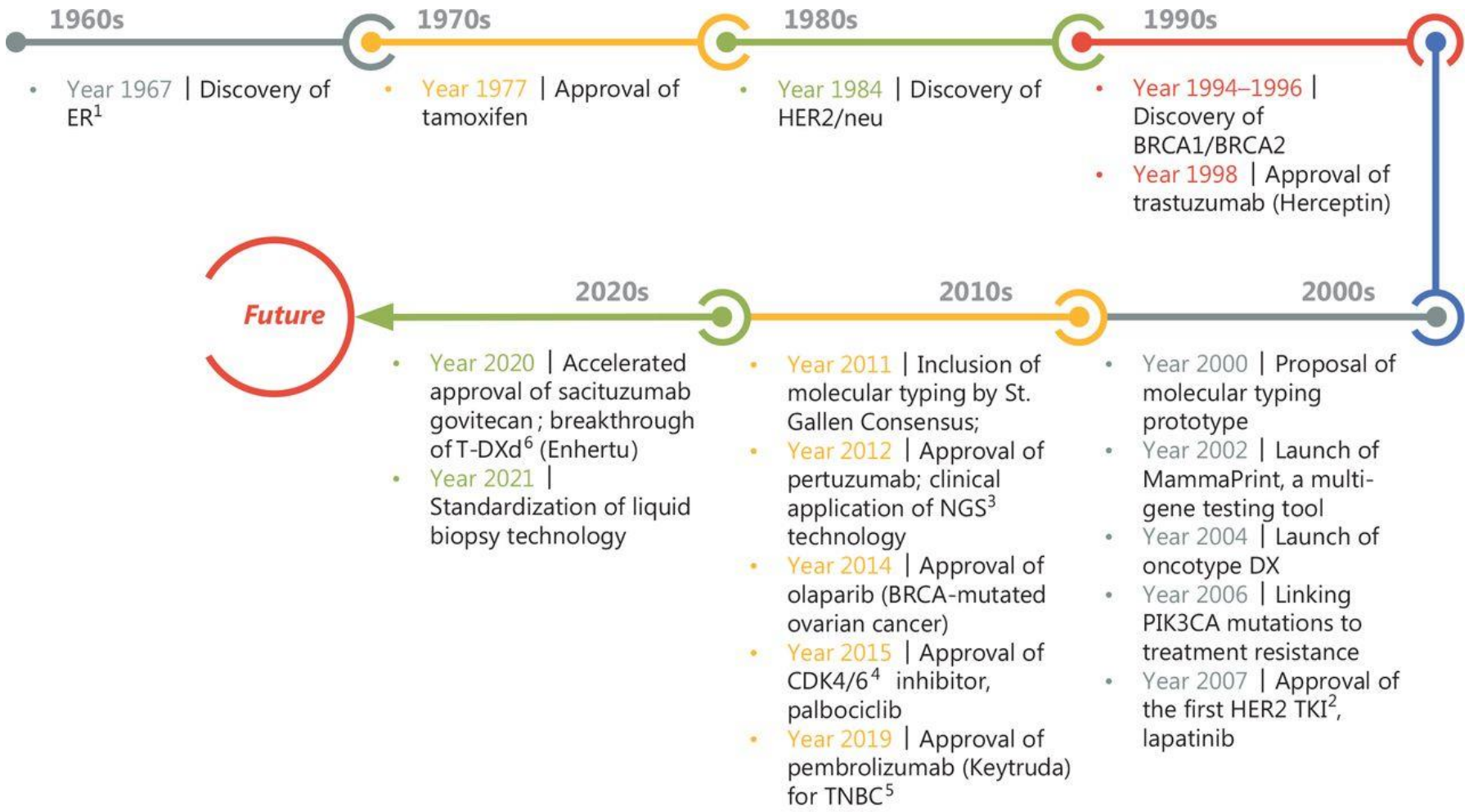
Advancements in Care Through Precision Oncology

Dr. Katherina Baranova, MD, FRCPC
Pathologist

He Cut off a very large Cancerated Breast from the Body of Elizabeth Hopkins of Oxford, in 1689, and perfectly Cured her: For that and many other considerable Cures, he hath a Testimonial from the Vice-Chancellor.





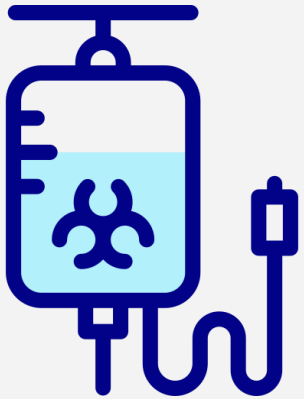
Bai J et al. The treatment of breast cancer in the era of precision medicine. Cancer Biol Med. 2025 Apr. PMID: 40269562.

Understanding Precision Oncology

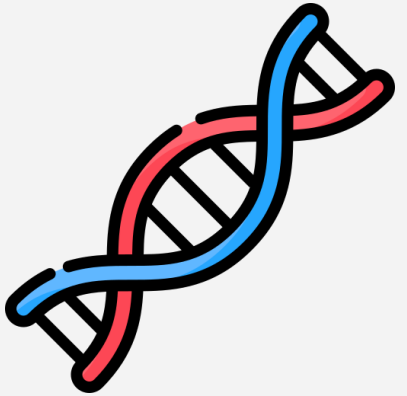
- What precision oncology is and why it matters
- The role of precision medicine in breast cancer care
- How precision oncology is helping personalize treatment

