



# Accelerating Healthcare Innovation with AI

Kimberly Powell, VP of Healthcare

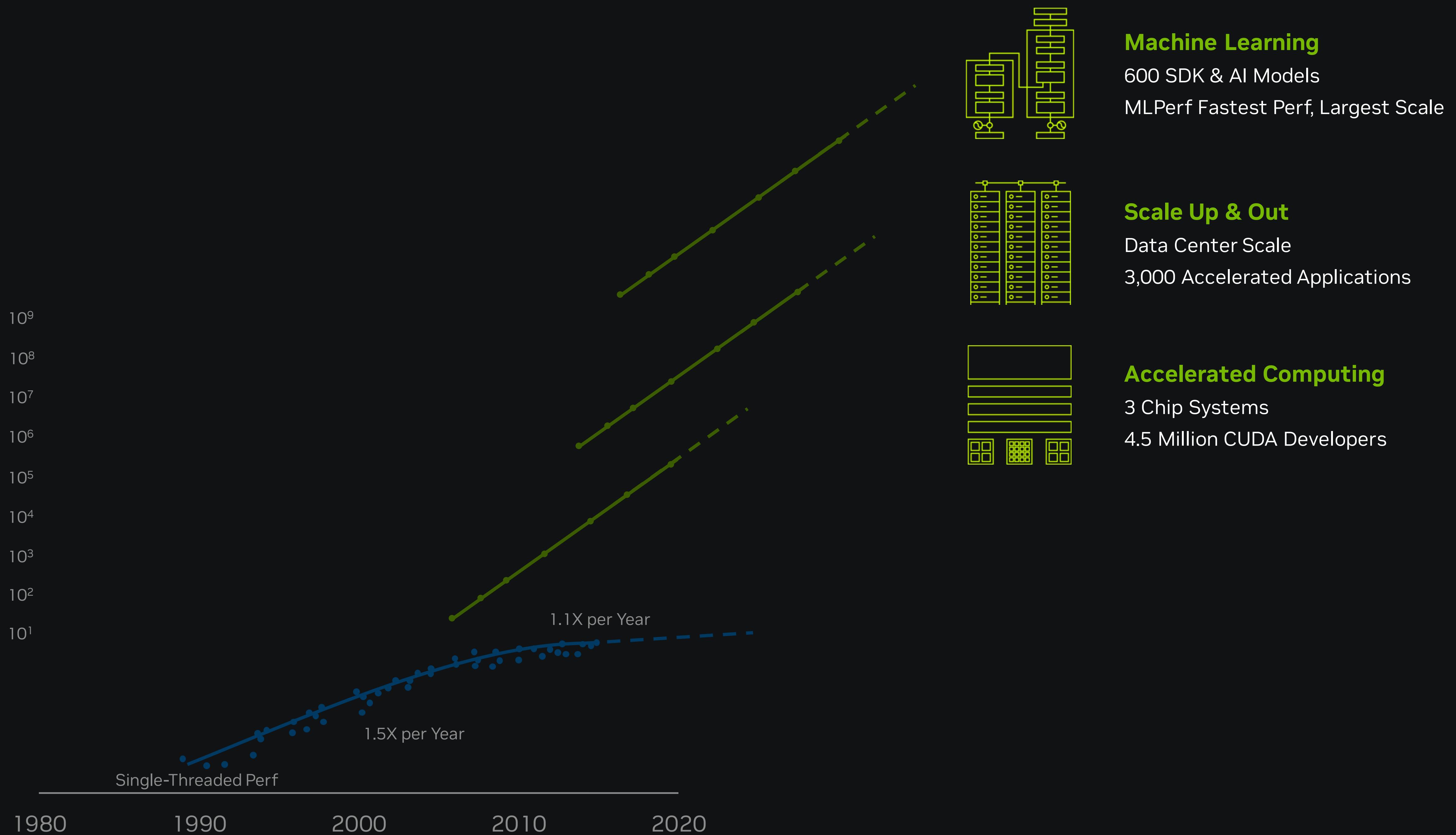
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# A New Era of Computing

