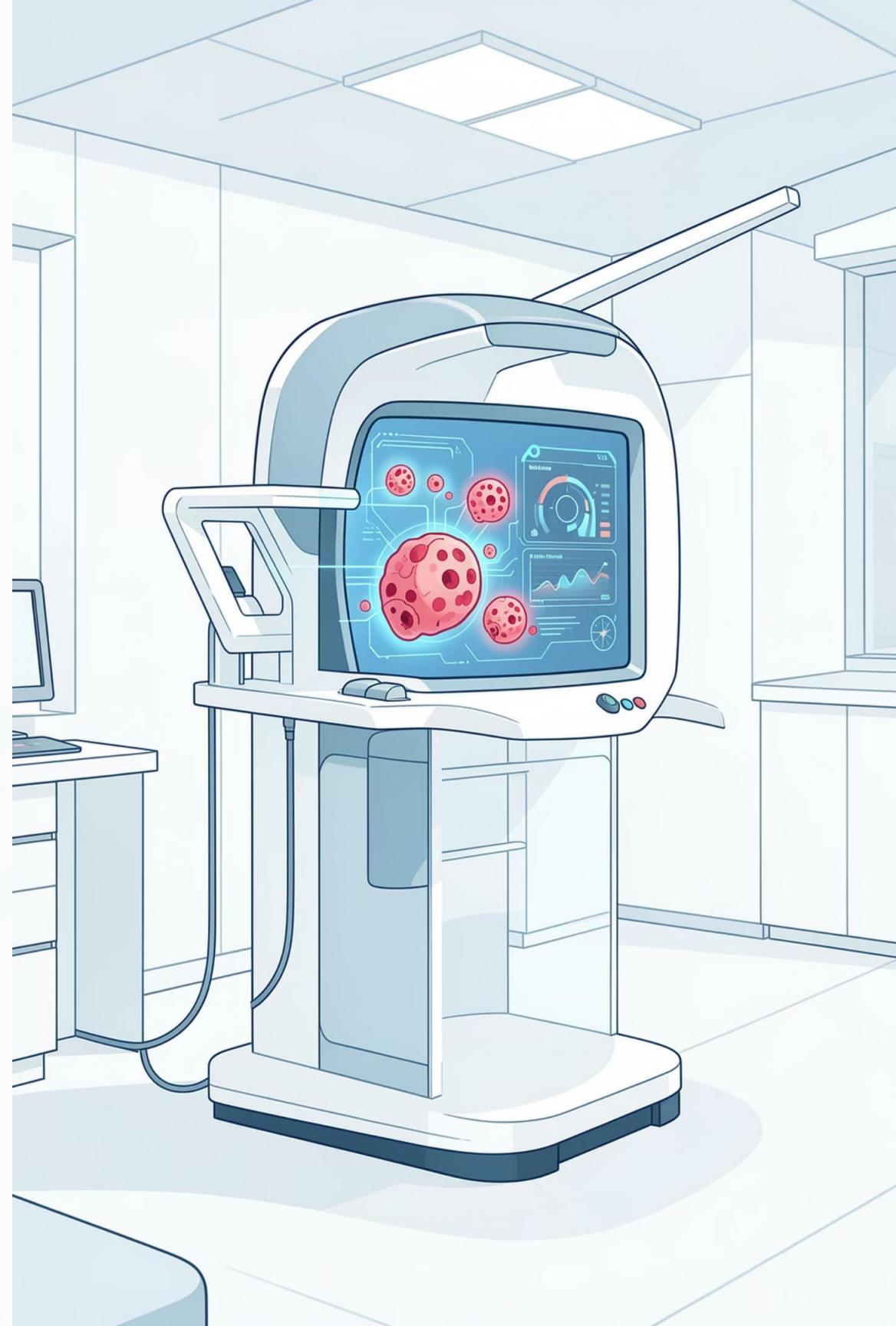


Cancer Detection Using AI: Revolutionising Early Diagnosis



The Urgency of Early Cancer Detection