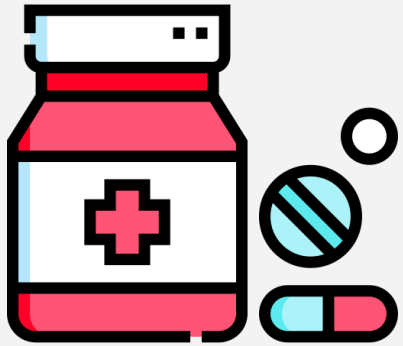


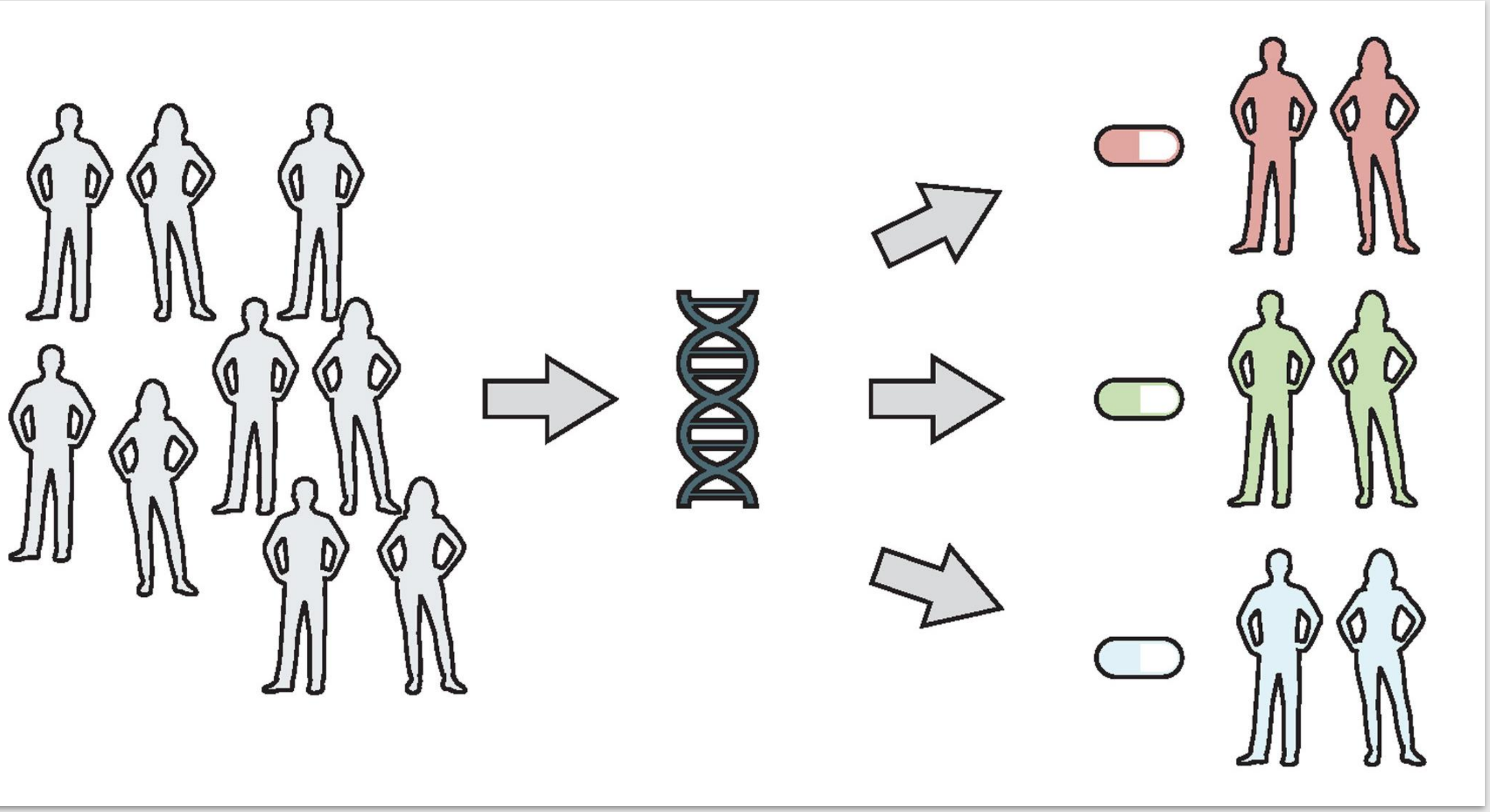


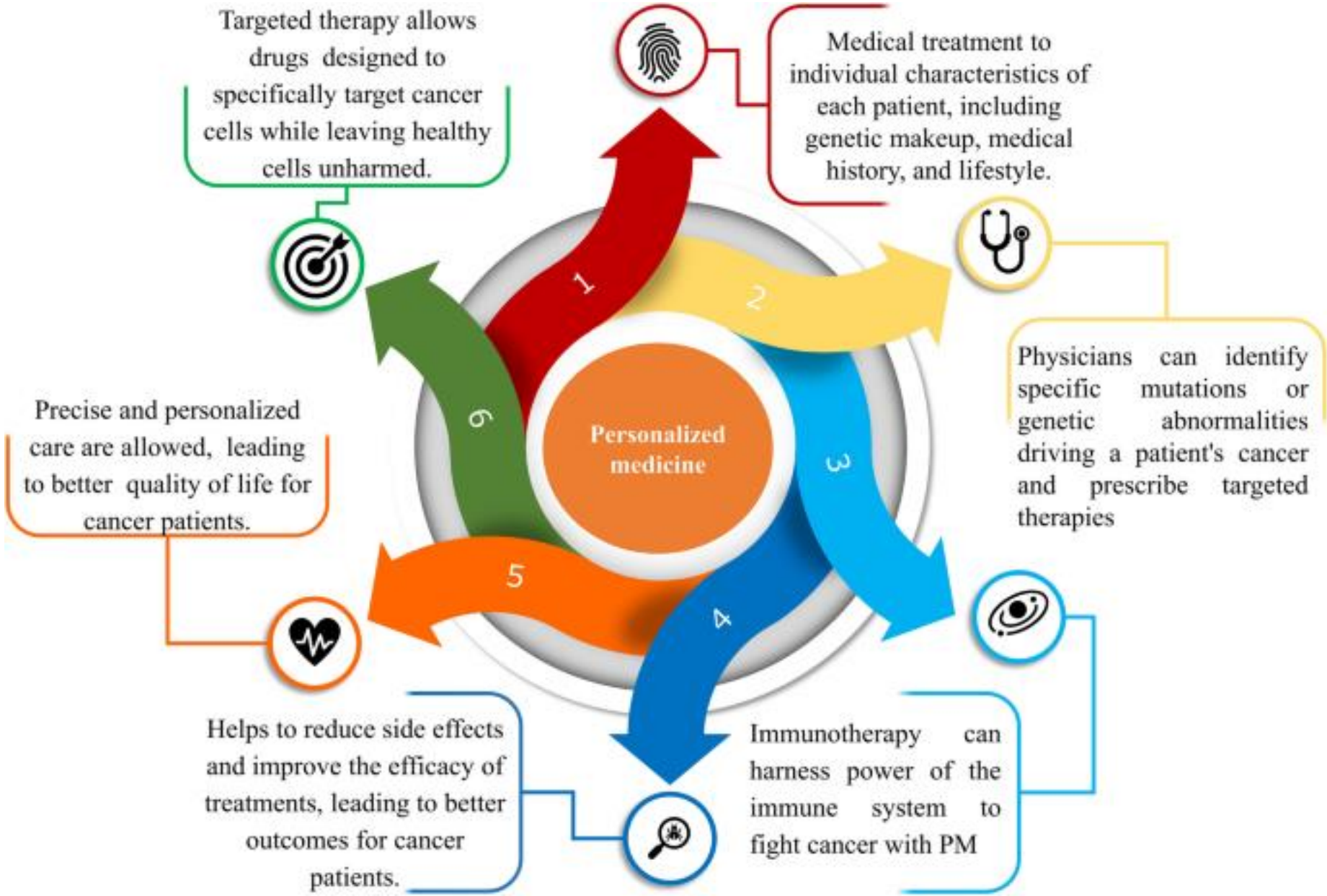






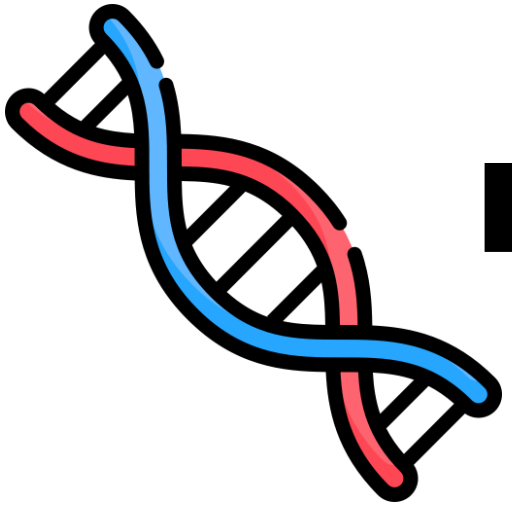




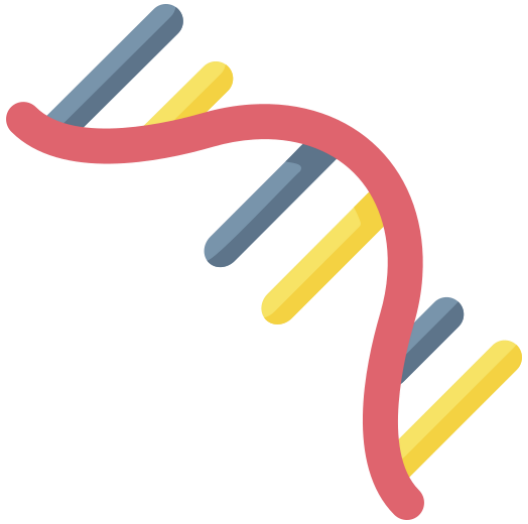


Gadade, *et al.* Unlocking the power of precision medicine: exploring the role of biomarkers in cancer management. *Futur J Pharm Sci* **10**, 5 (2024).

DNA



RNA

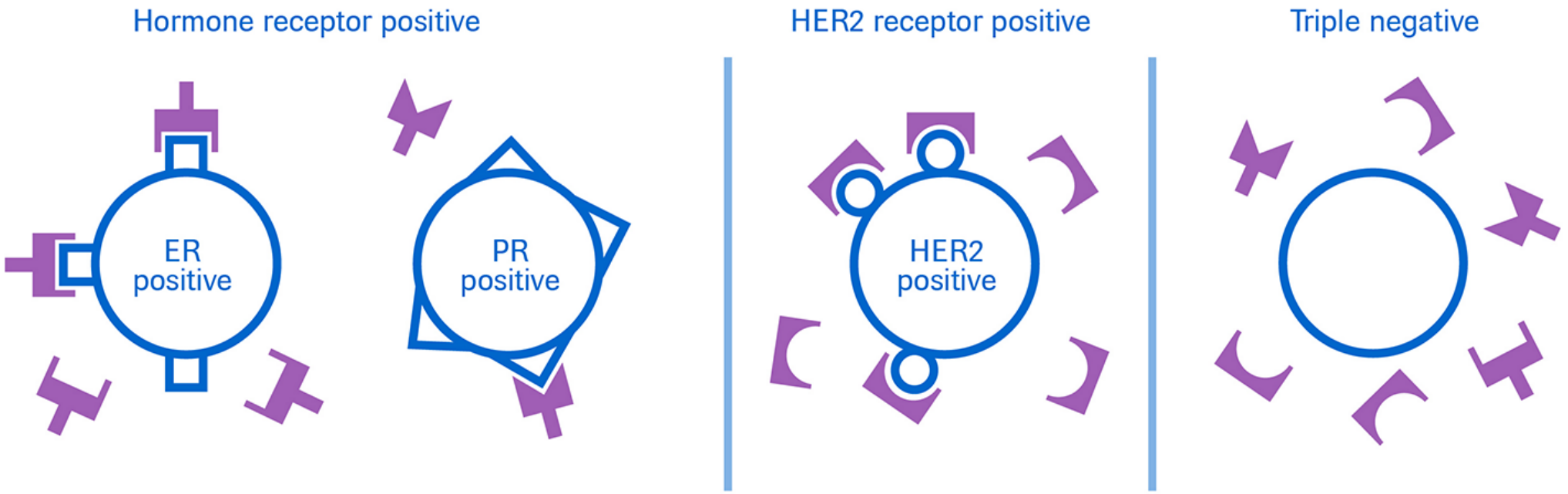


Protein



Advances in Precision Oncology

- Advances in genomic, molecular, and biomarker testing
- Emerging targeted therapies and personalized treatment approaches
- Recent clinical trial findings and emerging research
- How these advances are shaping breast cancer care



Sensitive to hormone deprivation

Sensitive to anti-HER2 therapies

Sensitive to chemotherapy and immunotherapy & more

PHASE 3 lidERA TRIAL RESULTS

Giredestrant vs Standard Endocrine Therapy in Early-Stage HR+/HER2– Breast Cancer