Accelerated Computing  
and Generative AI

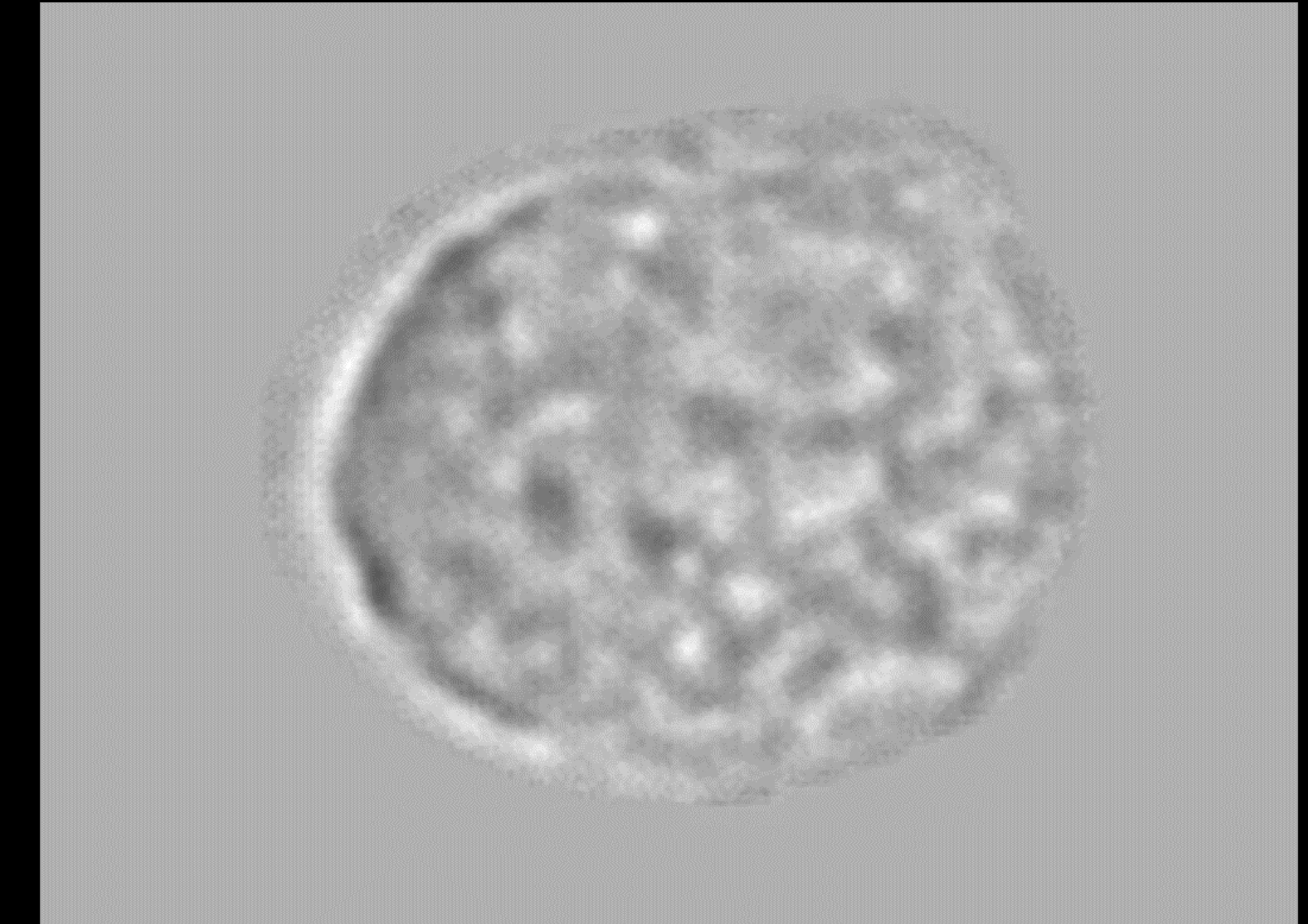


# Digitize Biology

Deepcell – Morpholomics



**REM-I**  
Sorting, Imaging, High-dimensional Analysis



**Single Cell Morphology**  
Cell Size and Shape -> Function

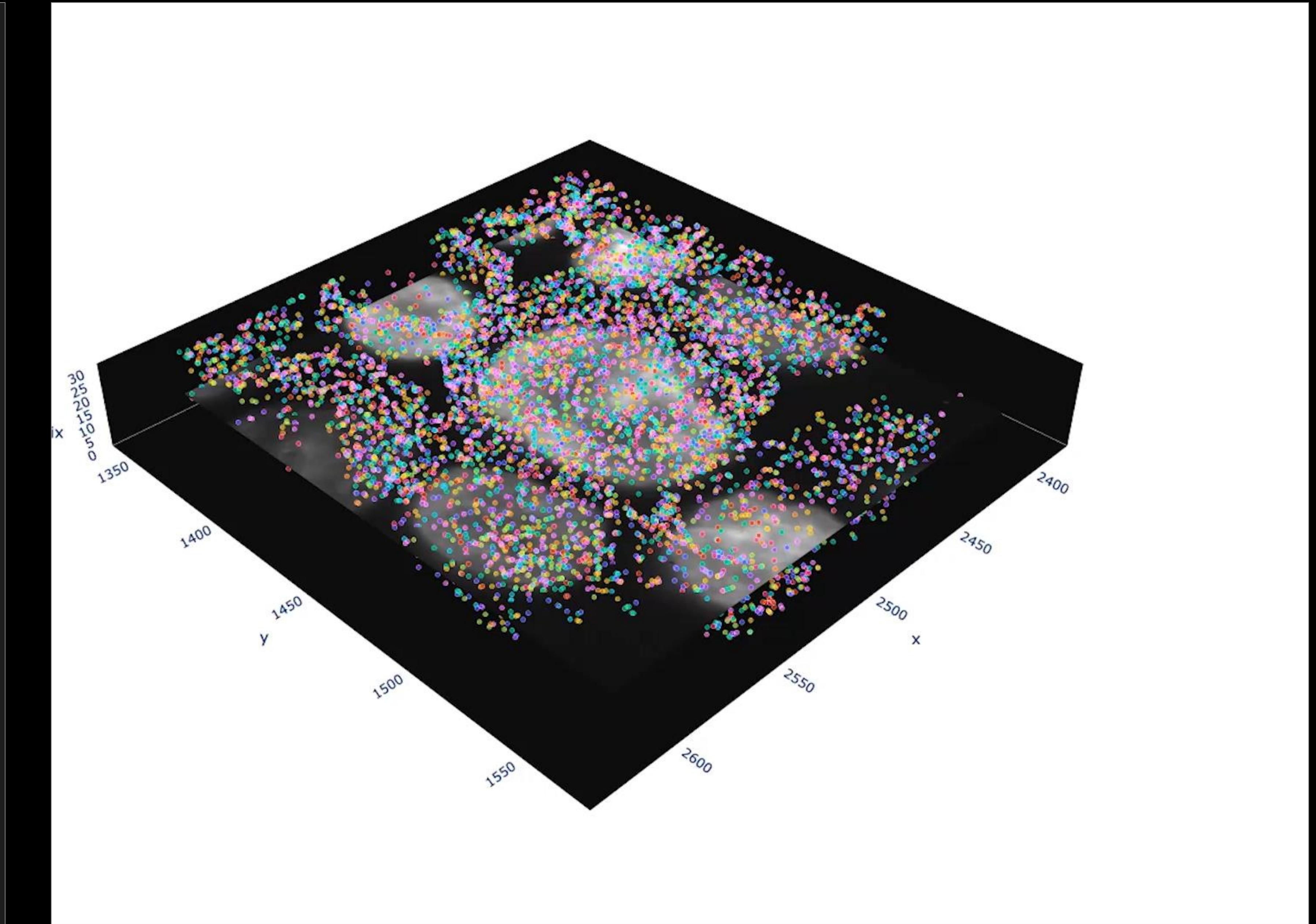
# Digitizing Biology

NanoString – Mapping the Universe of Biology



**CosMx**

1.5M Cells | 6000 RNA and Protein Targets | 6TB per Sample



**Spatial Multiomics Single-Cell Imaging**

Morphologic + Transcriptomic + Proteomic Content in Spatial Context

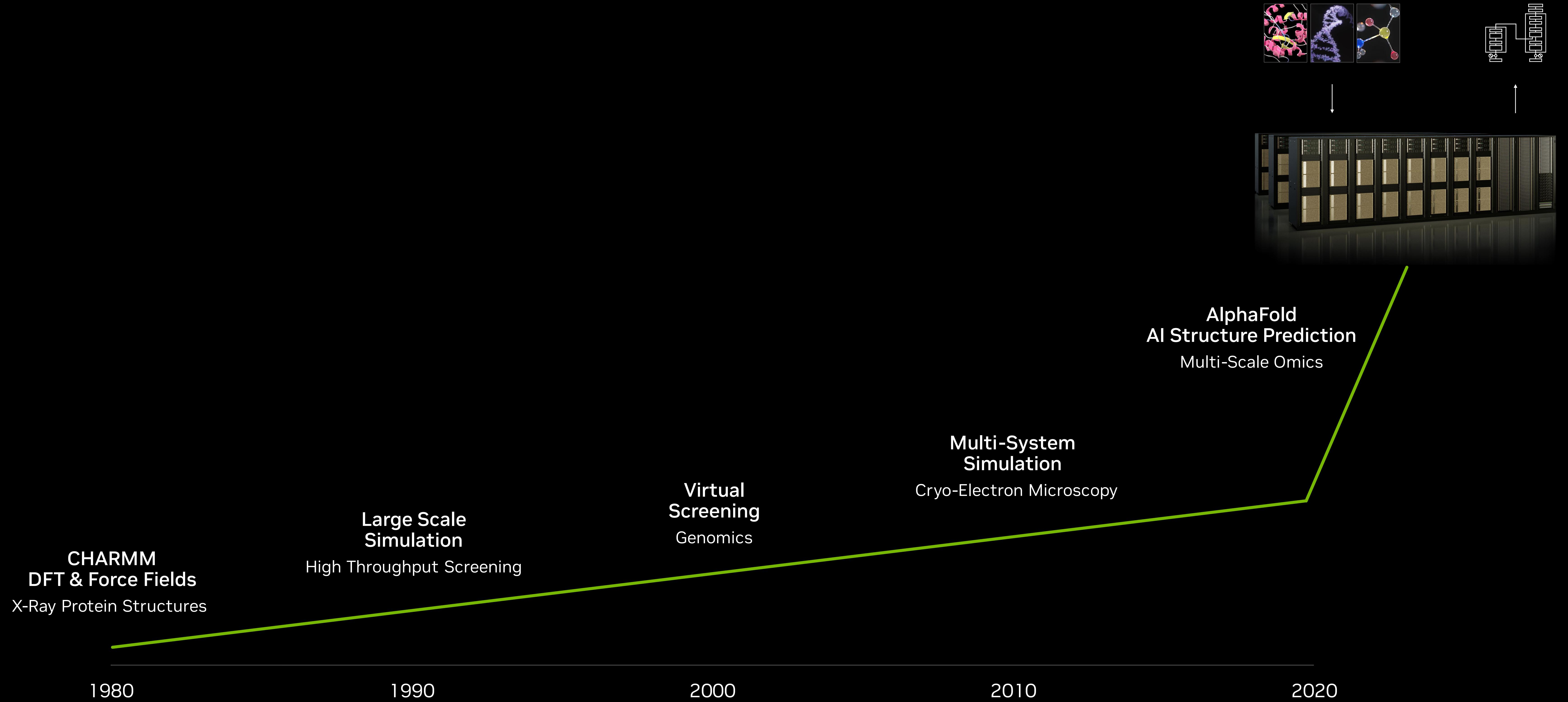
# Representing Biology and Chemistry in a Computer

Generation, Prediction, Interaction, Design



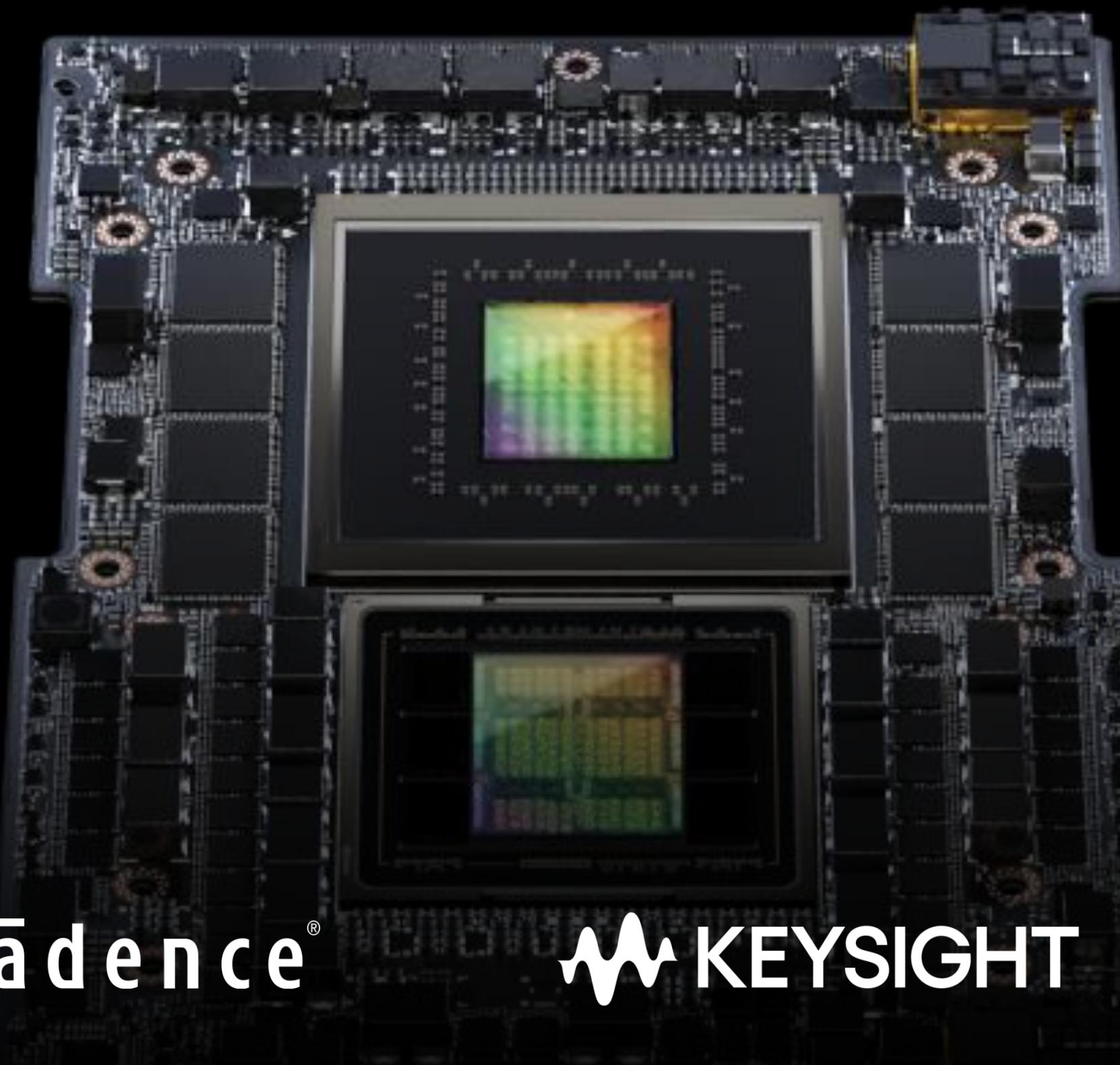
# Drug Discovery Is at an Inflection Point

Computer Aided Drug Discovery is Expanding Exponentially



# What CAD and EDA did for Chip Design

Computer-aided Design Makes Building 100B Transistor Chips In Silico Possible



**Altium**

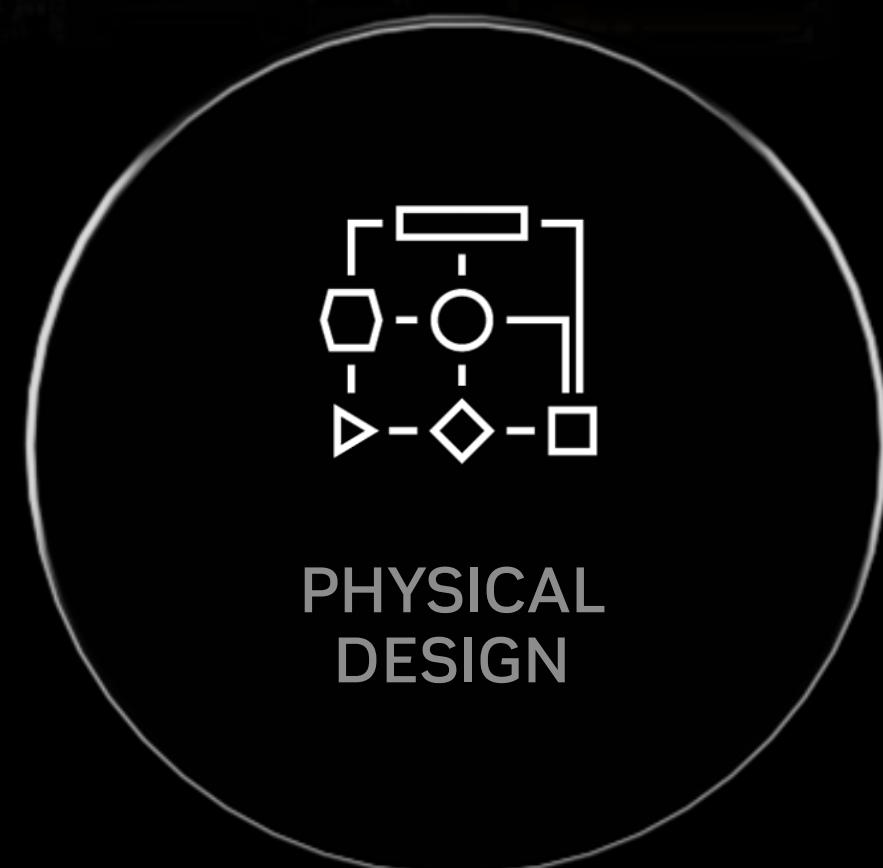
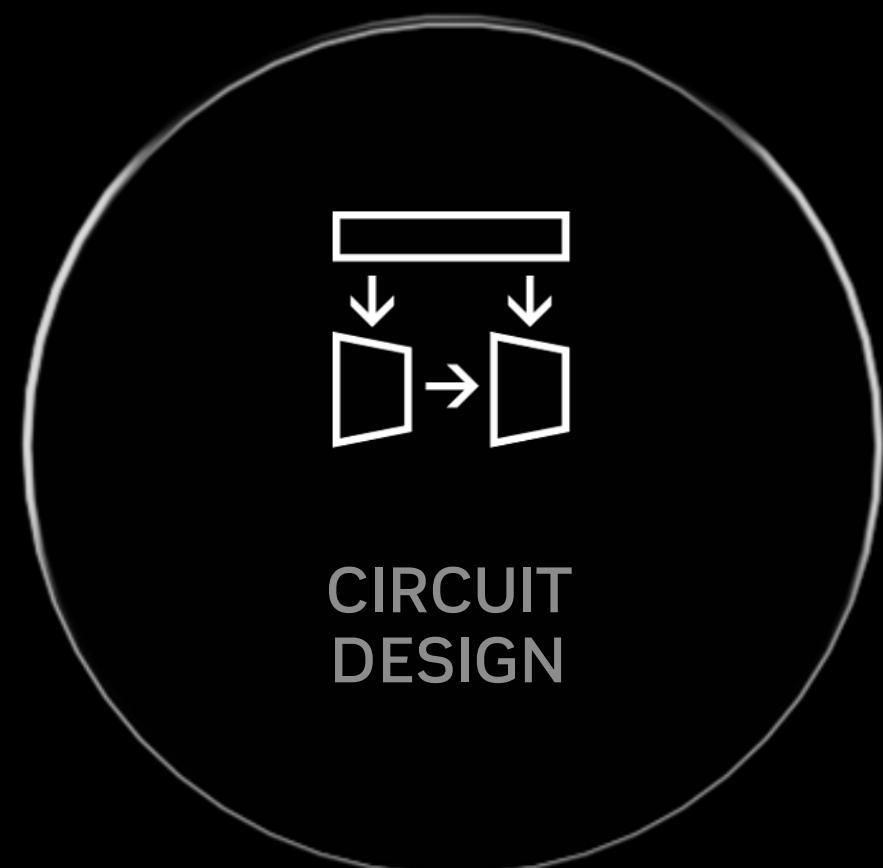
**Ansys**

