



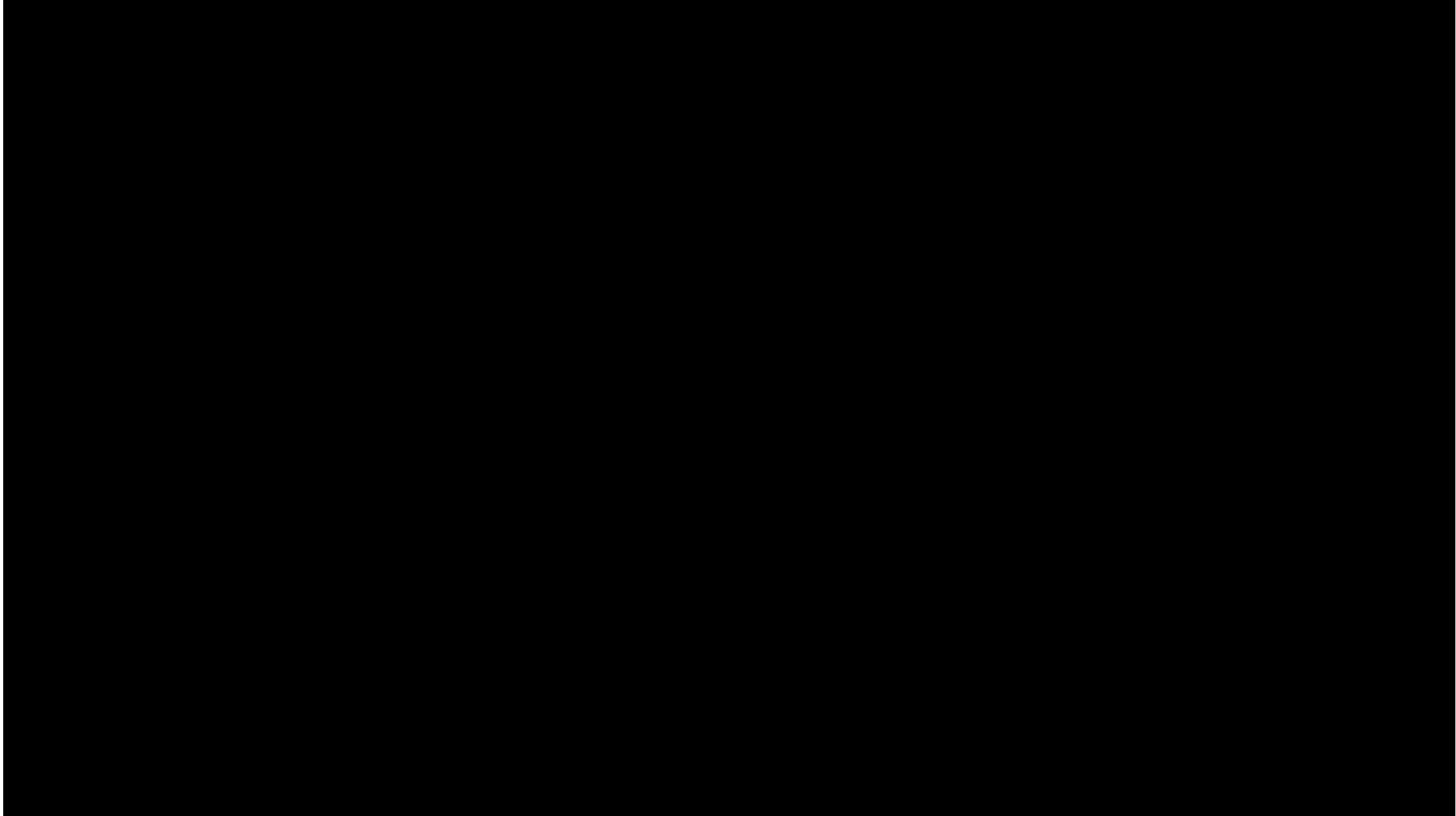
What science can do

Cindy Hoots, Chief Digital Officer & CIO, AstraZeneca

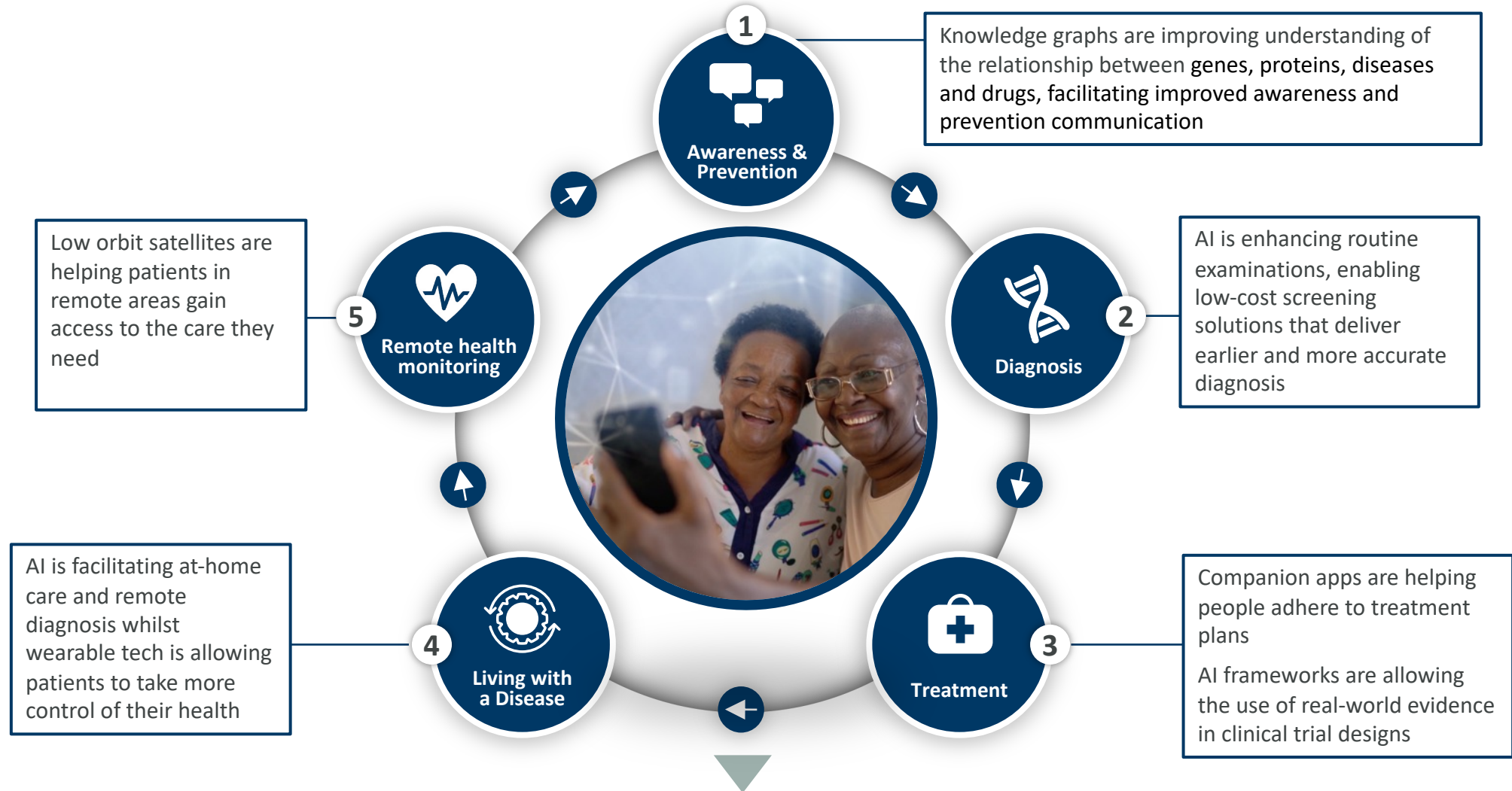
“There are very few times in our careers when we are able to be part of a massive change in our industry while having a positive impact on society...with the advancements in technology, the opportunities right now are endless.”