4,170 patients | **32.3 mo** median follow-up | **Stage I–III** ER+/HER2–

PRIMARY ENDPOINT: INVASIVE DISEASE-FREE SURVIVAL

30%

risk reduction

HR=0.70, p=0.0014

3-YEAR DISEASE-FREE SURVIVAL

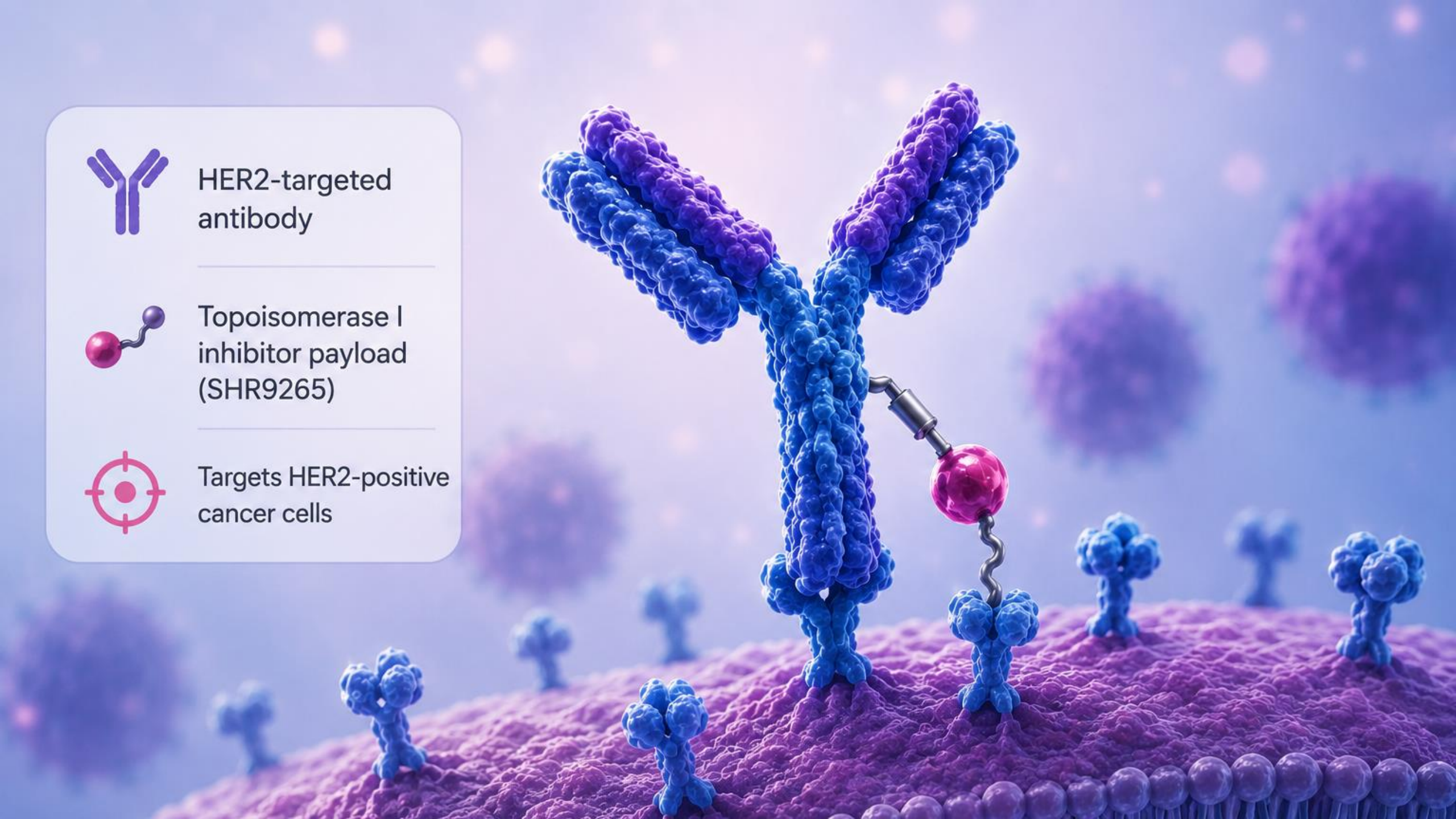


31%
reduction in distant metastasis
HR=0.69

5.3% vs 8.2%
discontinuation due to side effects

11.3% vs 3.2%
bradycardia (mostly grade 1)

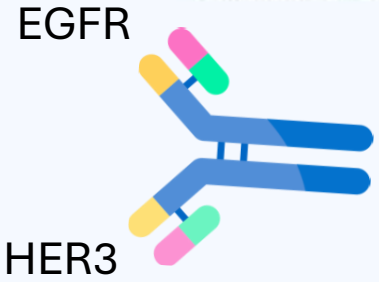
Source: SABCS 2025, Bardia et al. | Genentech/Roche


HER2-targeted antibody
Topoisomerase I inhibitor payload (SHR9265)
Targets HER2-positive cancer cells

ESMO 2026 Congress

OncoDaily Breast

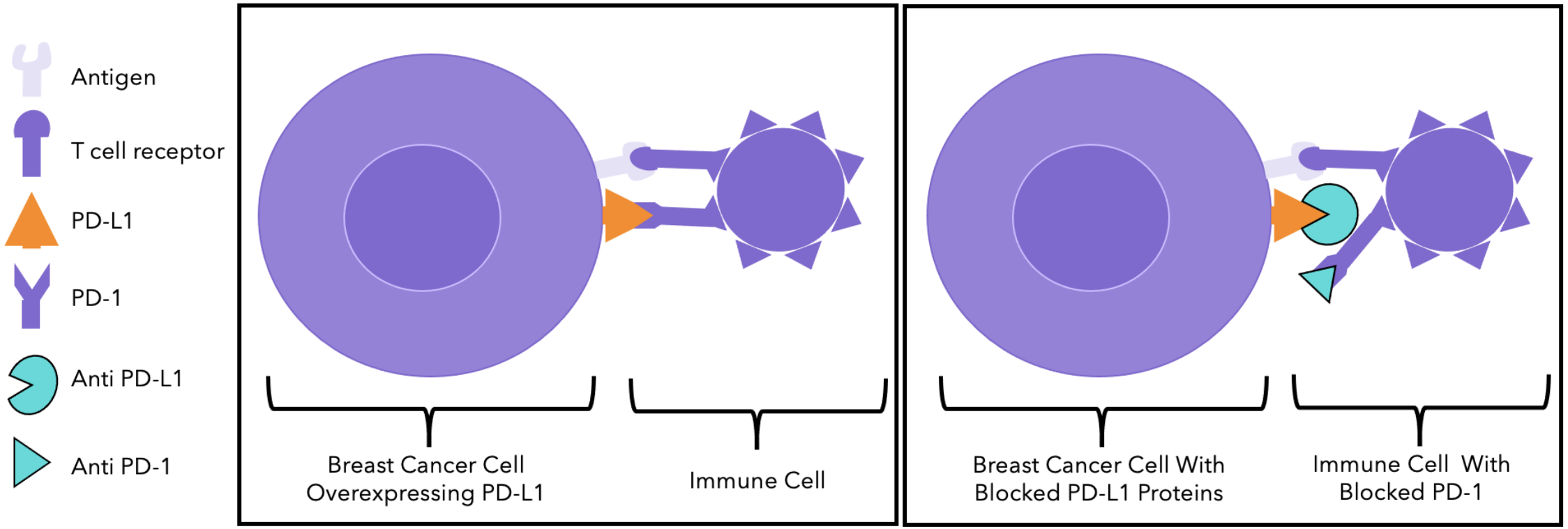
PANKU-Breast01



Iza-Bren Cuts Progression Risk by 59%

Lan B, Shi Y, Shao X et al. Izalontamab brengitecan for HR+/HER2– breast cancer in China (PANKU-Breast01): a randomised, phase 3 trial. The Lancet, 2026. Also in trials for triple negative.

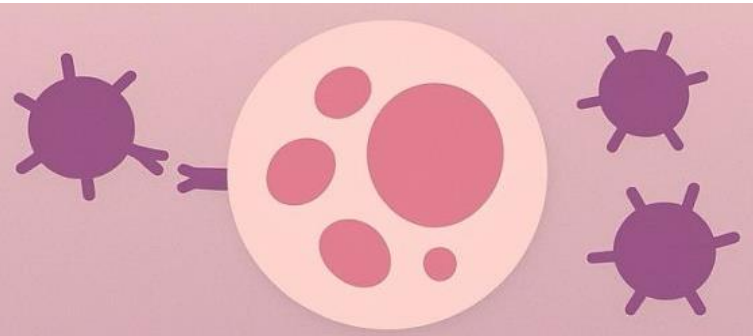




McArthur HL, et al. TROPION-Breast04: a randomized phase III study of neoadjuvant datopotamab deruxtecan (Dato-DXd) plus durvalumab followed by adjuvant durvalumab versus standard of care in patients with treatment-naïve early-stage triple negative or HR-low/HER2- breast cancer. Ther Adv Med Oncol. 2025 Feb. PMID: 39917260.