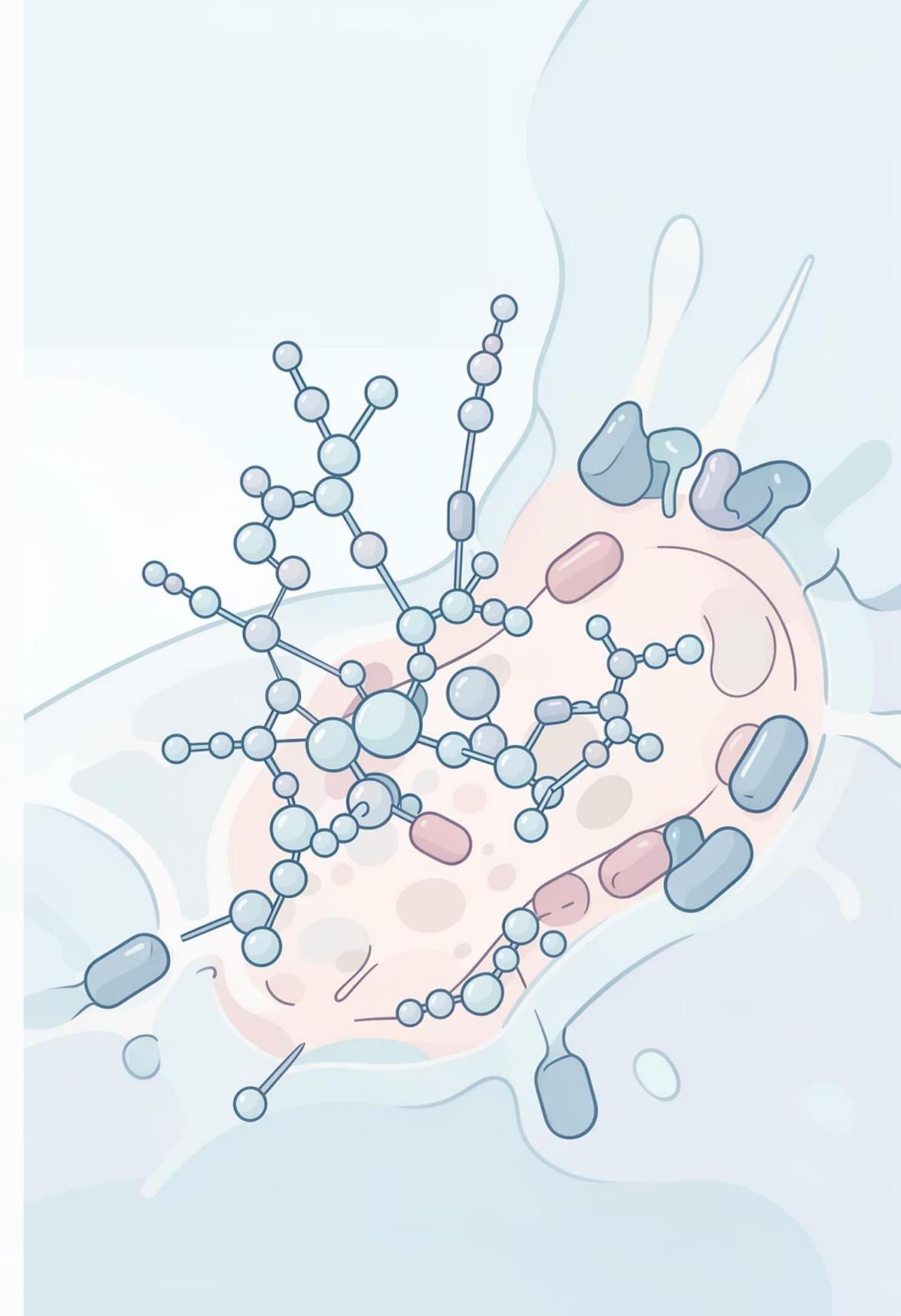
Early detection is paramount in the fight against cancer, significantly enhancing survival rates and improving treatment outcomes.