Cindy Hoots





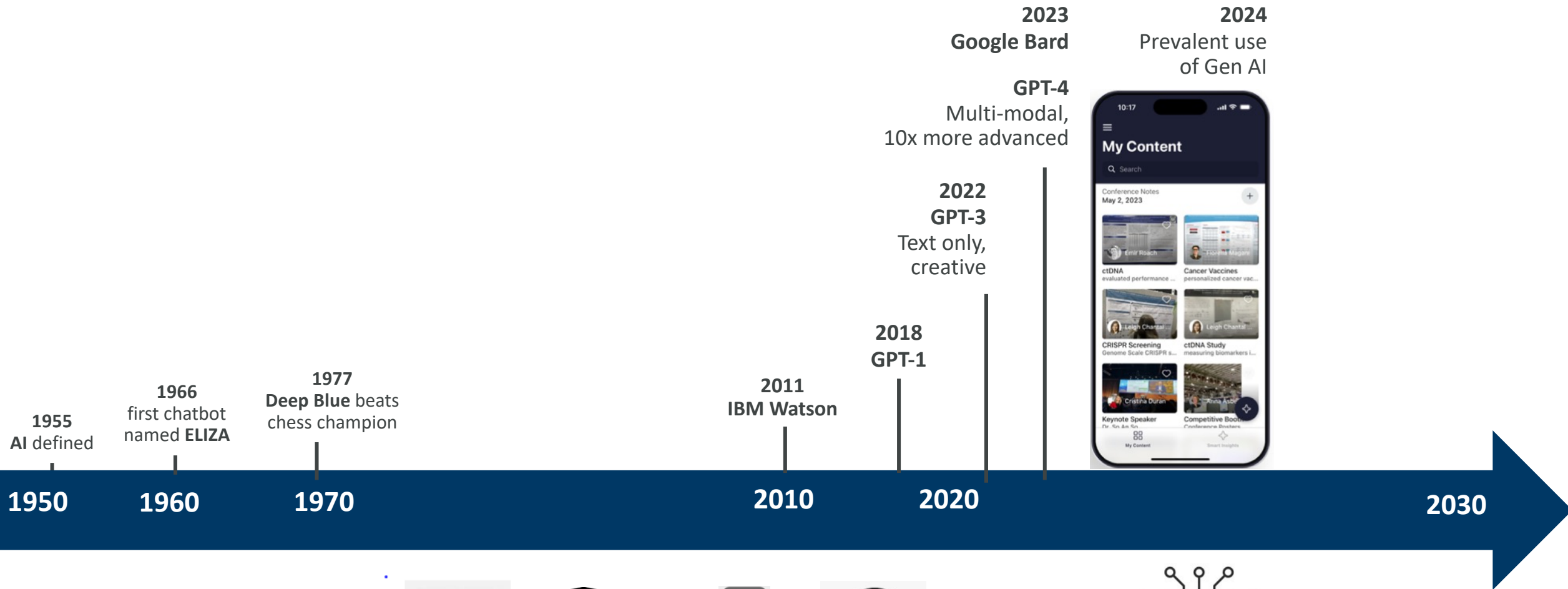
The patient experience is being revolutionized by AI



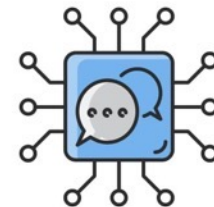
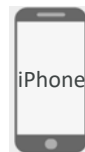
We are working towards a future where all people have access to sustainable and affordable healthcare.



The acceleration & convergence of AI has opened up new avenues for innovation & will revolutionize our industry