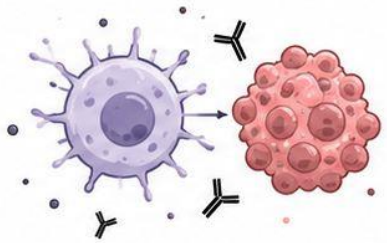
KEYNOTE-756:
Immunotherapy Expands Beyond TNBC

Old Paradigm	New Paradigm
Immunotherapy = TNBC only	HR+ also joining the list



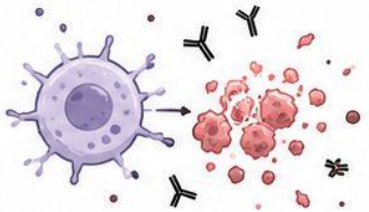
Hormone-receptor positive cell

- Increased pCR
- Improved EFS
- Awaiting long-term OS



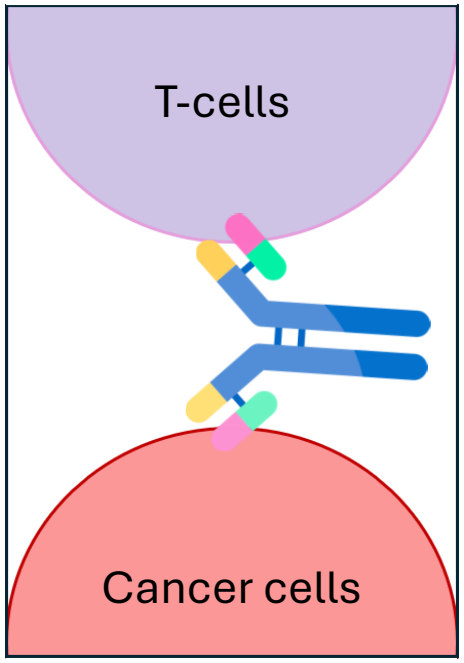
Immunotherapy:

Teaching Your Body to Fight Cancer

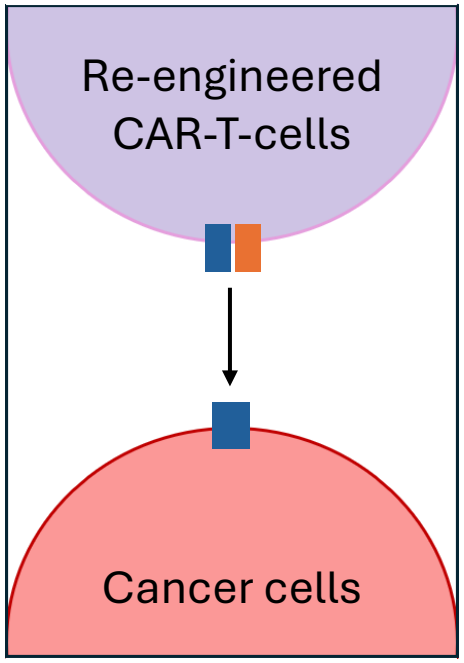


Immunotherapy

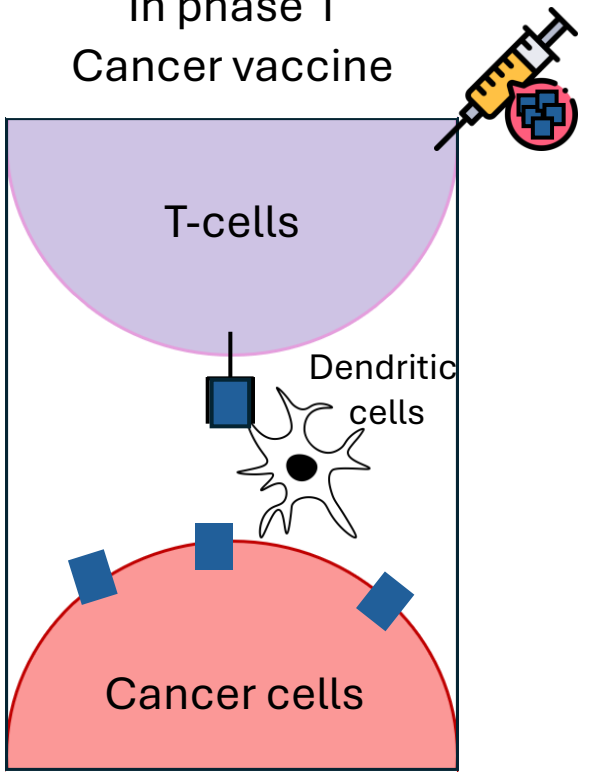
In phase 2/3
Bi-specific antibodies

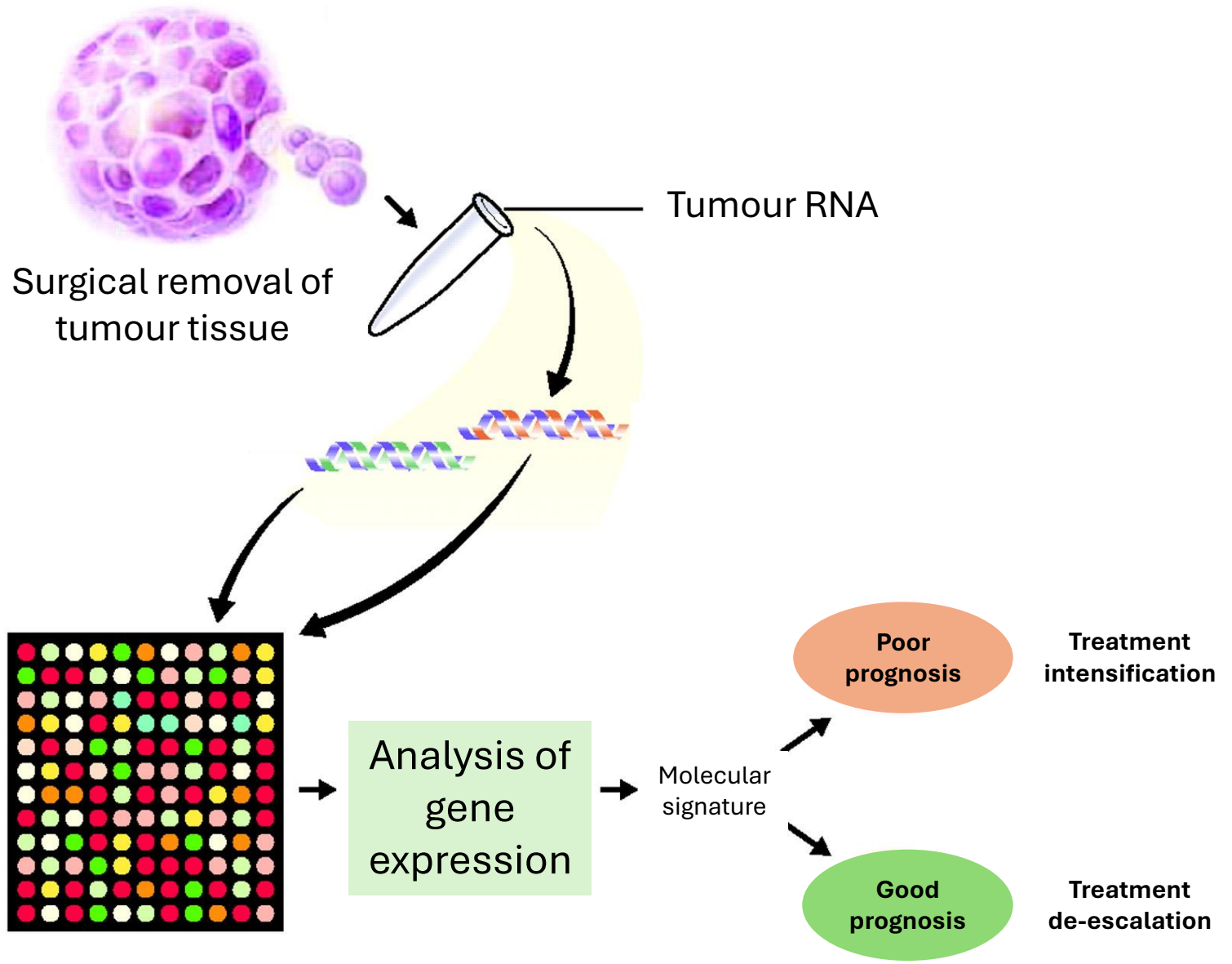


Experimental
CAR-T therapy



In phase 1
Cancer vaccine




Surgical removal of tumour tissue
Tumour RNA
Analysis of gene expression
Molecular signature
Poor prognosis
Treatment intensification
Good prognosis
Treatment de-escalation

OPTIMA TRIAL

68%

MAY AVOID CHEMOTHERAPY

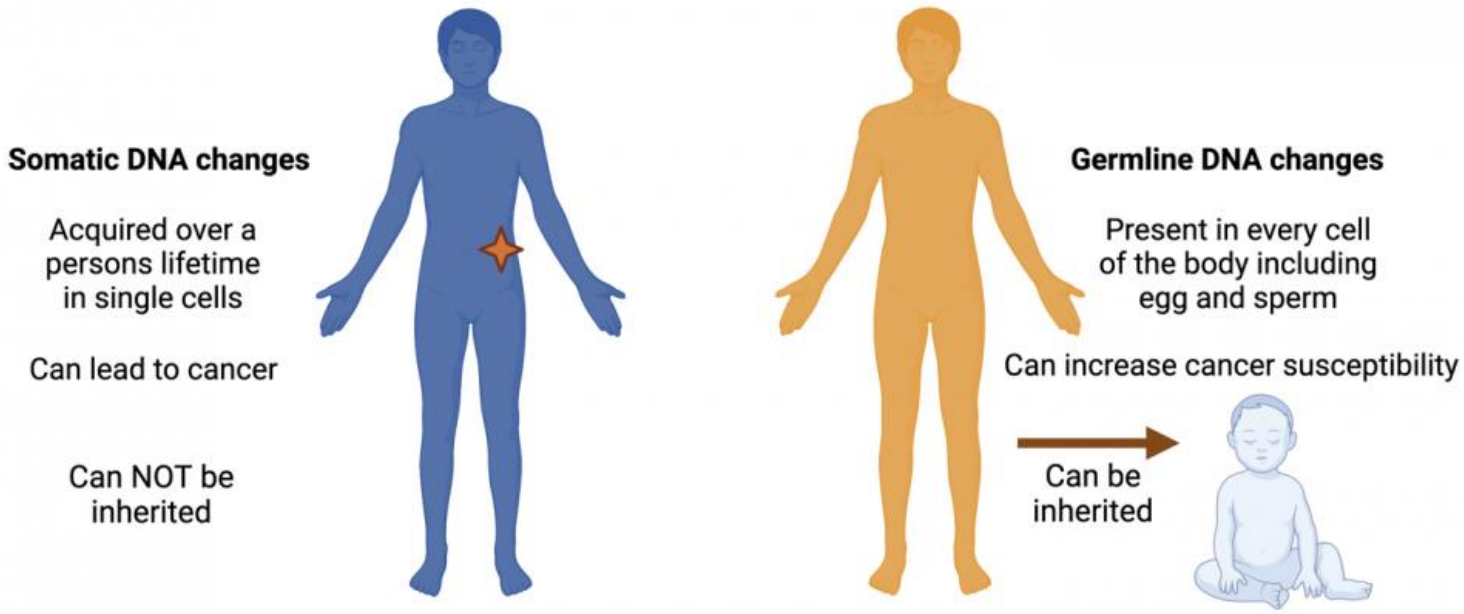
First results from the OPTIMA phase III randomized non-inferiority trial of test-directed chemotherapy in patients with high clinical risk ER-positive HER2-negative early breast cancer



