# 英科智能
# Insilico Medicine

insilico.com

Next-generation Artificial Intelligence for Health and Longevity

FROST & SULLIVAN

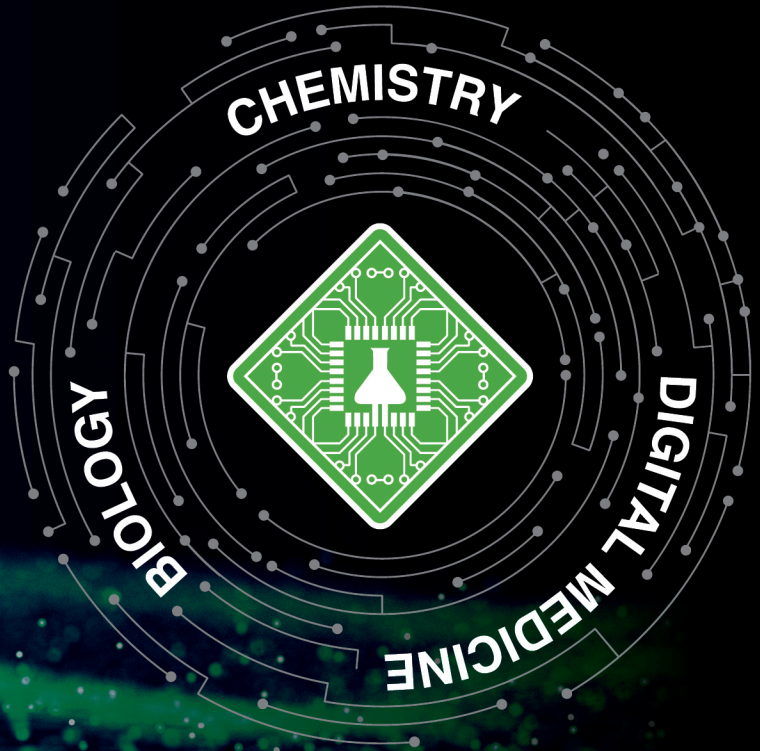
2018 North American Artificial Intelligence for Aging Research and Drug Development Award

INSILICO MEDICINE
ai.100
CB INSIGHTS
2018

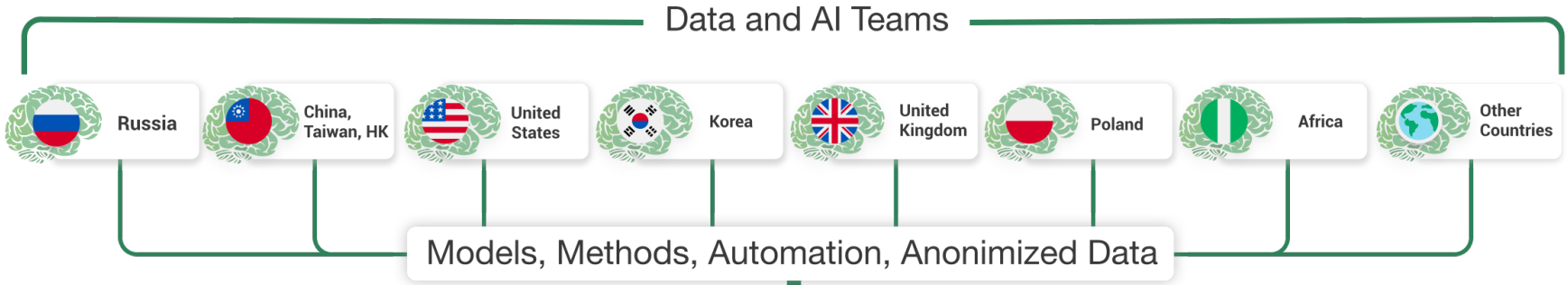
# Insilico AI Engine is a Unique Blend of Scientific Disciplines

- In the pharmaceutical companies human domain experts in biology, chemistry and digital medicine are disconnected.