Technology trends

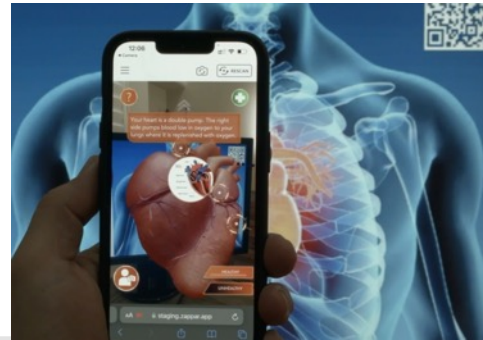


Technology is stretching the limits of what we thought possible

Emerging
technology



Generative AI



Immersive Experiences



Connected Everything



Digital Twins

Foundations



Scalable
Platforms



Language
Translation



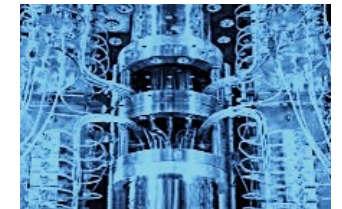
AI - ML/DL
NLP/ML Ops



Data
Foundations



Cyber &
Zero Trust



Quantum
Computing (PoC)



Artificial Intelligence at AstraZeneca

400+

data scientists employed

100+

active AI projects within
R&D alone



Drug discovery and development

- Advanced drug discovery
- Patent optimization
- Gen AI Research Assistant



Regulatory submission and monitoring

- Clinical forecasting and automation
- Pharmacovigilance



Manufacturing and supply

- Smart Factories
- Autonomous manufacturing



Commercial launch and patient outcomes

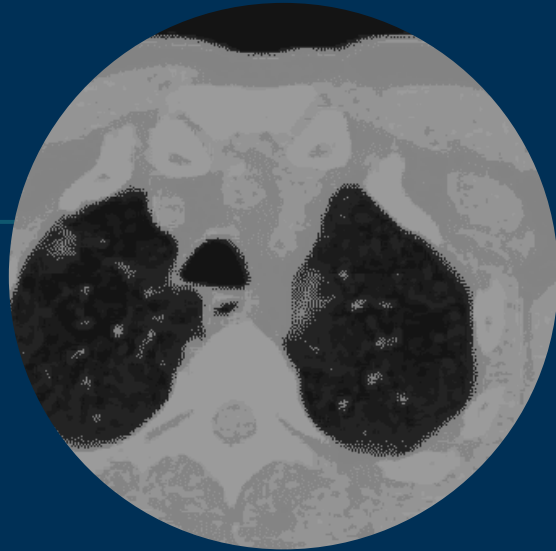
- HCP experience
- Patient assistance
- Patient journey



AI in clinical trials: *Computer Vision*

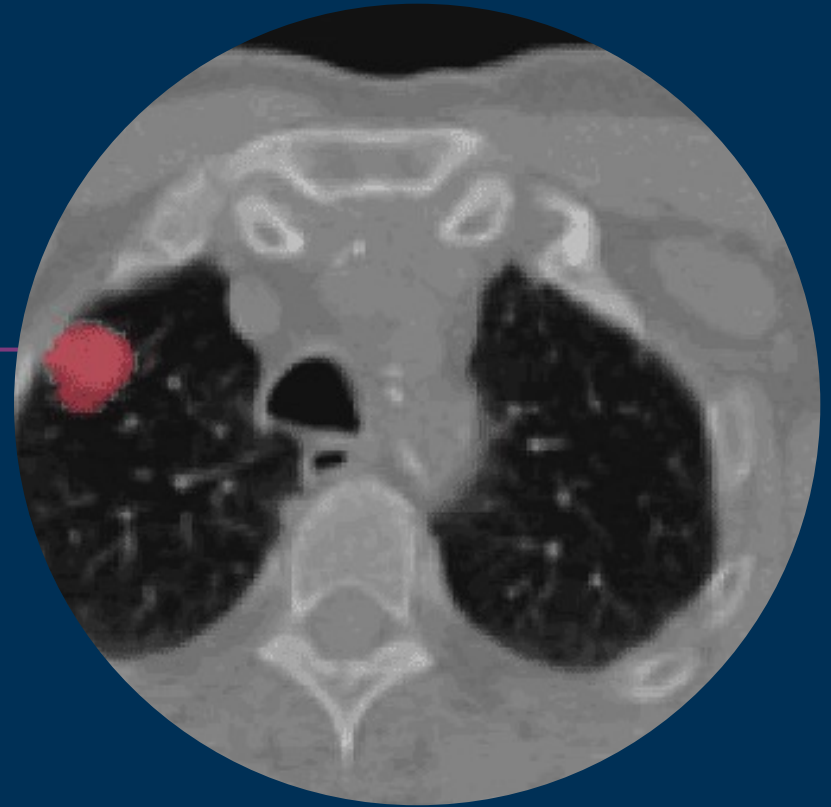
From

Manually
annotate
CT scans



To

Use of AI as
assistant to
annotate and track
exact 3D location,
monitor response
or relapse