**cadence®**

**KEYSIGHT**

**Mentor®**  
A Siemens Business

**SYNOPSYS®**



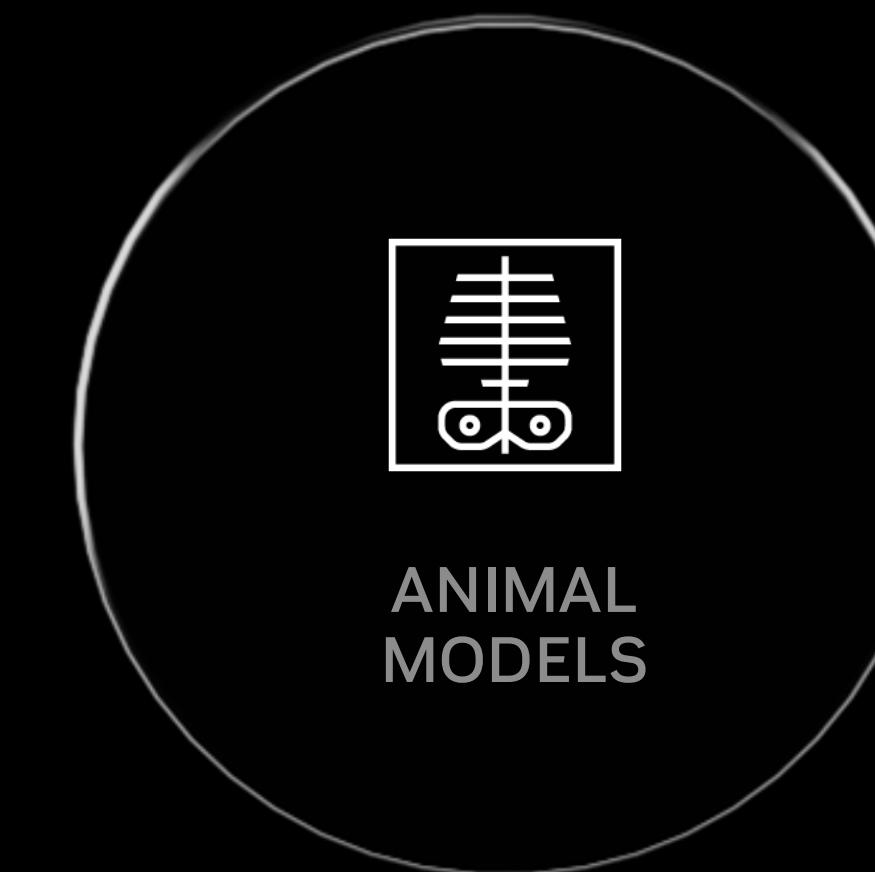
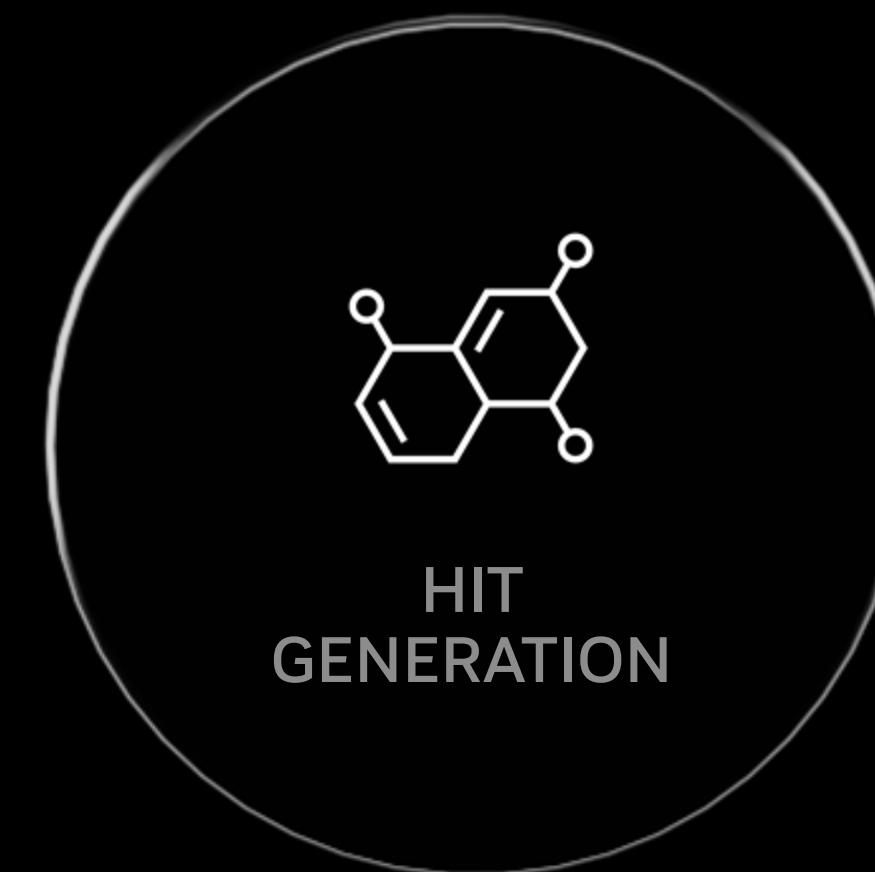
FRONT END

BACK END

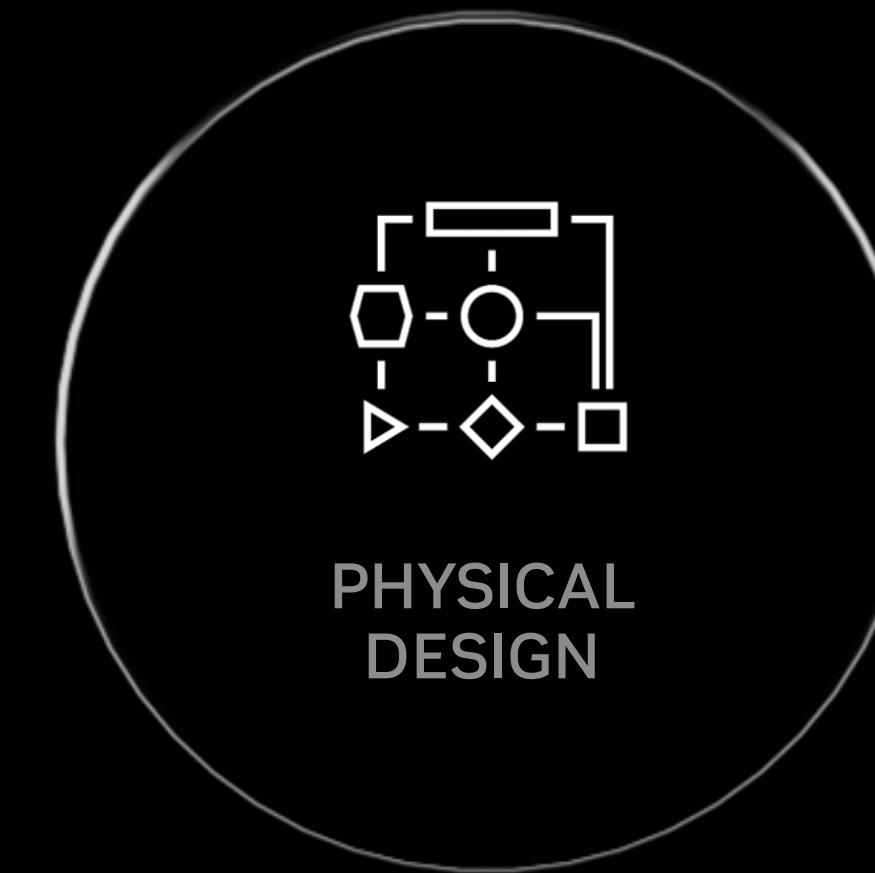
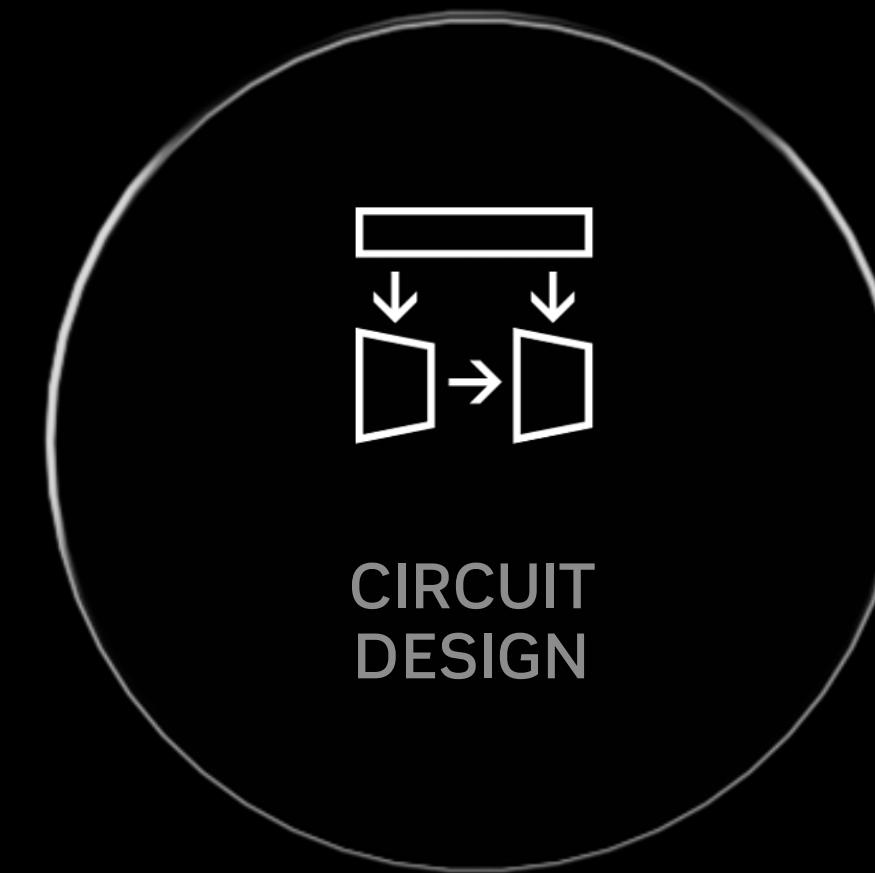
# The CADD Ecosystem Can do for Drug Design