- Early-stage cancer detection dramatically improves survival rates.
- Traditional diagnostic methods often identify cancer at later stages, limiting optimal treatment efficacy.
- Artificial Intelligence (AI) offers a groundbreaking approach to detect cancer even before physical symptoms manifest, fundamentally altering the diagnostic landscape.

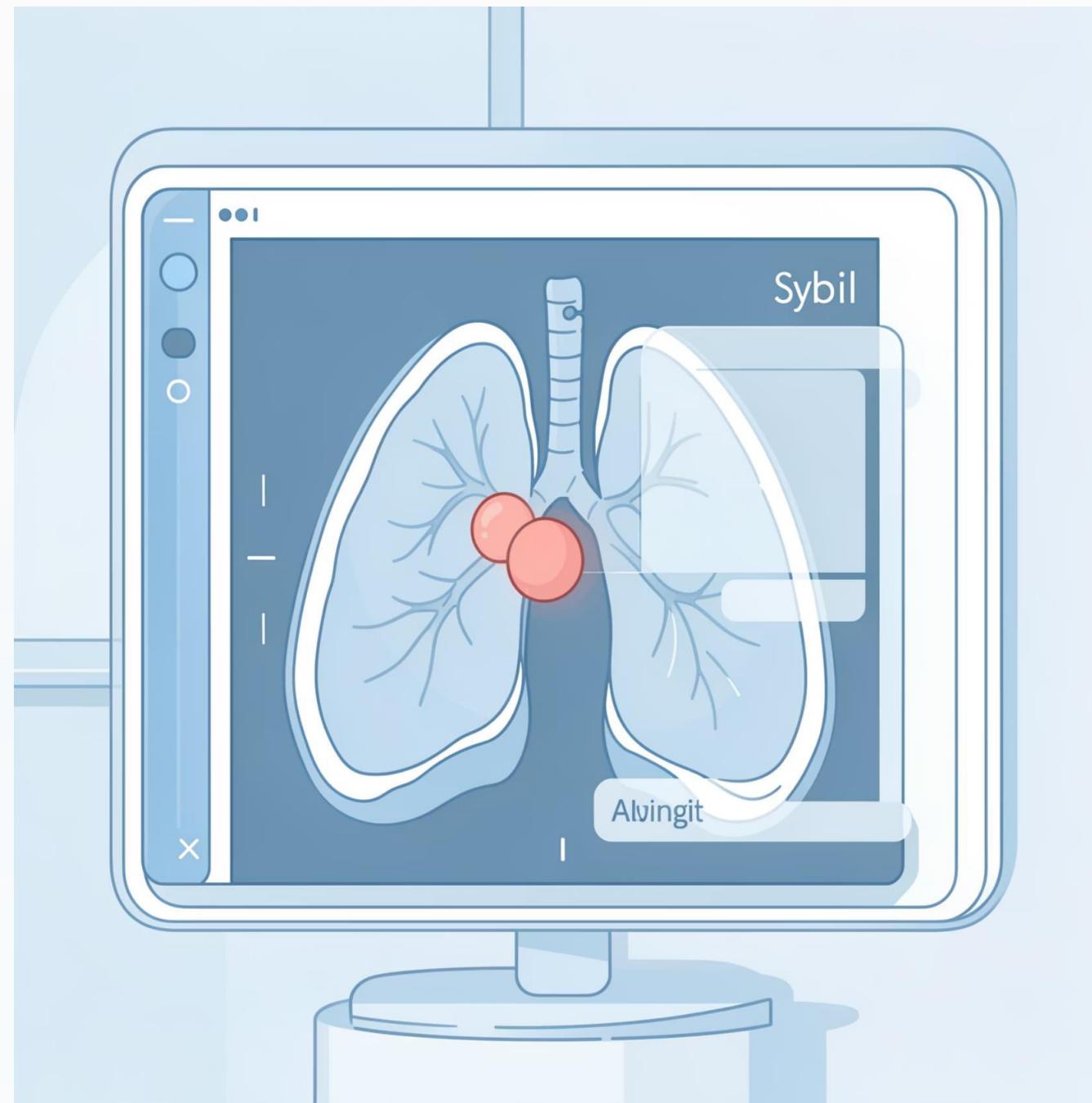


AI-Generated Molecular Sensors: A New Frontier

- 1**
AI-Designed Peptides
MIT researchers have pioneered nanoparticles coated with sophisticated AI-designed peptides.
- 2**
Early Detection
These advanced sensors are engineered to detect cancer-linked proteases at the earliest molecular stages within the body.
- 3**
At-Home Testing Potential
This technology holds immense promise for simple, accessible at-home tests, signalling cancer presence long before any clinical signs become apparent.



Sybil: AI Predicting Lung Cancer Before Visible Signs



- Developed by Mass General Brigham, Sybil analyses low-dose CT scans.
- Forecasts lung cancer risk with 80-95% accuracy, significantly outperforming traditional expert radiologist assessments.
- Uniquely, it requires only the CT scan image—no additional patient data is needed, streamlining the diagnostic process.
- Currently undergoing rigorous clinical trials across multiple US centres to validate its efficacy and safety.

MIRAI: Predicting Breast Cancer Years in Advance

MIRAI represents a significant leap forward in proactive breast cancer care.

Extensive Training

This AI model was meticulously trained on a vast dataset of 128,000 mammograms.

Future Risk Prediction

It can predict breast cancer risk up to 5 years into the future, offering a critical window for early intervention.