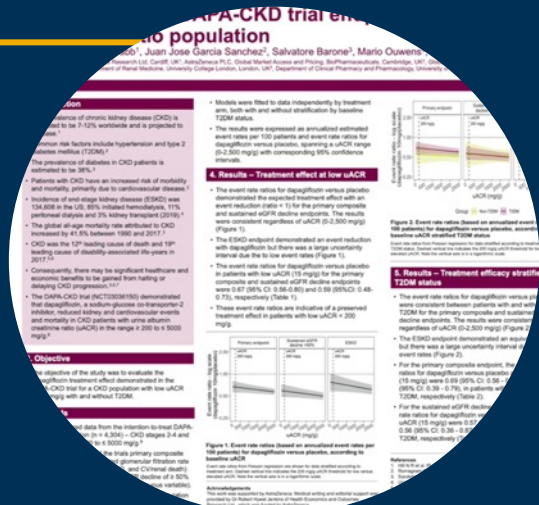


Generative AI is supporting our scientists in drug discovery

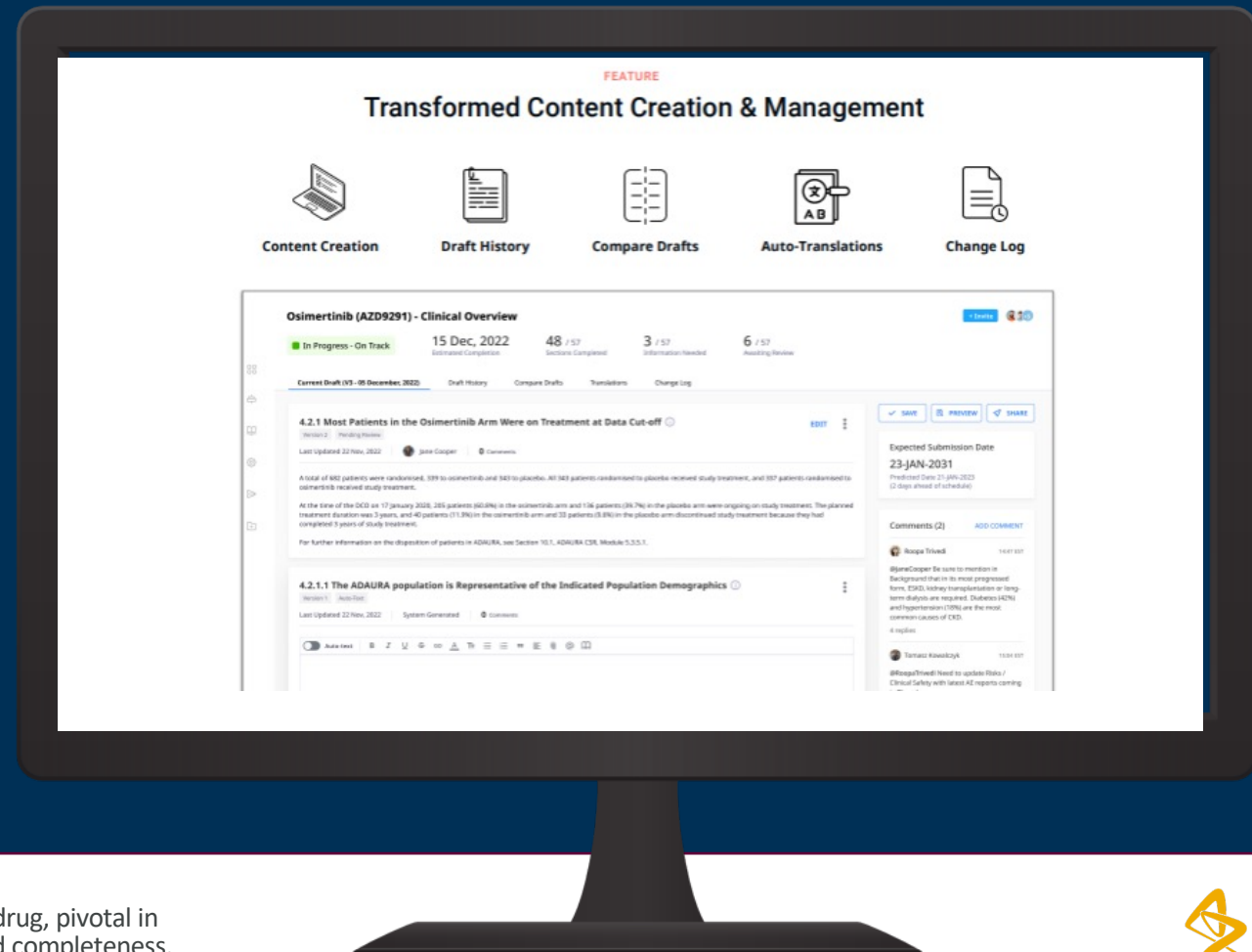


Generative AI is also expediting regulatory documentation

From
Weeks of iterative review between functions to create submissions documents for new drug filings



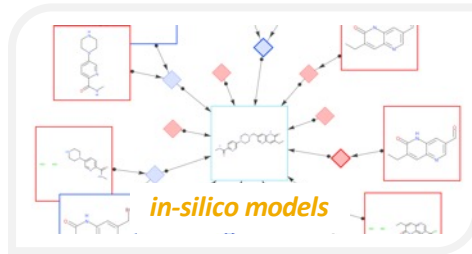
To
Minutes to generate draft document in required format



AI is now imbedded in our end-to-end supply chain

Drug development

digital synthetic route design



50% reduction in route design lead time with AI-enabled predictive tools

Solving for optimised routes with:

- > Fewest synthetic steps
- > Lowest potential COGS
- > Lowest carbon footprint

Manufacturing

advanced analytics and optimization



>20% increased yield with AI-enabled analytic tools



Identify new parameters



Target process adjustments



Define new process ranges

Supply chain

digital twins for raw material planning



90% reduction in dispensing planning time with AI-enabled digital twins

1

balance material, asset, resource availability

2

balance for various operations and products

while ensuring "just-in-time" process



AI is helping reduce misdiagnosis of rare diseases

Hypophosphatasia (HPP) is a rare, inherited, chronic, progressive metabolic disorder. Diagnosis takes 1 year in children and 10 years in adults.

By triangulating data from claims and electronic medical records we have developed AI models that characterize and predict potential people with HPP based on demographics, symptoms, interventions and prescription medicines.