Drug Discovery R&D \$250B Industry

DISCOVERY



DEVELOPMENT



FRONT END

BACK END

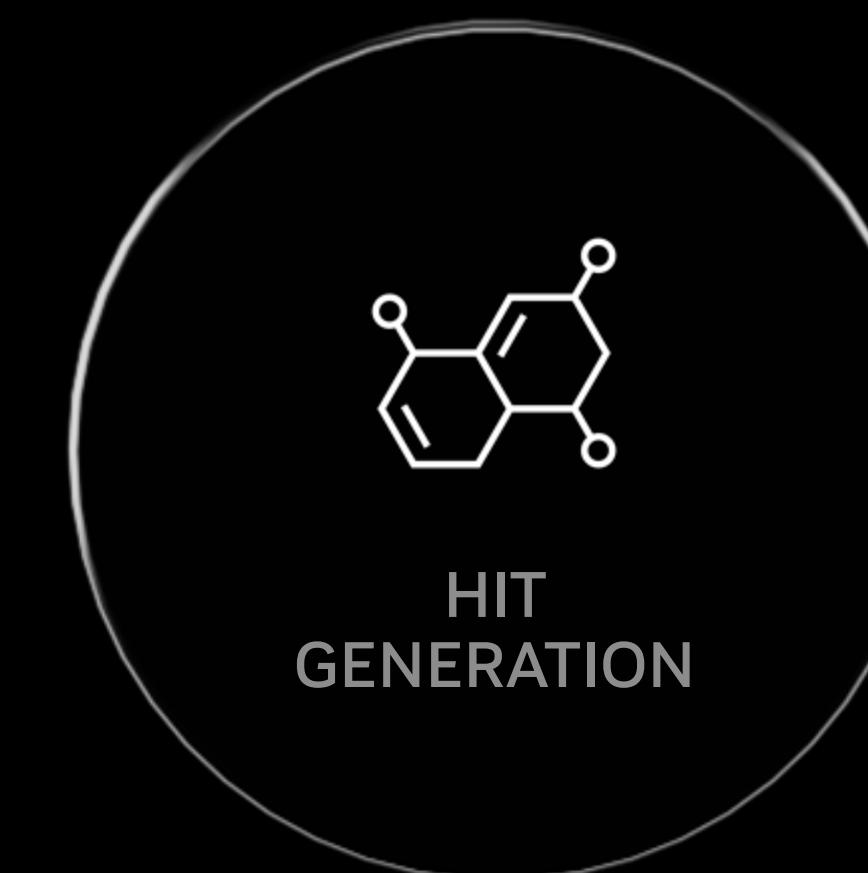
# NVIDIA Clara

## Computer-Aided Drug Discovery Acceleration Platform

DISCOVERY



TARGET  
DISCOVERY



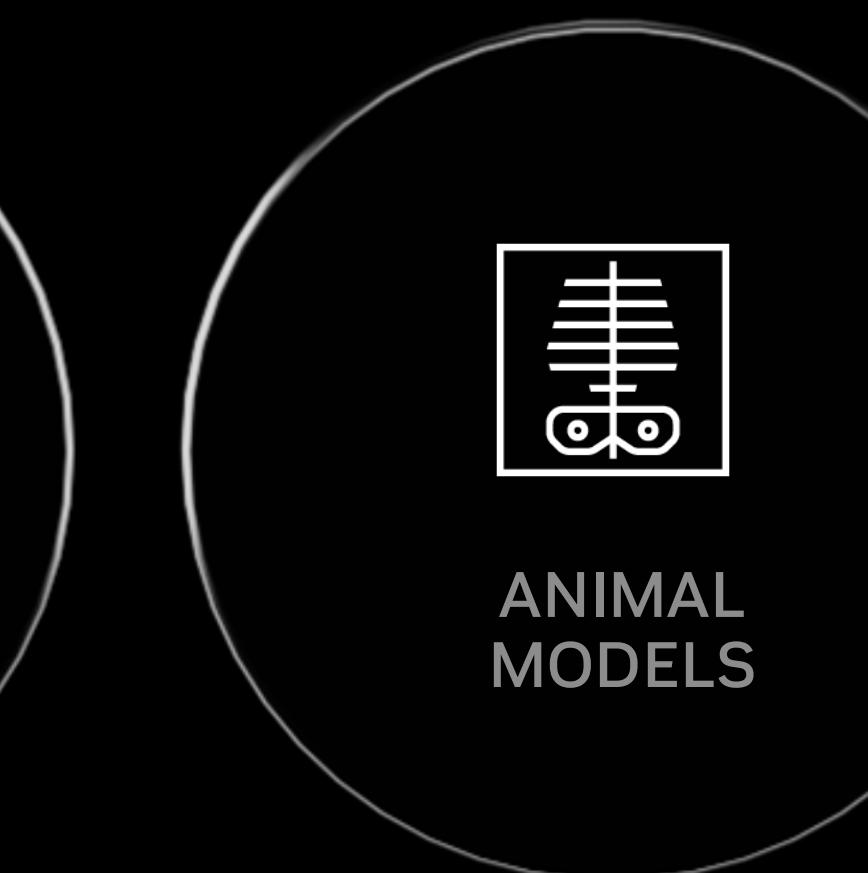
HIT  
GENERATION



LEAD  
IDENTIFICATION



LEAD  
OPTIMIZATION

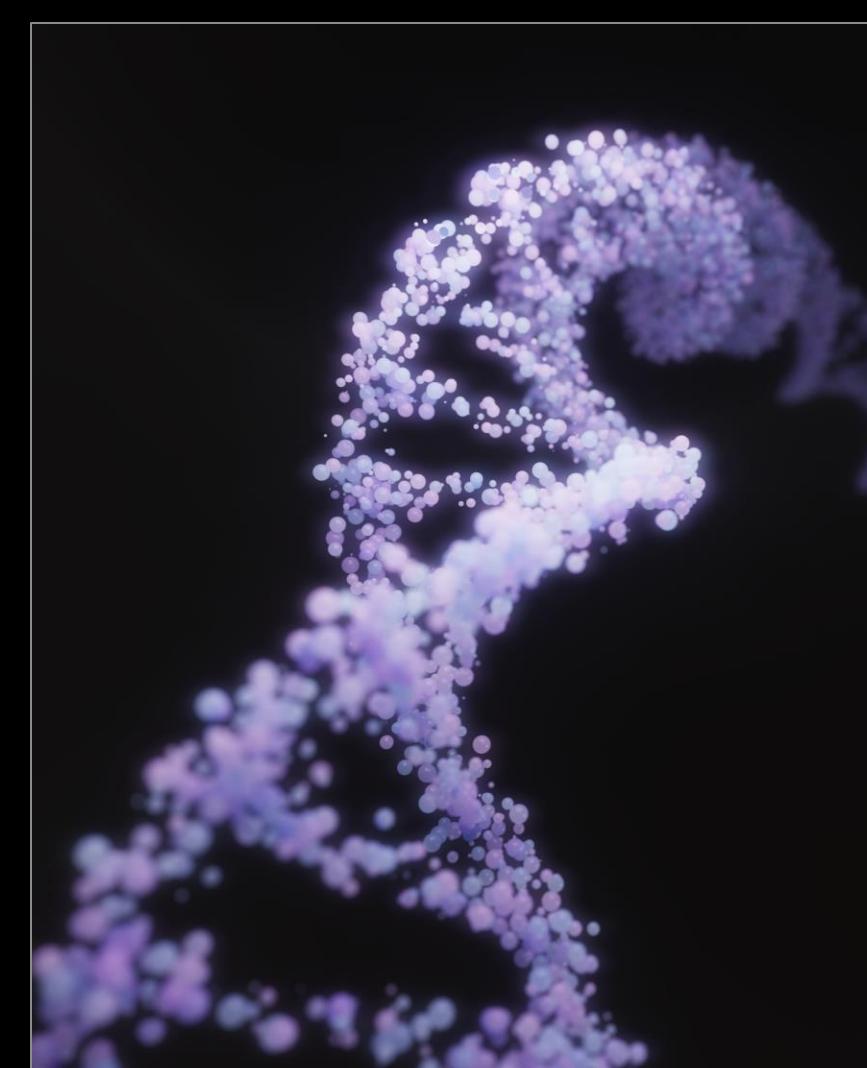


ANIMAL  
MODELS

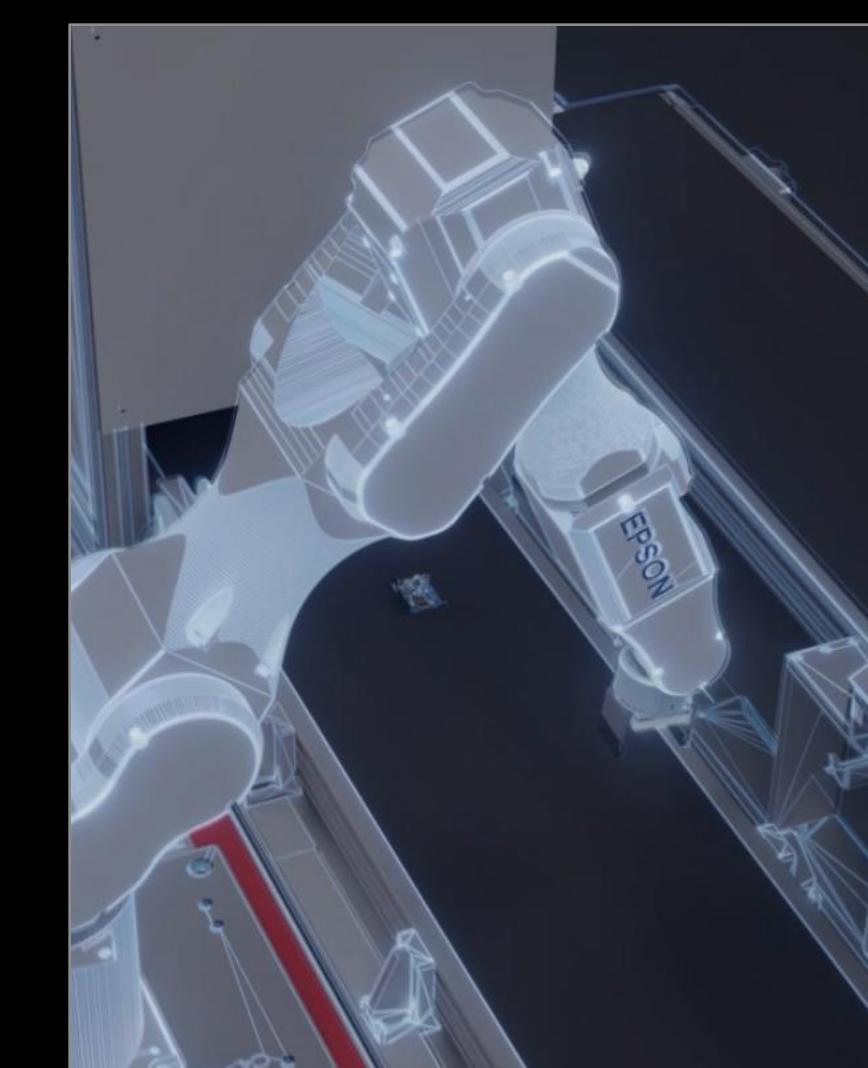


CLINICAL  
TRIALS

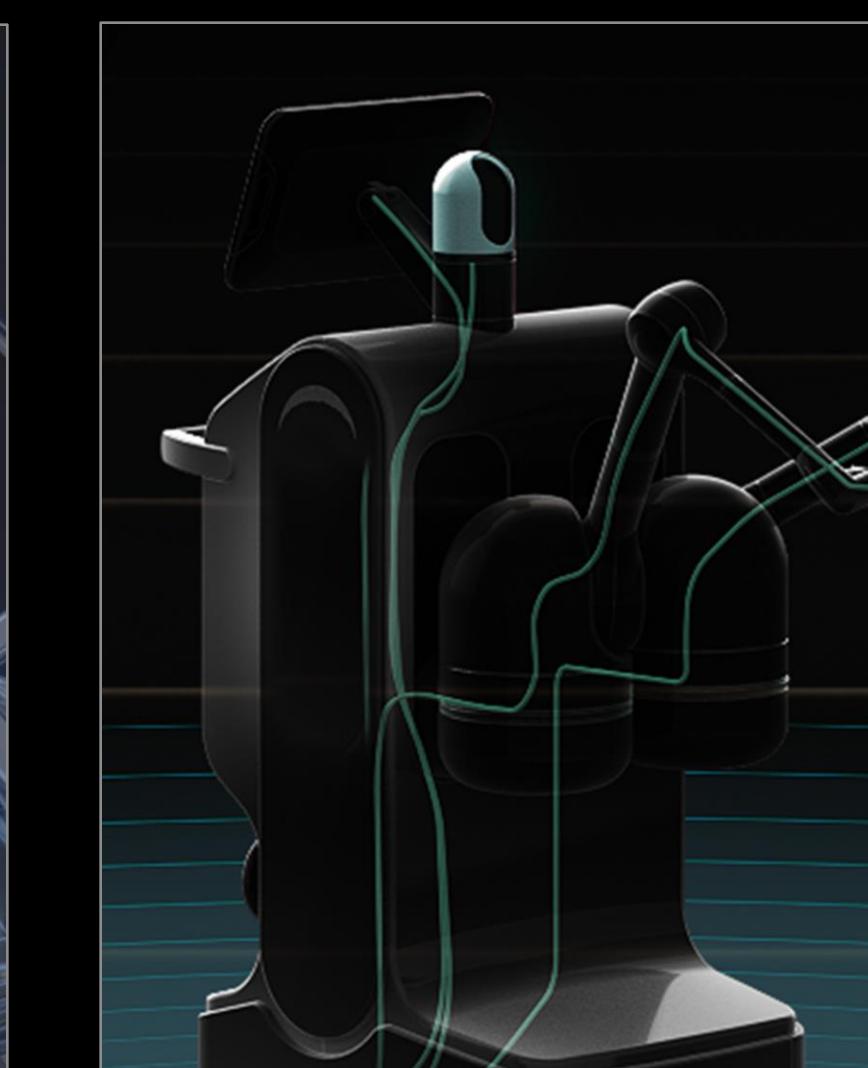
DEVELOPMENT



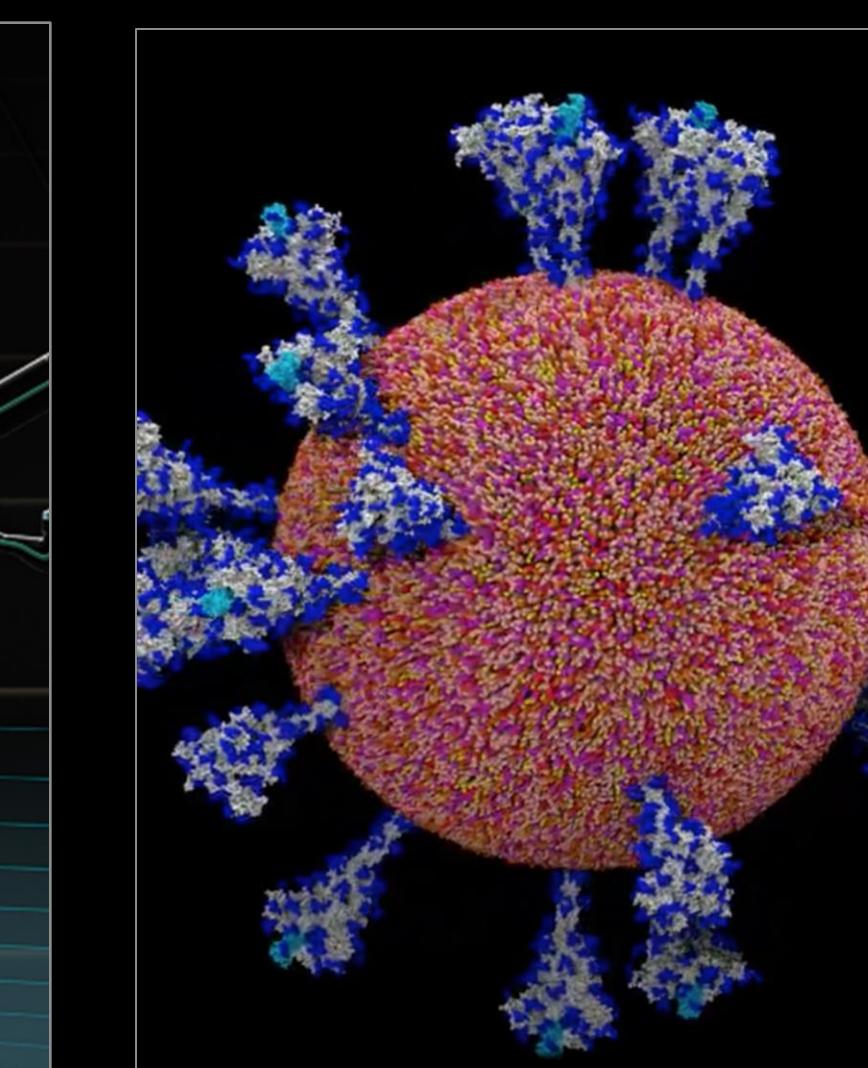
PARABRICKS  
Genomics



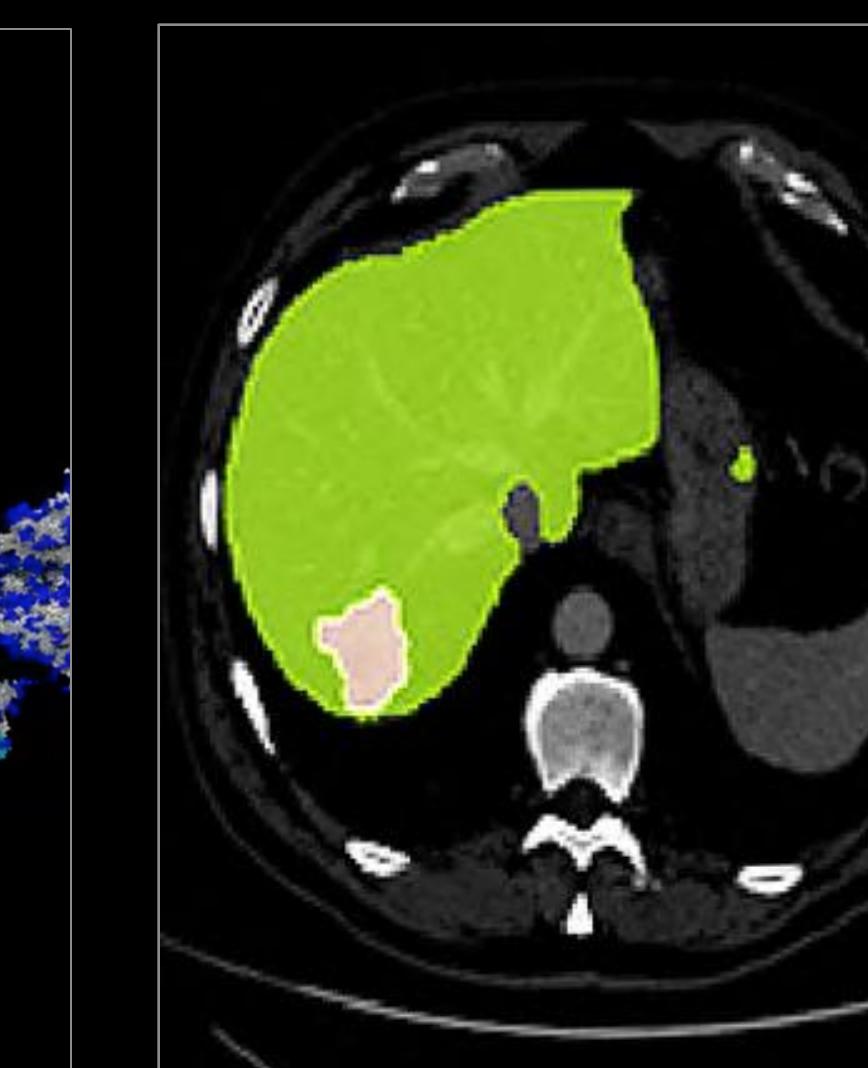
ISAAC  
Robotics



HOLOSCAN  
Instruments



BIONEMO  
Biomolecules