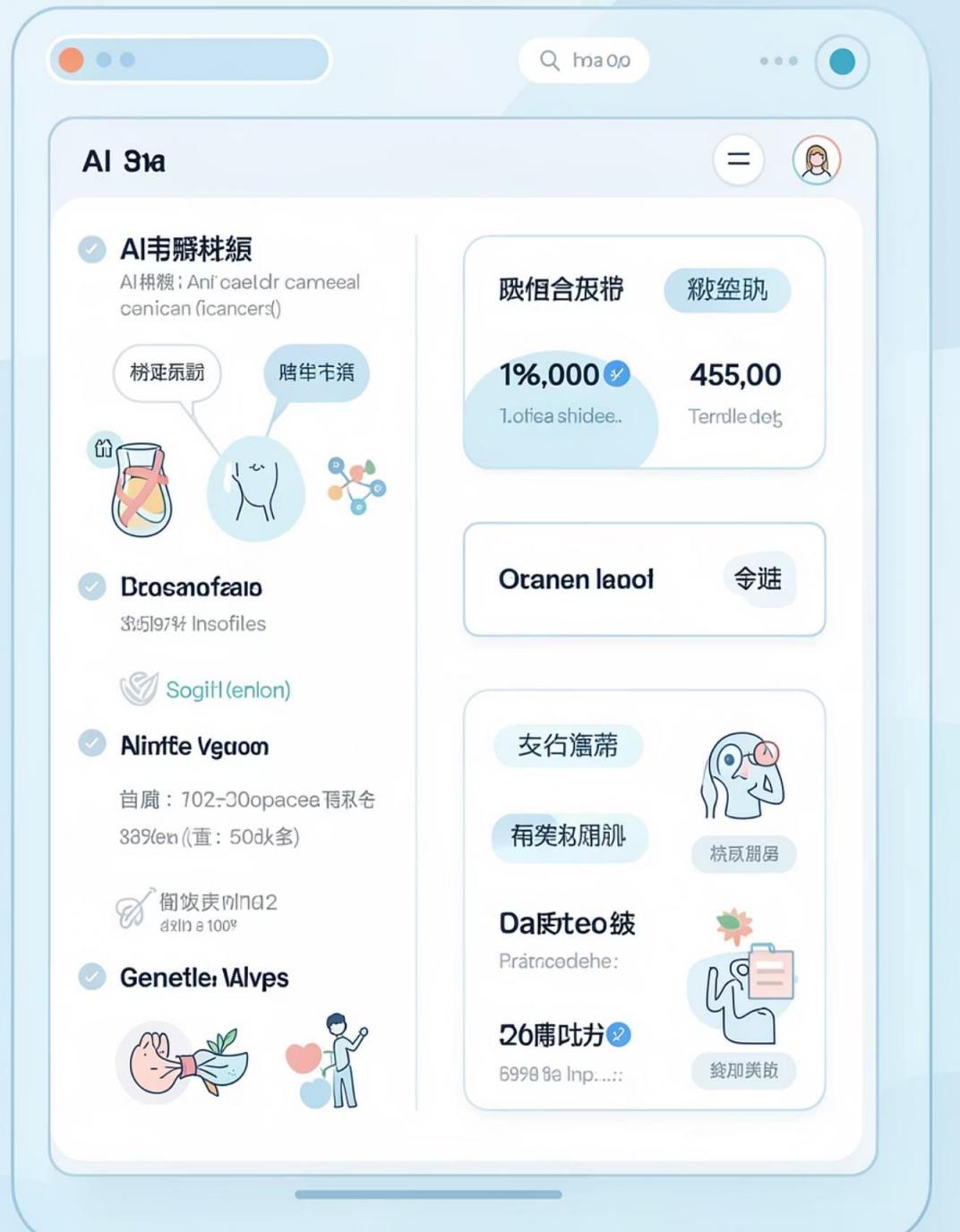
High Accuracy

MIRAI achieves 75-84% accuracy in forecasting future breast cancer diagnoses.

Leading Development

The model was developed by Dr Regina Barzilay and her dedicated team at Mass General Brigham.





Versatile AI Models Across Multiple Cancer Types

01

CHIEF Model

Harvard Medical School's CHIEF model diagnoses and predicts outcomes across an impressive 19 different cancer types.