- While most other AI startups focus on specific verticals and applications in a disconnected manner, Insilico AI engine aims to bridge biology, chemistry and digital modules into one seamless learning pipeline enabling our AI scientists to take on previously impossible chemistry and biology tasks.



# Global sourcing of talent, data and innovation




- Leader in Artificial Intelligence for Drug Discovery, Biomarker Development and Aging Research
- Attracted over $12 million in venture funding
- Over 200 research collaborators worldwide
- Deals with big pharma companies


- Nutraceuticals sold on the market with human data tracking system
- Top SAB including a Nobel laureate
- **Executed Projects:** Young.AI, Embryonic.AI, Nutriomi.com, Pandomics.com, Pharmacognitive.com, Geroprotector.com

# Market Opportunity — Pharmaceuticals

The current drug development process is expensive and inefficient. Most of the failures are due to the wrong disease-target association. **Using AI, we can bring effective drugs to market faster.**

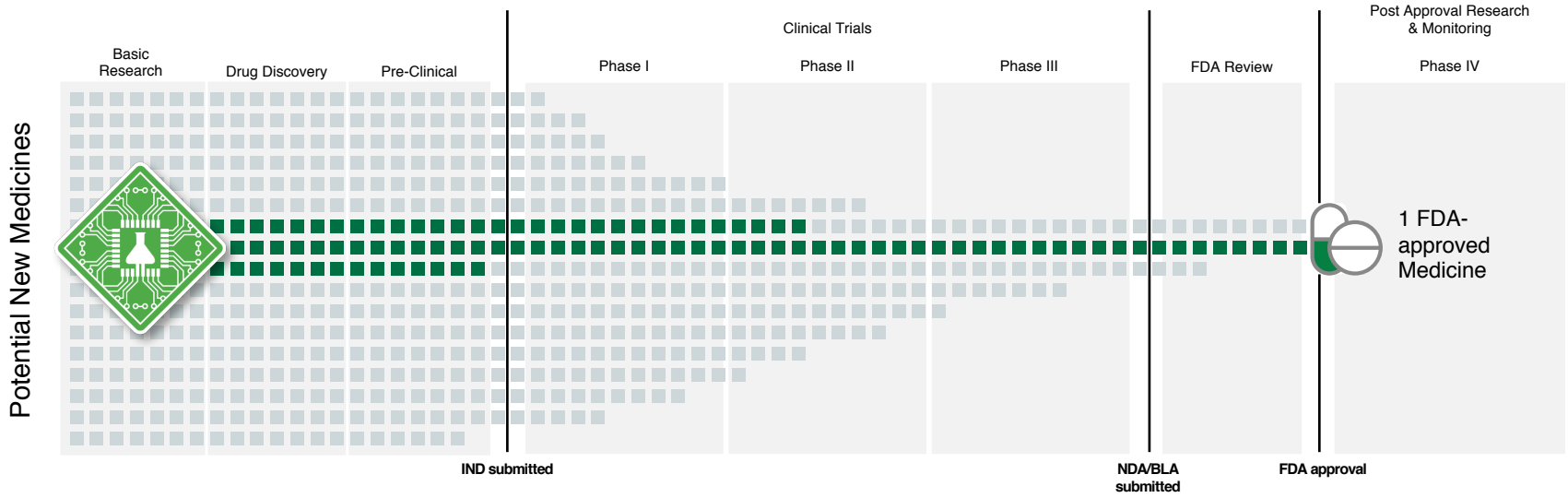
**> $2.63B**

to develop one drug

**92%**

failure rate after years of development

# Current State of Drug Discovery and the Potential of AI

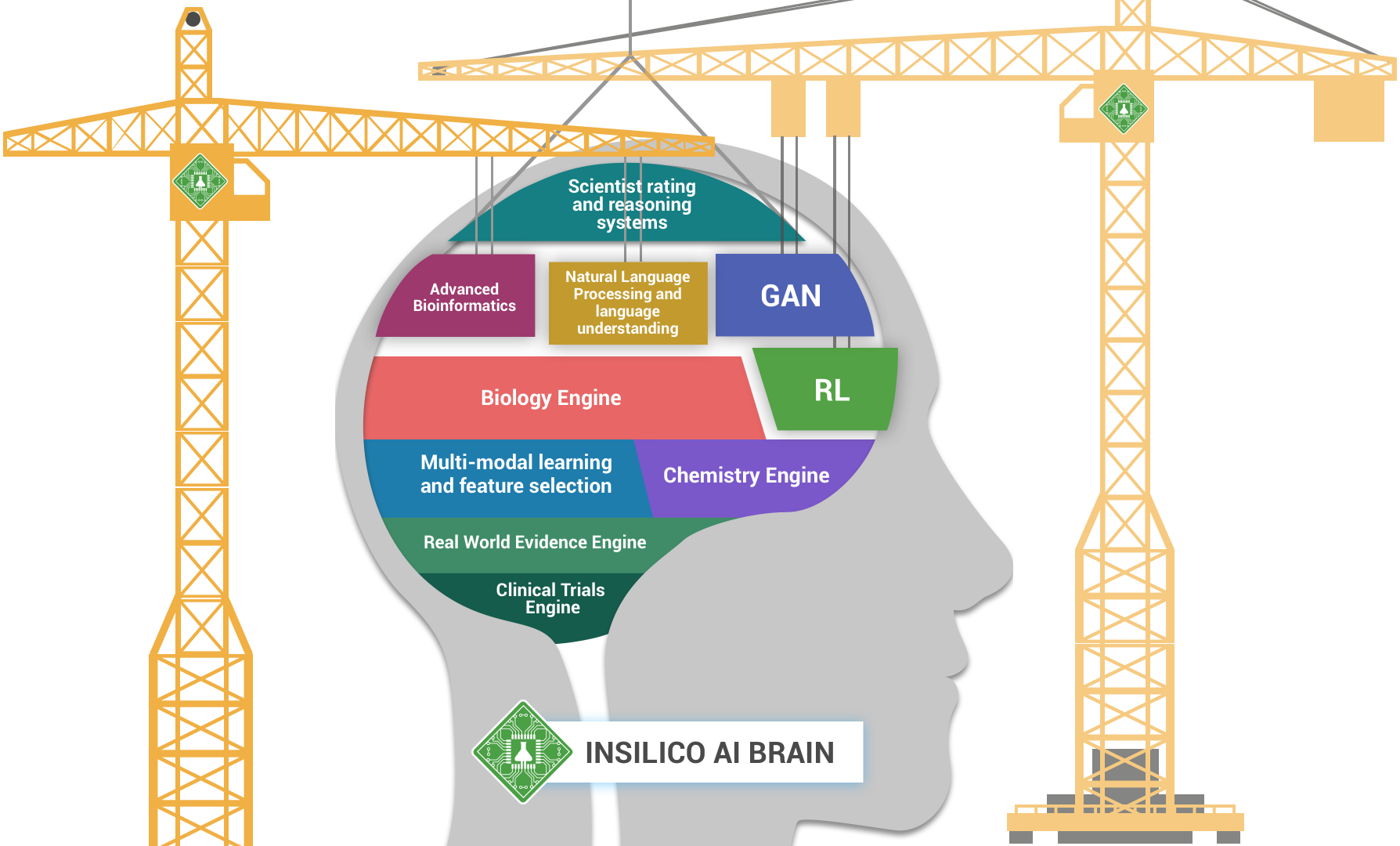



The potential to reduce failures and deliver cures is at the **preclinical** stage.