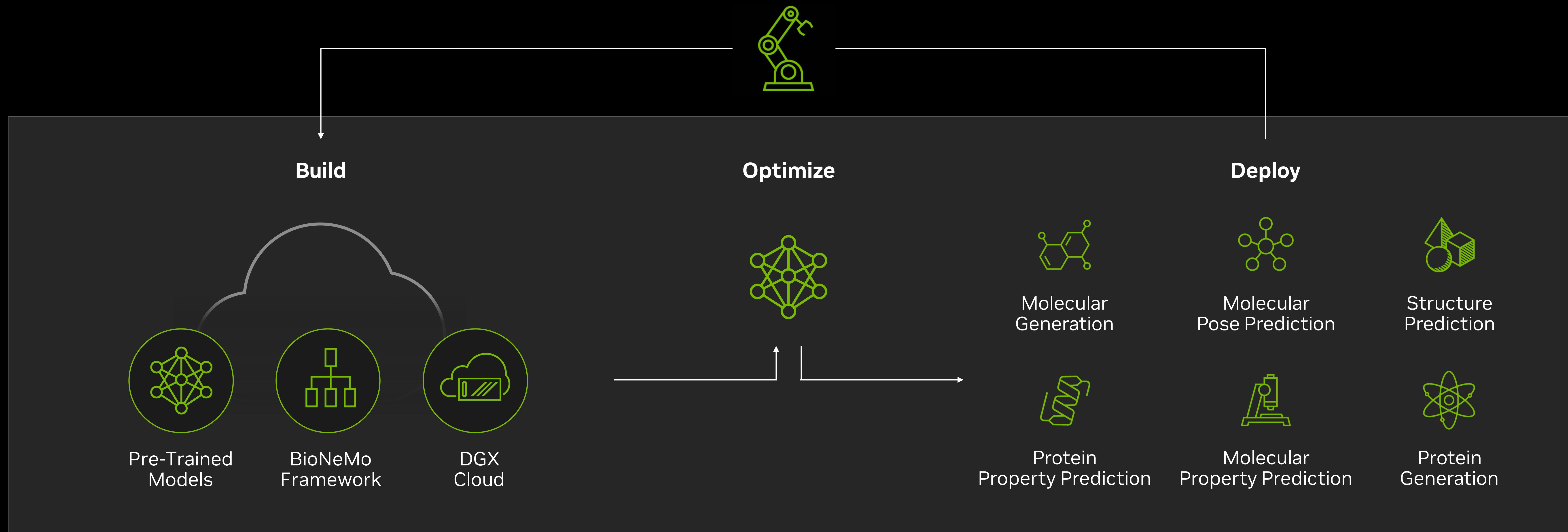
MONAI  
Imaging



NEMO  
Natural Language

# NVIDIA BioNeMo

Build, Optimize and Deploy Foundation Models for Computer-Aided Drug Discovery

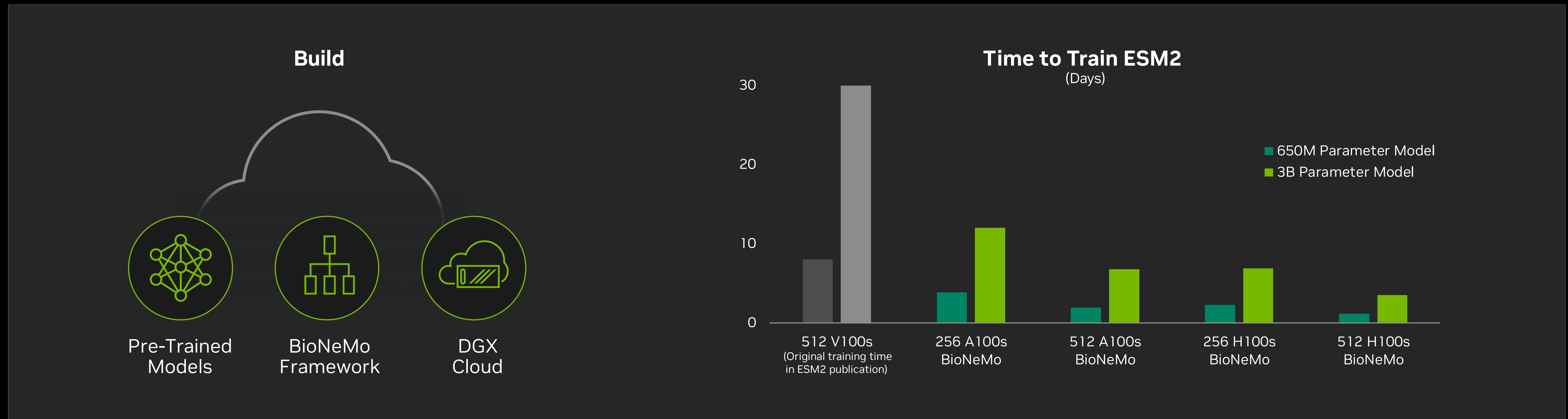


NVIDIA DGX Cloud

aWS Google Cloud Microsoft ORACLE CLOUD Infrastructure Azure

# NVIDIA BioNeMo

Training-as-a-service | Train Billion Parameter Models in Days vs Months



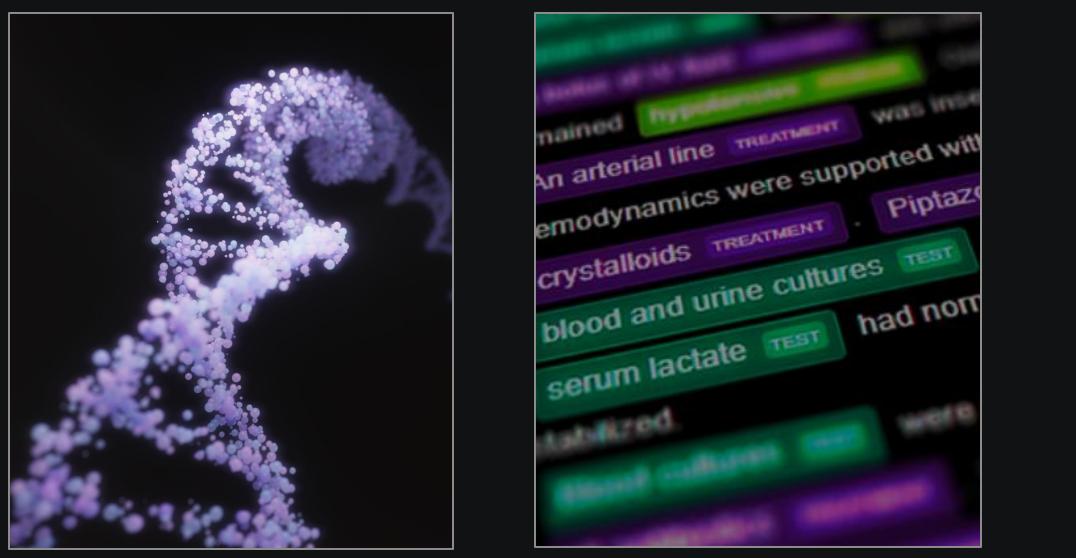
NVIDIA DGX Cloud

aWS Google Cloud Microsoft ORACLE CLOUD Infrastructure Azure



# Announcing Amgen Building Generative AI Models in the Search for Novel Human Data Insights and for Drug Discovery

Powered by —  
NVIDIA DGX H100 and BioNeMo