02

Oncology's ChatGPT

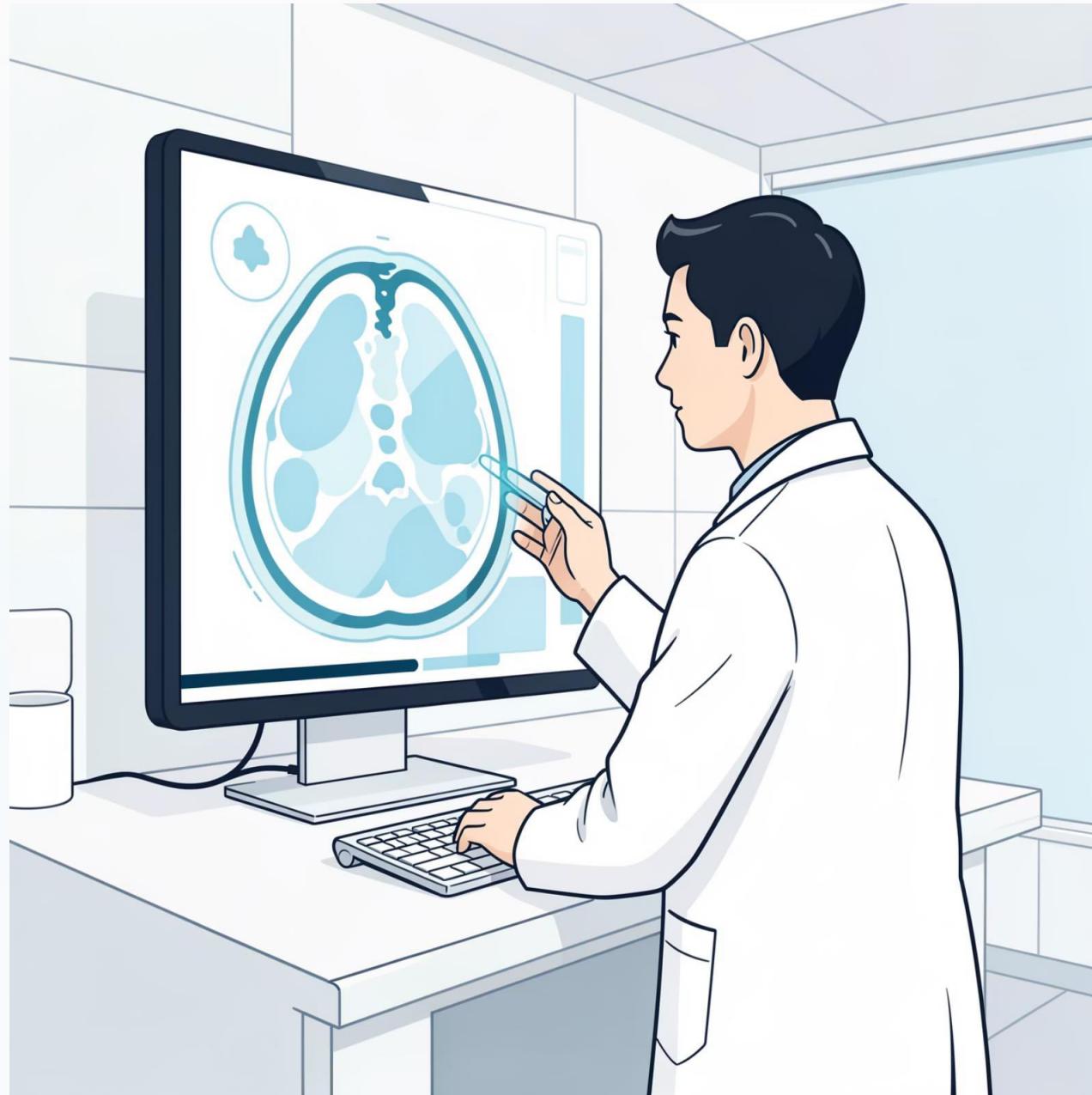
Functioning much like ChatGPT for oncology, it detects cancer, predicts molecular profiles, and guides treatment strategies.

03

International Validation

Its effectiveness has been validated internationally, demonstrating AI's broad potential beyond single cancer specialisations.

How AI Enhances Traditional Imaging and Diagnostics



- AI rapidly and accurately analyses complex imaging data from MRI, CT, and PET scans.
- It uncovers subtle patterns often imperceptible to the human eye, facilitating earlier medical intervention.
- This technology significantly reduces diagnostic errors and accelerates crucial treatment decisions, leading to better patient outcomes.

Overcoming Barriers to Screening and Access



Democratising Screening

Screening

AI-powered tools are poised to democratise cancer screening, extending reach to underserved populations worldwide.



Remote Solutions

They offer potential for low-cost, non-invasive, and remote testing solutions, making screening more accessible.



Addressing Disparities

AI directly addresses socioeconomic and geographic disparities, ensuring more equitable cancer diagnosis for all.

The Future: AI-Driven Personalised Oncology

1

Tailored Treatments

AI enables highly personalised treatments, precisely adapted to individual tumour profiles and genetic markers.

2

Integrated Approach

AI integrates early detection capabilities with detailed mutation mapping and innovative drug design strategies.

3

Accelerated Research

It significantly accelerates research and clinical trials, bringing new cures and therapies to patients faster.

Conclusion: AI is Transforming Cancer Detection and Care

- Early detection through AI is saving lives by identifying cancer at its most treatable stages.
- Breakthrough AI tools such as Sybil, MIRAI, and CHIEF are already demonstrating significant impact in clinical settings.
- Continued innovation and widespread clinical adoption will redefine cancer outcomes globally.
- Together, AI and medicine offer profound hope for a future with a dramatic reduction in cancer-related deaths.