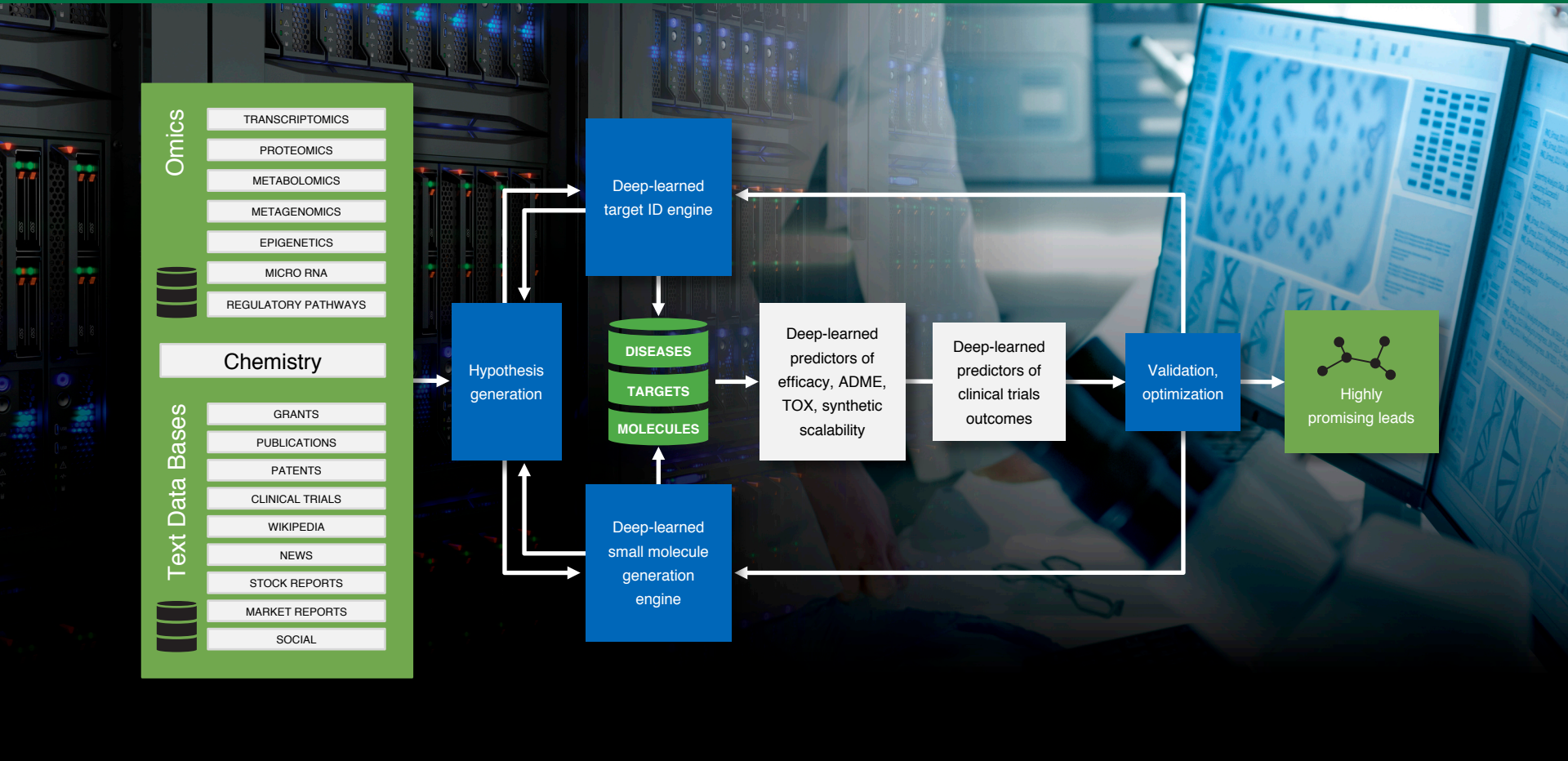
AI cannot shorten the clinical trials cycle but it can **deliver real cures to the right patients and reduce the failure rate**.

Once several drugs designed by AI reach the market the regulators are likely to **shorten the clinical trials time**.