# Announcing BioNeMo Service Now in Beta

Adopted by Leading CADD Partners

12 Models Deployed as Cloud APIs

Optimized Runtime

Dynamic Scaling

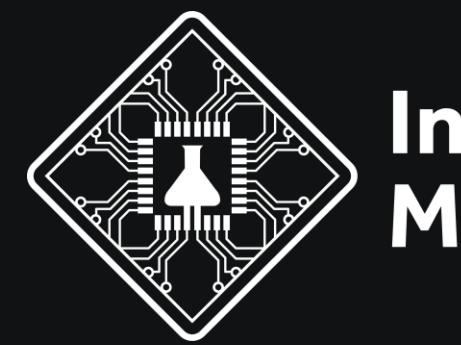
Stable APIs

Enterprise Support

1Å OneAngstrom

**Deloitte.**

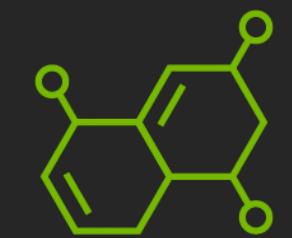
 Recursion.



Insilico  
Medicine

Innophore

T E R R A Y



Molecular  
Generation & Embeddings



Molecular  
Pose Prediction



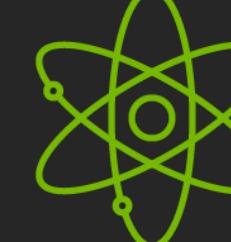
Omics  
Embeddings



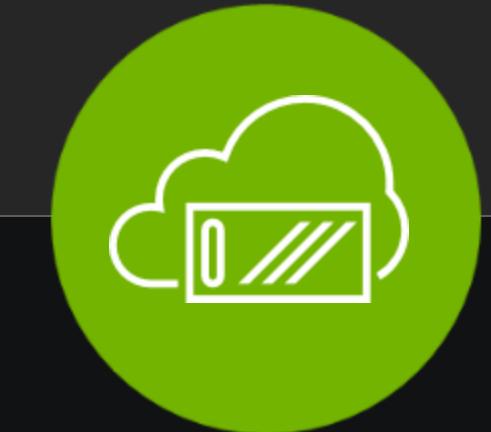
Protein  
Embeddings



Structure  
Prediction



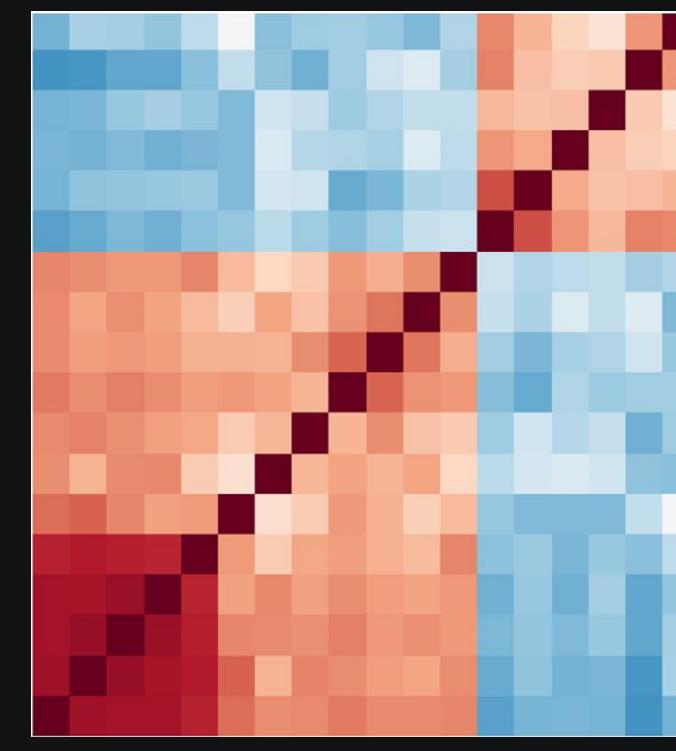
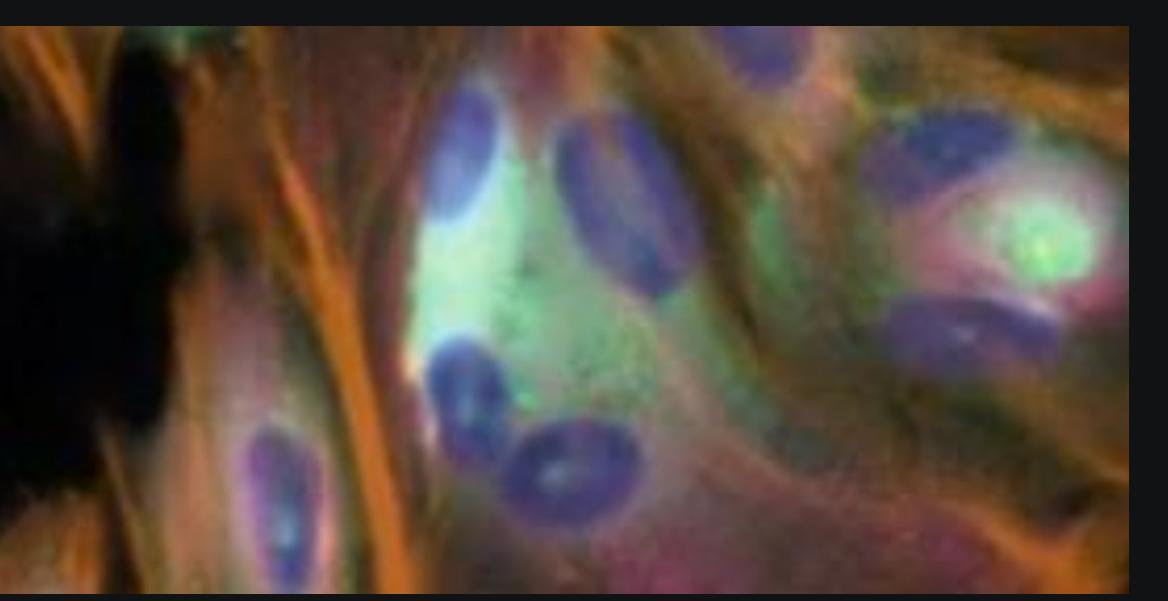
Protein  
Generation<sup>2</sup>