Partnering with Qure.AI to improve early disease diagnosis

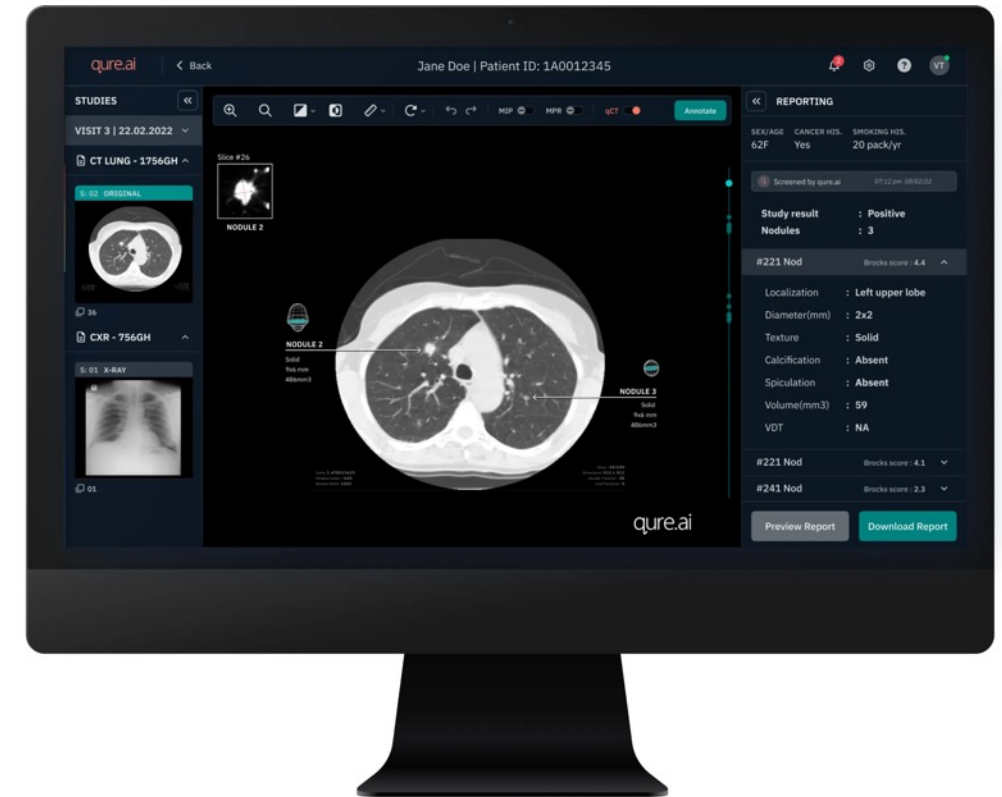
Leveraging AI to drive benefits for people, patients and the planet

- Supporting earlier diagnosis of lung cancer in low- and middle-income countries
- Combining routine chest x-rays and AI to detect pulmonary nodules for malignancy risk, providing a low-cost, accessible screening solution for early lung cancer risk-detection
- This technology is helping create efficient and leaner radiology departments, leading to cost savings and reduced burden for clinicians
- It is now being explored in heart failure and COPD

25+
countries

~1.75 M
scans to date

300+
sites



AI helps us bring healthcare to rural communities



Breast cancer screening and referral



AI-powered answers for breast cancer challenges

Breast AI provides real-time ultrasound scanning with predictive analysis of possible malignancy with 97.6 % accuracy

AI access at public clinic level drives scalability



Breast AI collaborated with Clarius to offer wireless, built in Wi-Fi, ultrasound probe technology.

Time to treatment is being reduced from >6 months to 1 week



Clear pathways mean only high-risk patients are referred, reducing the burden on healthcare facilities. Referring the right patient, at the right time to the right facility for intervention.



AstraZeneca's principles for ethical data and AI

Rapid developments in AI technology have brought us in to uncharted territory, and companies and regulators must work together to meet the new challenges posed. Our principles will empower us and our partners to navigate this new environment safely and effectively. By encouraging innovation and evolution while maintaining our values, they provide a long-term ethical foundation to uphold our AI governance.

During 2020, we engaged a diverse range of experts both inside and outside AstraZeneca to develop principles for ethical data and AI, aligned with our Code of ethics and values. These values work for patients and employees and enable AstraZeneca to make a positive contribution to society.



Pushing the boundaries of science through AI expertise

By combining human ingenuity and technology, we are revolutionizing our industry and transforming patient outcomes

By uniting AI and machine learning with the combined expertise of our Chemists, we are working to uncover insights into designing and synthesising drugs for increasingly complex disease targets with advanced technology and AI models that can be deployed at scale.

de novo design application, which generates new ideas for drug candidates.

ADD Platform
ADD provides a suite of capabilities to facilitate drug design and make decisions which will accelerate our ability to develop drug candidates.

Interfacing
Chemists and AI now work seamlessly together to augment the 'Design' and 'Make' phases for novel compound discovery.

PIP
(Predictive Insight Platform)
AI models deployed at scale and used by hundreds of scientists to run more than 100 AI/ML models, processing ~1.5 million compounds per day to make predictions of drug properties.

Research (Target ID, Lead ID) → **Development** (CD ID, Pre-IND ID, IND ID, PDUFA ID, COMM ID)





Q&A