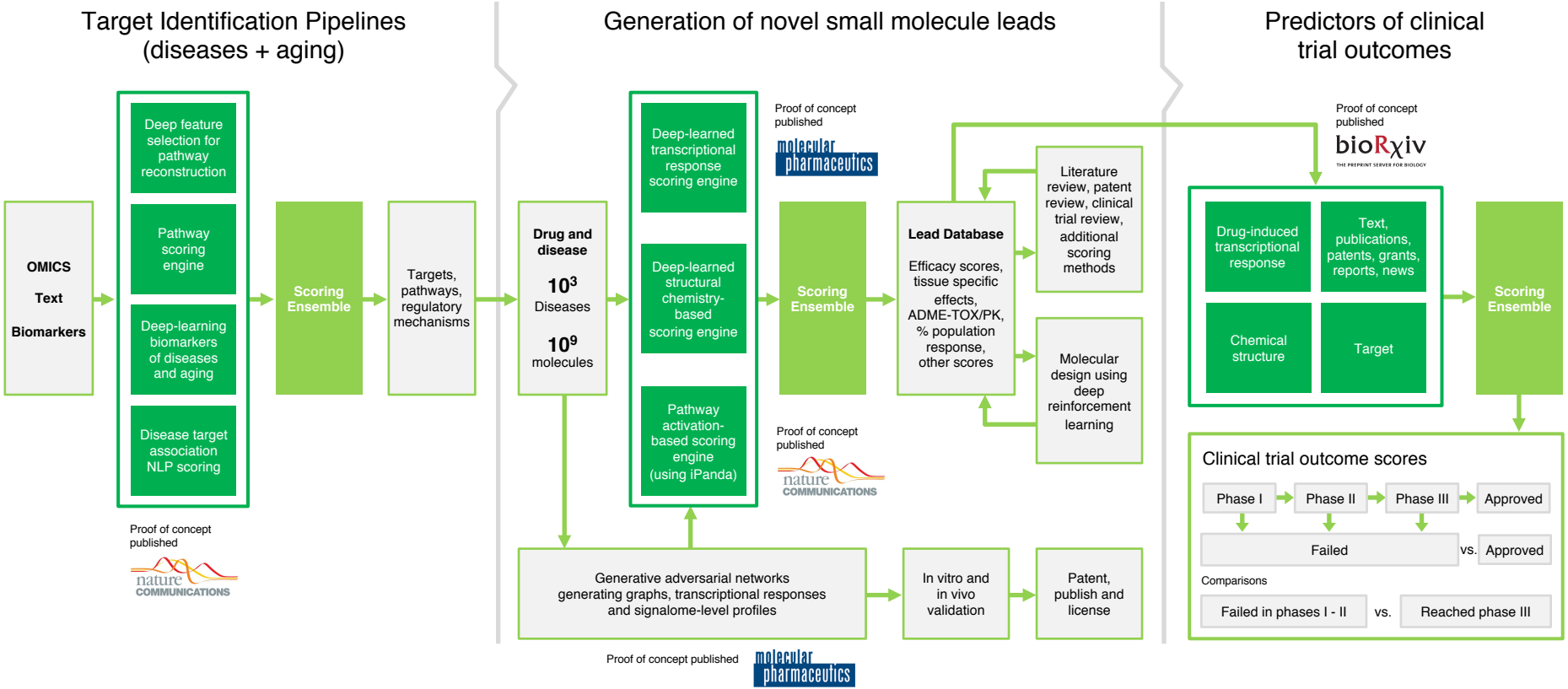
**The goal of AI is to shorten the research, discovery and preclinical stage from 3-4 years to a matter of months.** This will save valuable time and financial resources in the development stage while providing stronger drug candidates for approval.


Scientist rating and reasoning systems
Advanced Bioinformatics
Natural Language Processing and language understanding
GAN
Biology Engine
RL
Multi-modal learning and feature selection
Chemistry Engine
Real World Evidence Engine
Clinical Trials Engine
INSILICO AI BRAIN