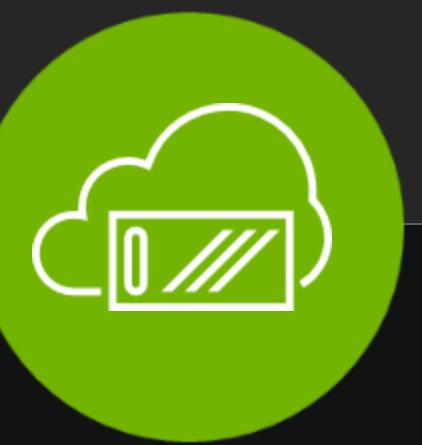


# Announcing Recursion Phenom-Beta Available in BioNeMo

Foundation Model for  
Target and Hit Discovery

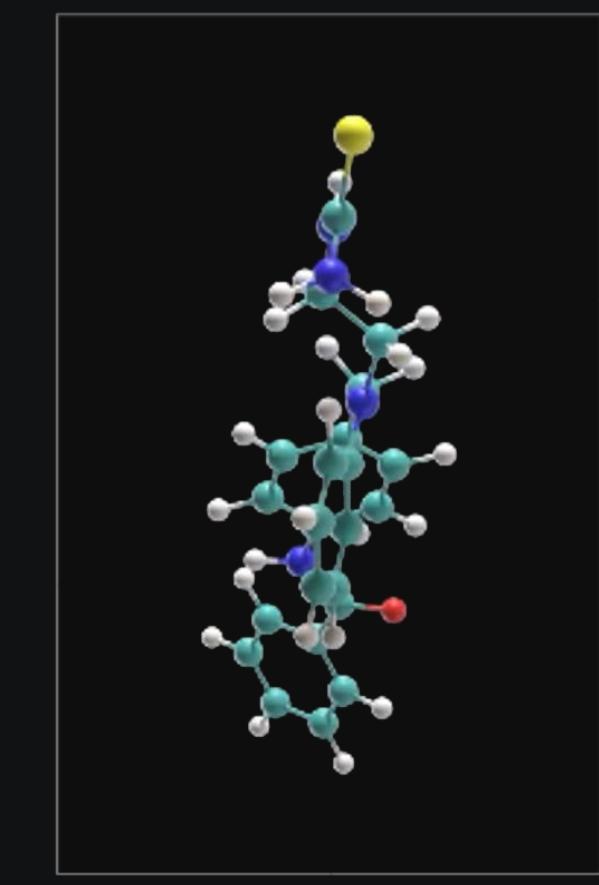


Recursion Phenom-Beta  
Molecular & Cell Phenomics



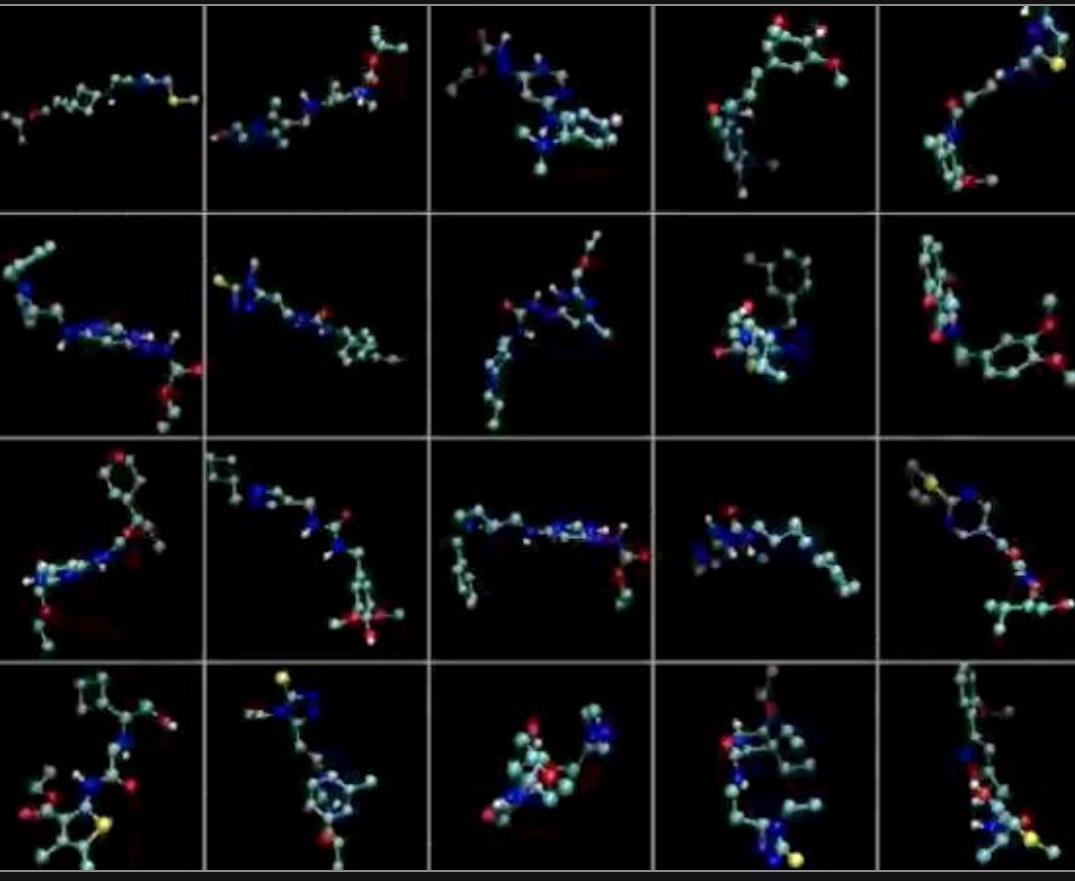
# Announcing NVIDIA MolMIM Controlled Molecular Generation

