supply chain solutions



**Integrated healthcare platform** for multi-modal data management (e.g., Interop FHIR, IoT, DICOM)



**Protected health data Privacy enhancing solutions**  
trusted and responsible AI