# The Industry's Most Advanced End-to-End Drug Discovery AI

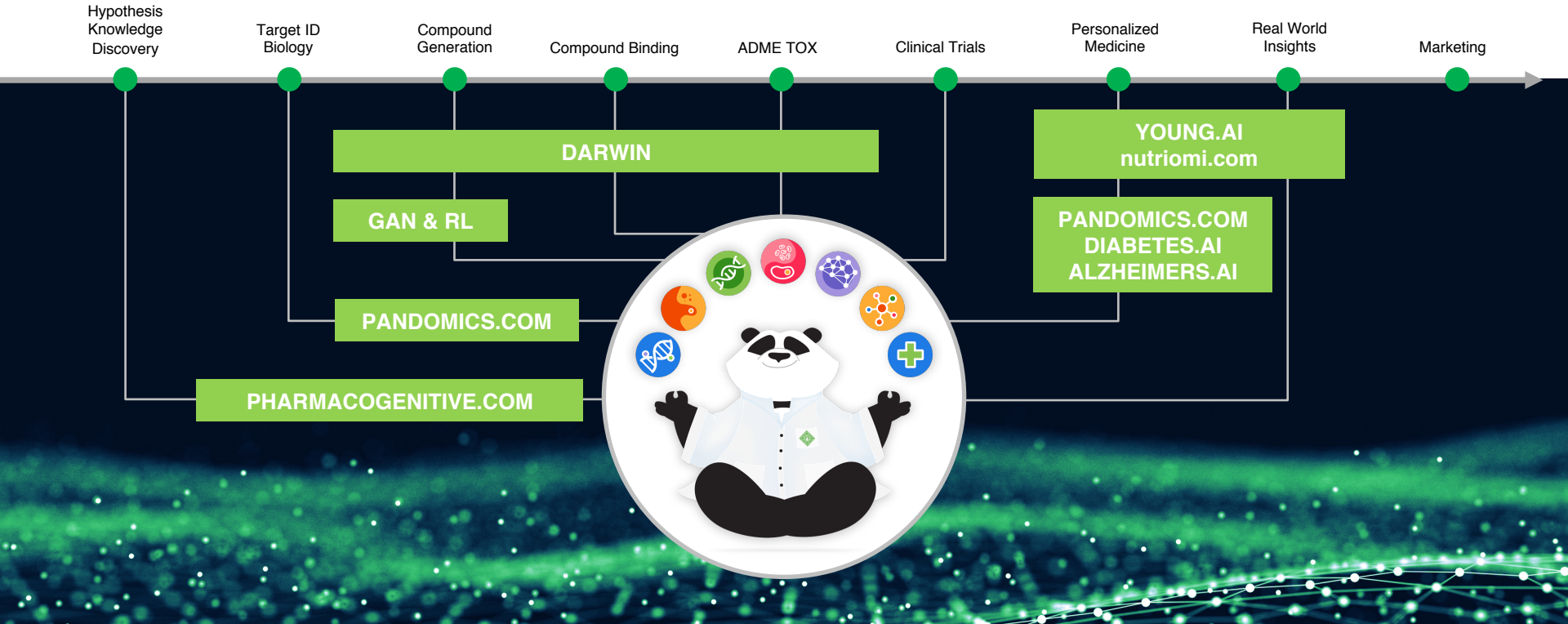


# The Industry's Most Advanced End-to-End Drug Discovery AI



# Panda.AI Integrated Deep Learning Framework and Library

## Applicable to every step of pharmaceutical drug discovery and development



# Proof of Concept Publications: PUBMED: “Insilico + Medicine”

| Type | Title |
|---|---|
| **GAN-RL for Med. Chemistry** | Entangled Conditional Adversarial Autoencoder for de Novo Drug Discovery. *ACS Mol. Pharm, 2018* |
| **GAN-RL for Med. Chemistry** | Reinforced Adversarial Neural Computer for De Novo Molecular Design. *ACS Chem. Informatics, 2018* |
| **GAN-RL for Med. Chemistry** | Adversarial Threshold Neural Computer for Molecular De Novo Design. *ACS Mol. Pharm, 2018* |
| **DNNs for Target ID** | Machine Learning on Human Muscle Transcriptomic Data for Biomarker Discovery and Tissue-Specific Drug Target Identification, *F. Gen. 2018* |
| **3D Representation of Molecules** | 3D Molecular Representations Based on the Wave Transform for Convolutional Neural Networks. *ACS Mol. Pharm, 2018* |
| **DNNs for Age Prediction** | Population specific biomarkers of human aging: a big data study using South Korean, Canadian and Eastern European patient populations. *Journal of Gerontology Section A, 2018* |