Foundation Model for Lead Optimization

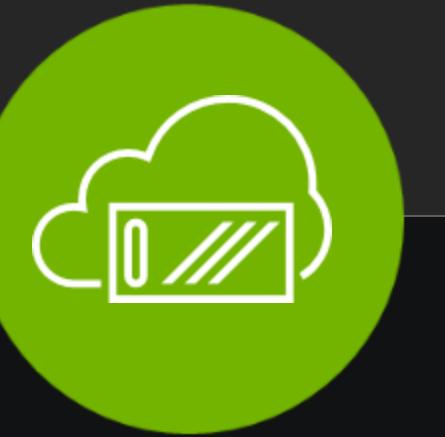


NC(=S)NCCN(Cc1ccc  
(NC(=O)c2ccccc2)cc  
1)c1ccccc1

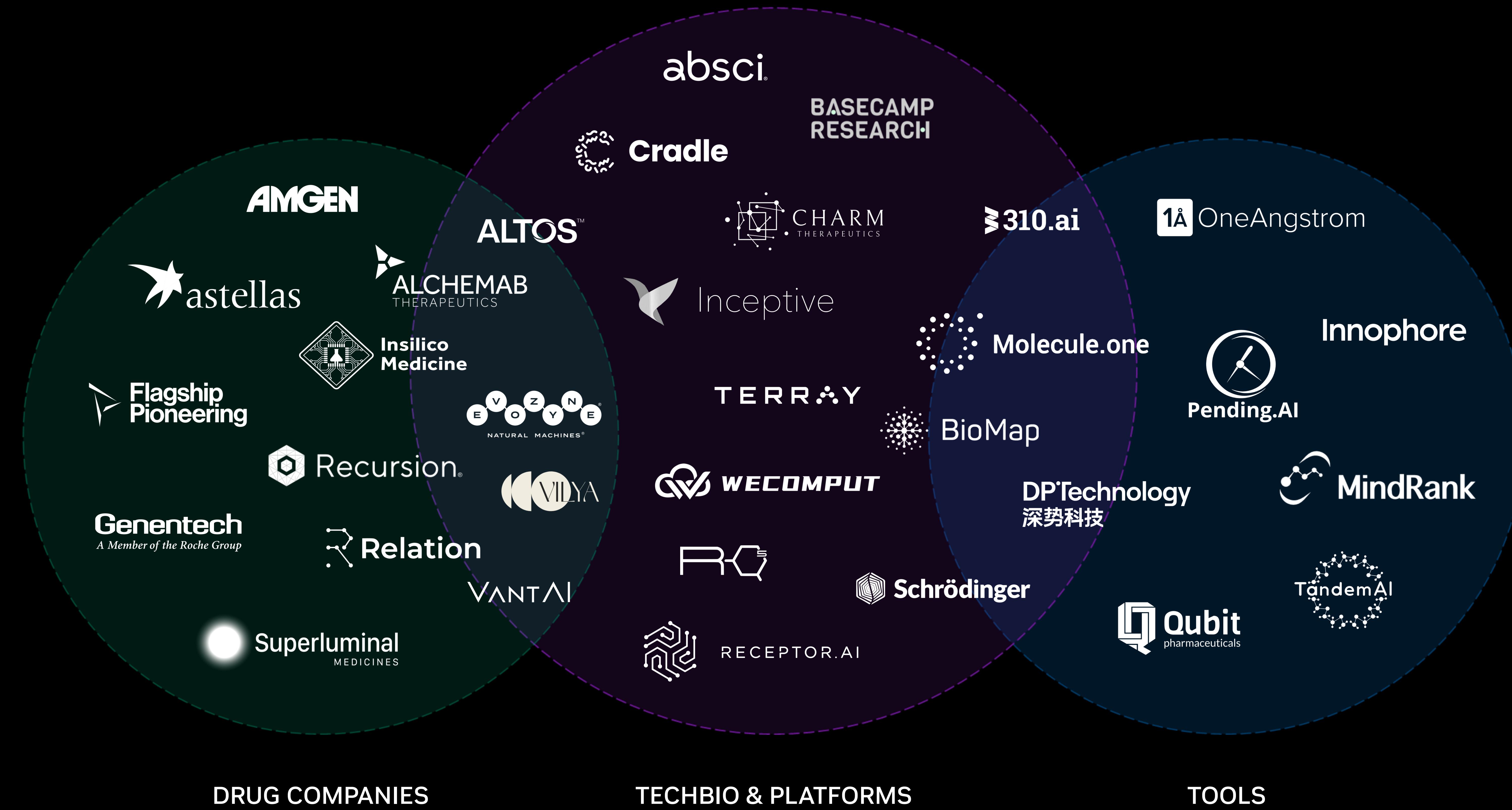
f



NVIDIA MolMIM  
Controlled Molecular  
Generation

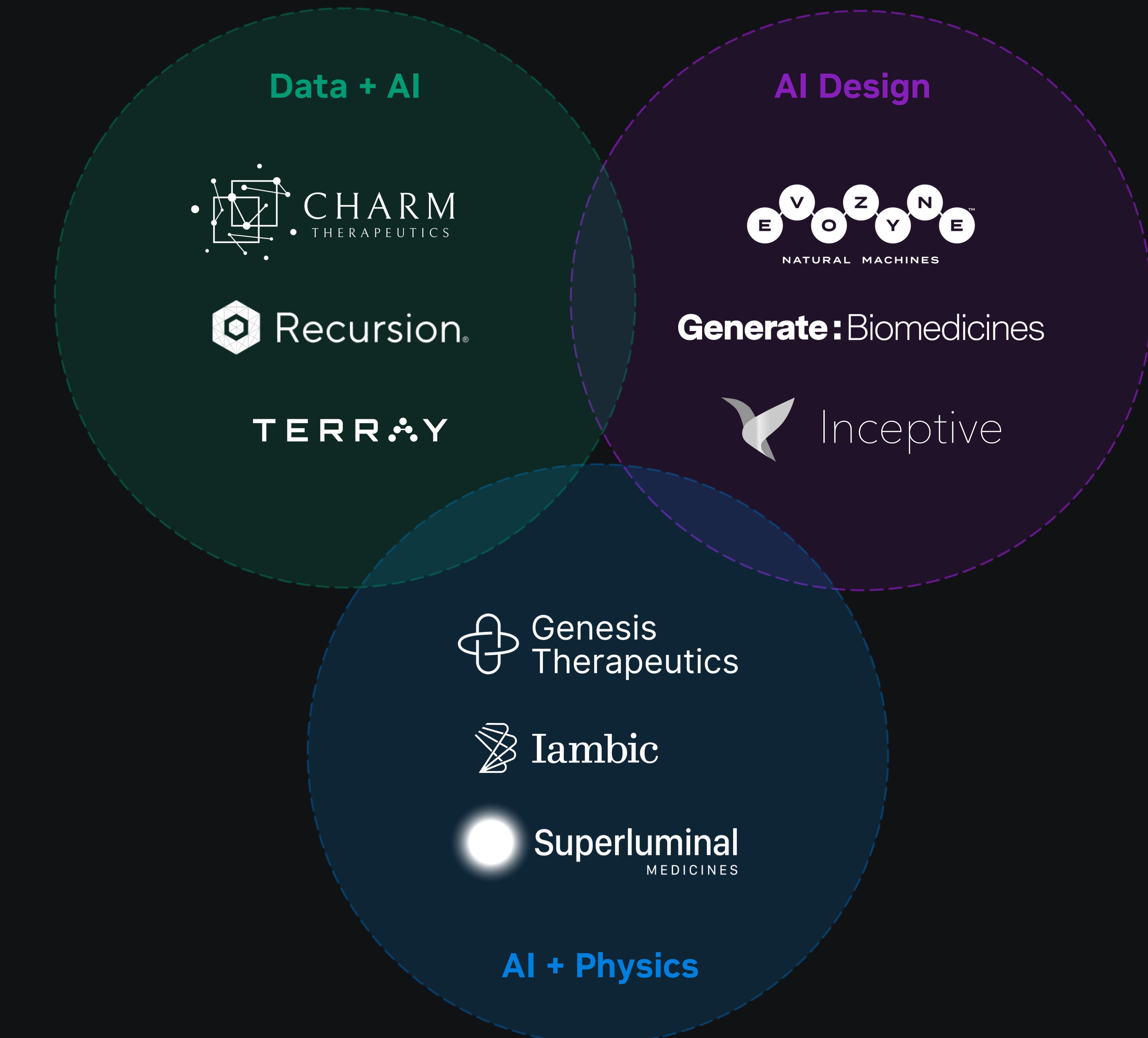


# NVIDIA BioNeMo Next Generation Drug Discovery Ecosystem



# NVIDIA Healthcare Investment Strategy

Use, Enhance, Expand NVIDIA's Platform

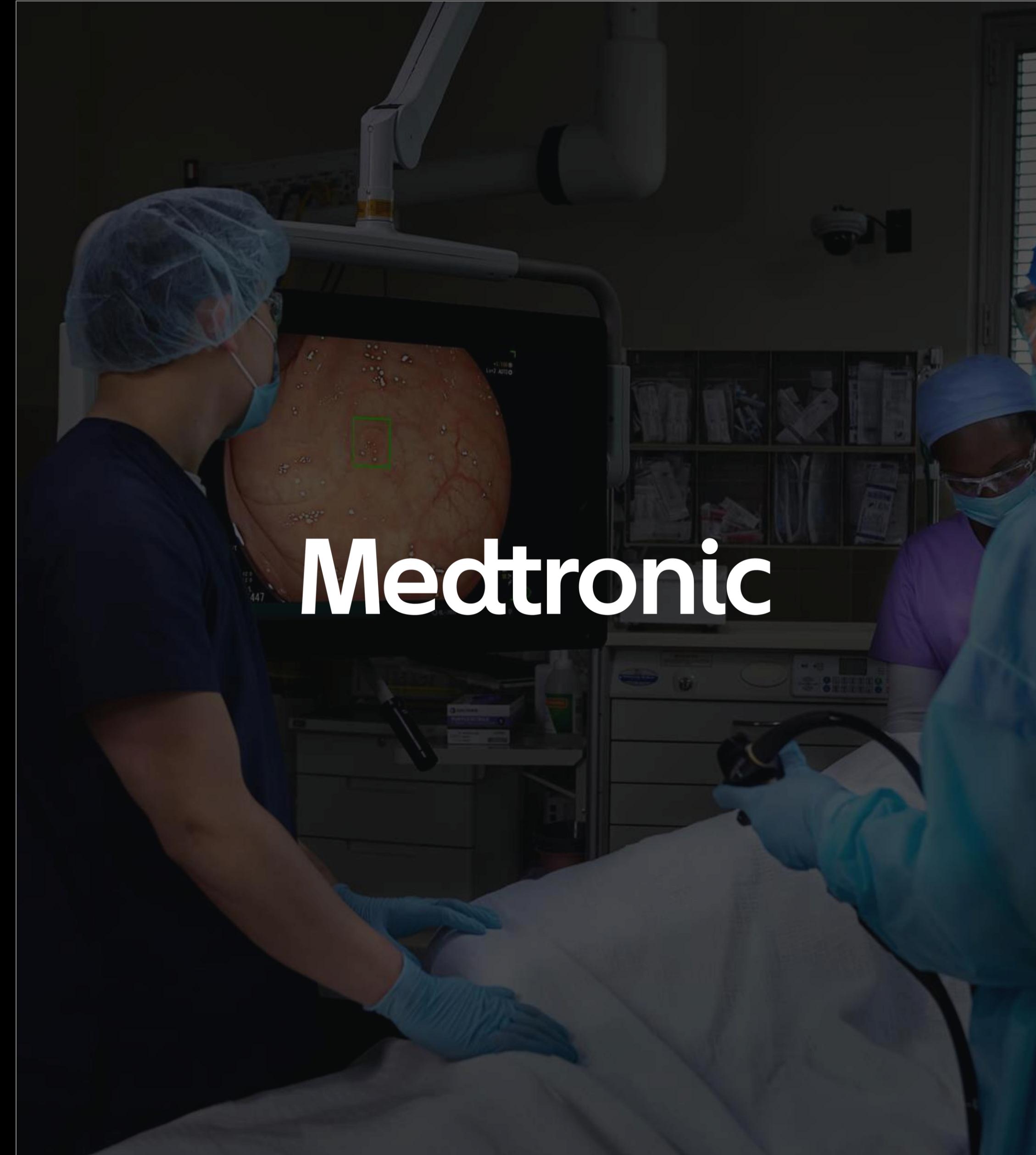


# NVIDIA Healthcare 2023 Milestones



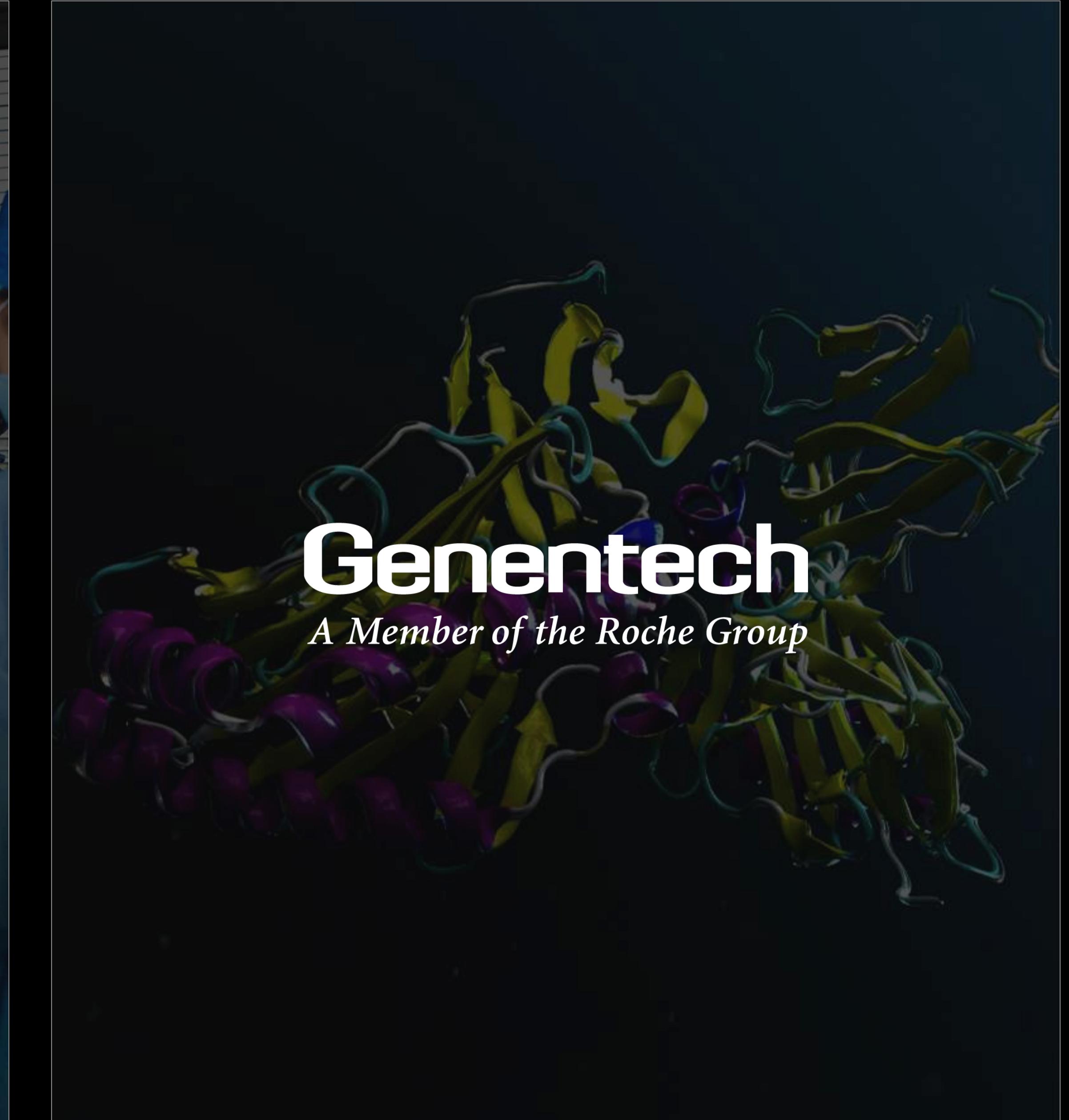
## Adopt NVIDIA BioNeMo & DGX Cloud

Generative AI to design and predict properties of proteins, accelerating drug discovery



## Adopt NVIDIA Holoscan

Building AI platform for medical devices and Medtronic's real-time AI endoscopy device

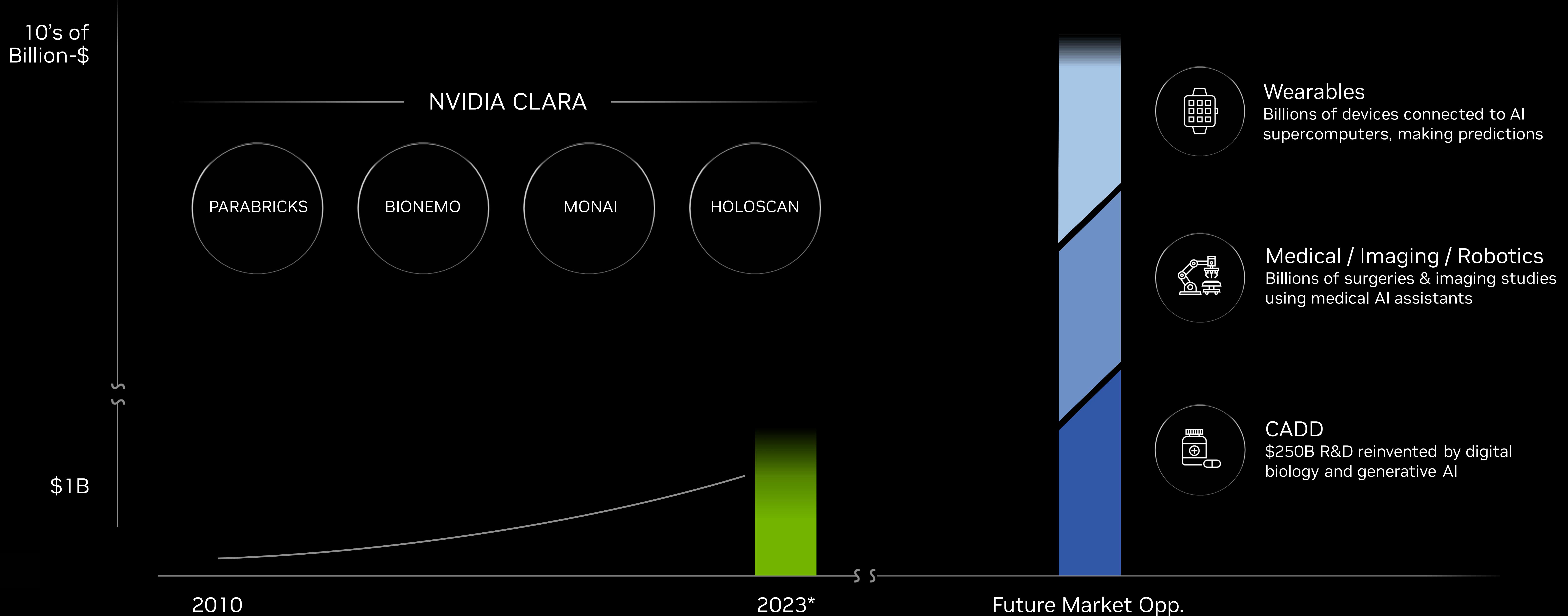


## Strategic AI Research Collaboration

Accelerate generative AI models and algorithms into a next-generation AI platform

# AI Opens Healthcare To Become a Technology Industry

Healthcare Partners & Customers Consume >\$1B in NVIDIA GPU Computing Annually — Directly & Indirectly



# NVIDIA Generative AI

Is Opening the Next Era of Drug Discovery and Design

- **AN INFLECTION POINT**  
Represent world of drugs in a computer
- **NEXT GENERATION OF CADD EMERGES**  
Platforms and techbios powerd by NVIDIA BioNeMo
- **OUR INVESTMENTS ARE PAYING OFF**  
Generative AI and NVIDIA Clara