| **GANs for Med. Chemistry** | druGAN: An Advanced Generative Adversarial Autoencoder Model for de Novo Generation of New Molecules with Desired Molecular. *Properties In Silico. ACS Mol. Pharm., 2017* |
| **DNNs for Side Effects** | Towards natural mimetics of metformin and rapamycin. *Aging, 2017* |
| **DNNs for Target ID** | Use of deep neural network ensembles to identify embryonic-fetal transition markers: repression of COX7A in embryonic and cancer cells. *Oncotarget, 2017* |
| **GANs for Medicinal Chemistry** | The cornucopia of meaningful leads: Applying deep adversarial autoencoders for new molecule development in oncology. *Oncotarget, 2016* |
| **Dimensionality Reduction Algorithm** | In silico Pathway Activation Network Decomposition Analysis (iPANDA) as a method for biomarker development. *Nature Communications, 2016* |
| **DNNs for Classification of Molecules** | Deep Learning Applications for Predicting Pharmacological Properties of Drugs and Drug Repurposing Using Transcriptomic Data. *ACS Molecular Pharmaceutics, 2016* |
| **DNNs for Age Prediction** | Deep biomarkers of human aging: Application of deep neural networks to biomarker development. *Aging, 2016* |
| **DL Review** | Applications of Deep Learning in Biomedicine. *ACS Molecular Pharmaceutics, 2016* |

## Contact

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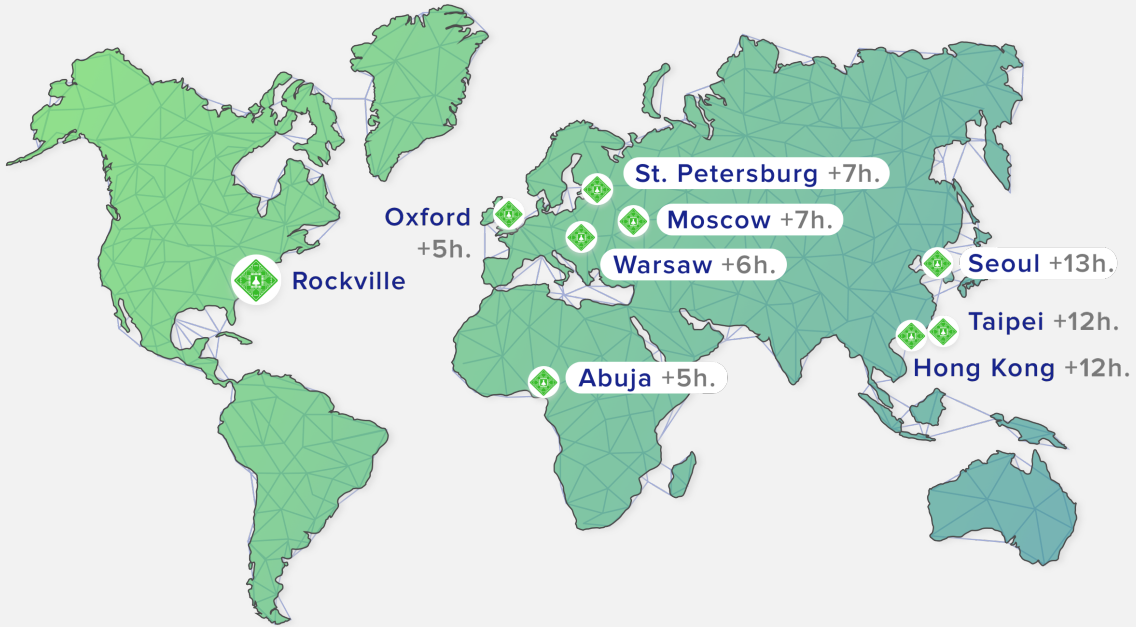


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