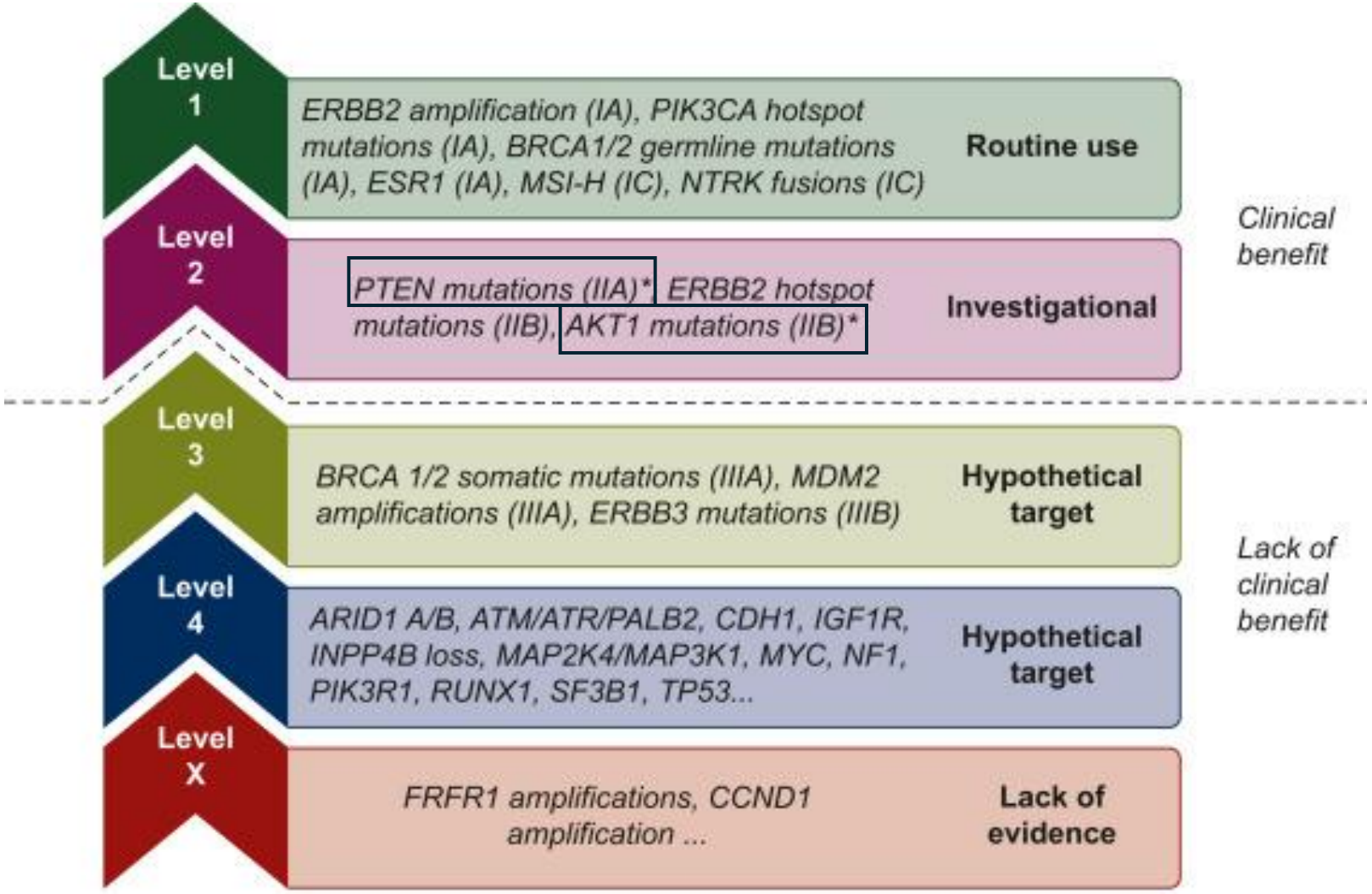
DNA Testing:

Blood tests vs tissue tests

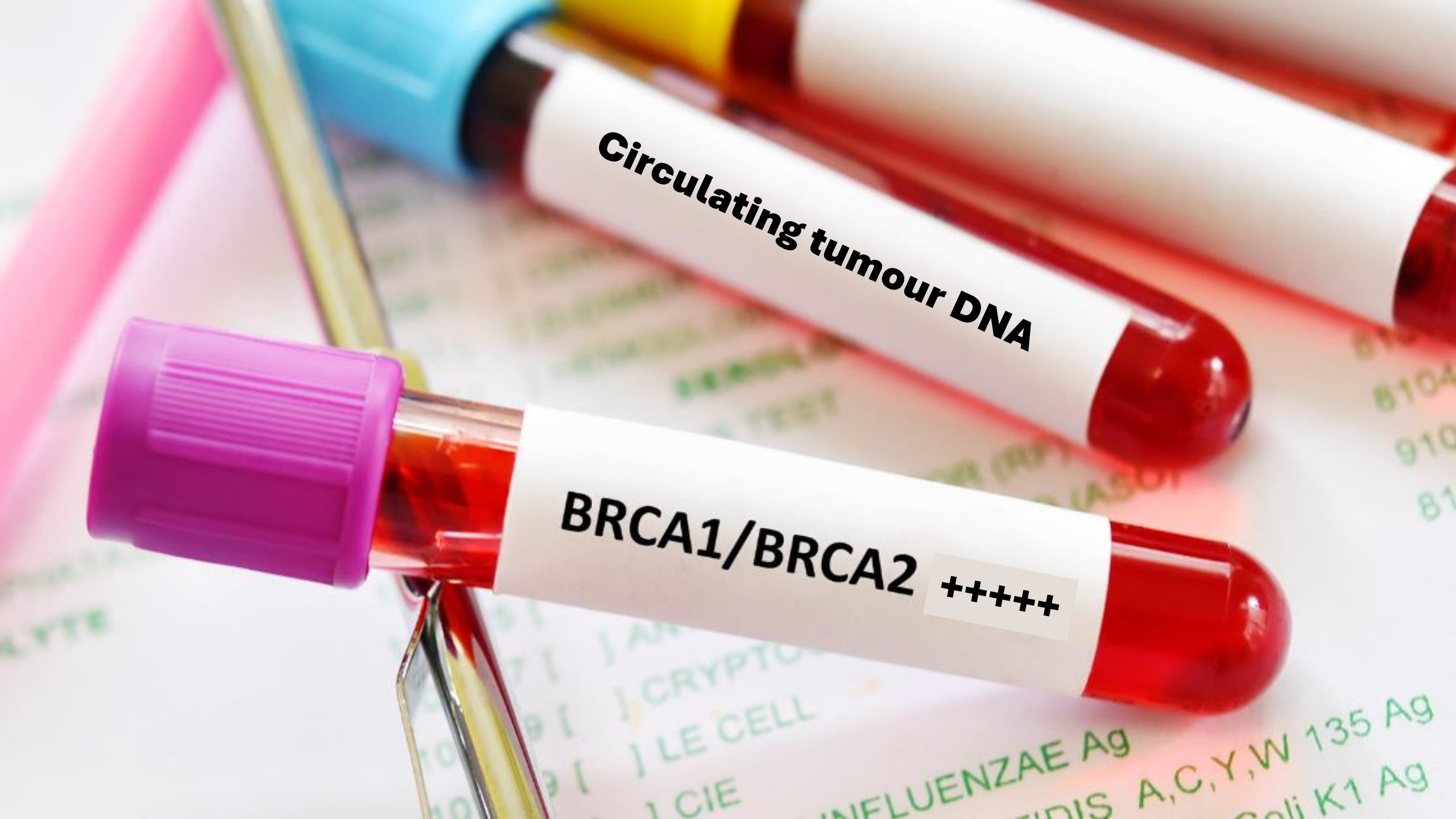
Germline testing vs somatic testing

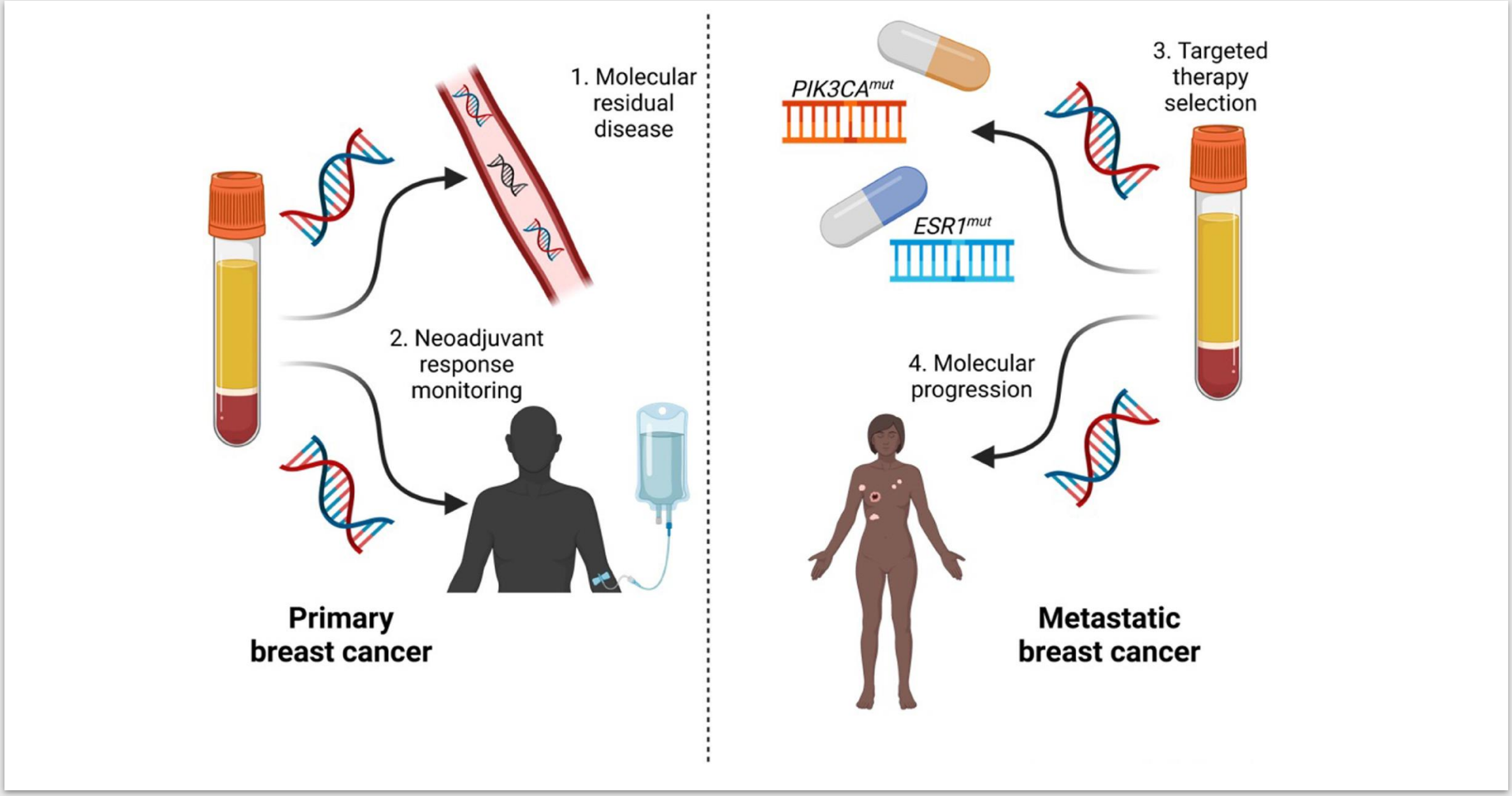


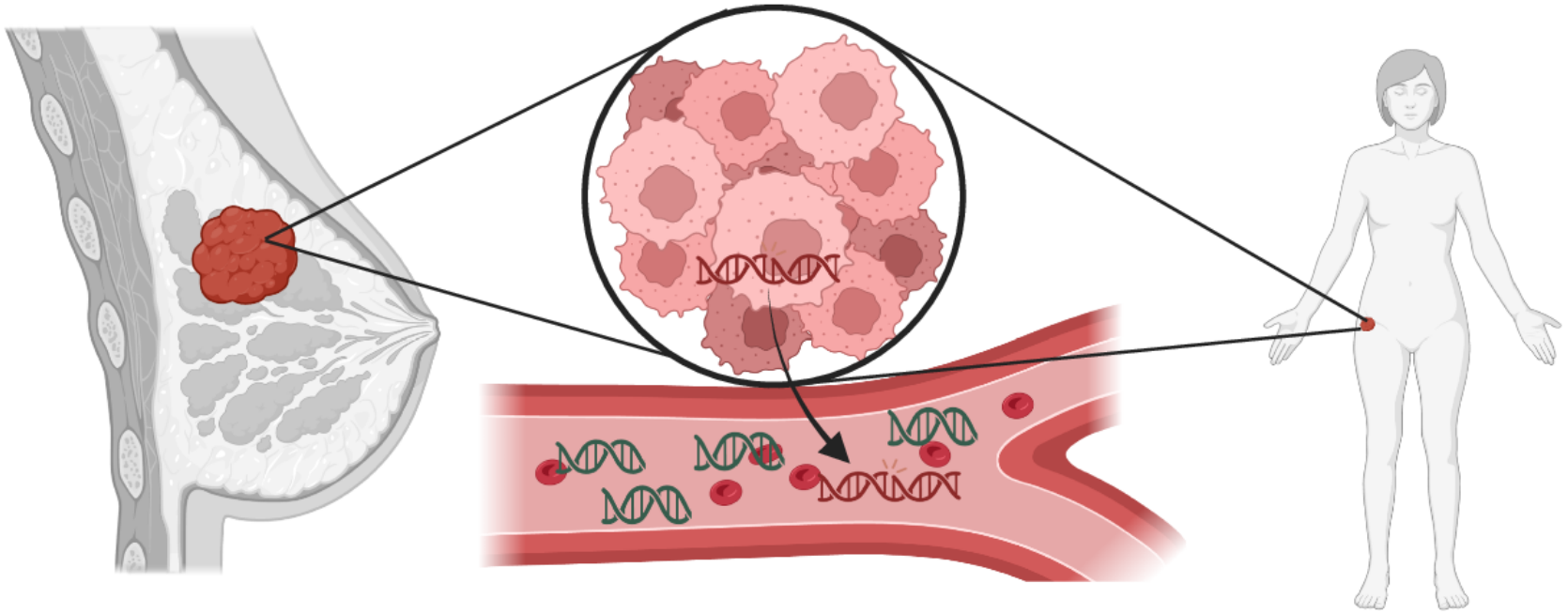




Bottosso M, et al. Moving toward precision medicine to predict drug sensitivity in patients with metastatic breast cancer. ESMO Open, 2024.


Circulating tumour DNA
BRCA1/BRCA2 +++++


1. Molecular residual disease
2. Neoadjuvant response monitoring
Primary breast cancer
PIK3CA^mut
ESR1^mut
3. Targeted therapy selection
4. Molecular progression
Metastatic breast cancer



Screening

- Complement mammography
- Pan-cancer detection

Neoadjuvant & adjuvant chemotherapy

- Prognostication
- Treatment escalation or de-escalation

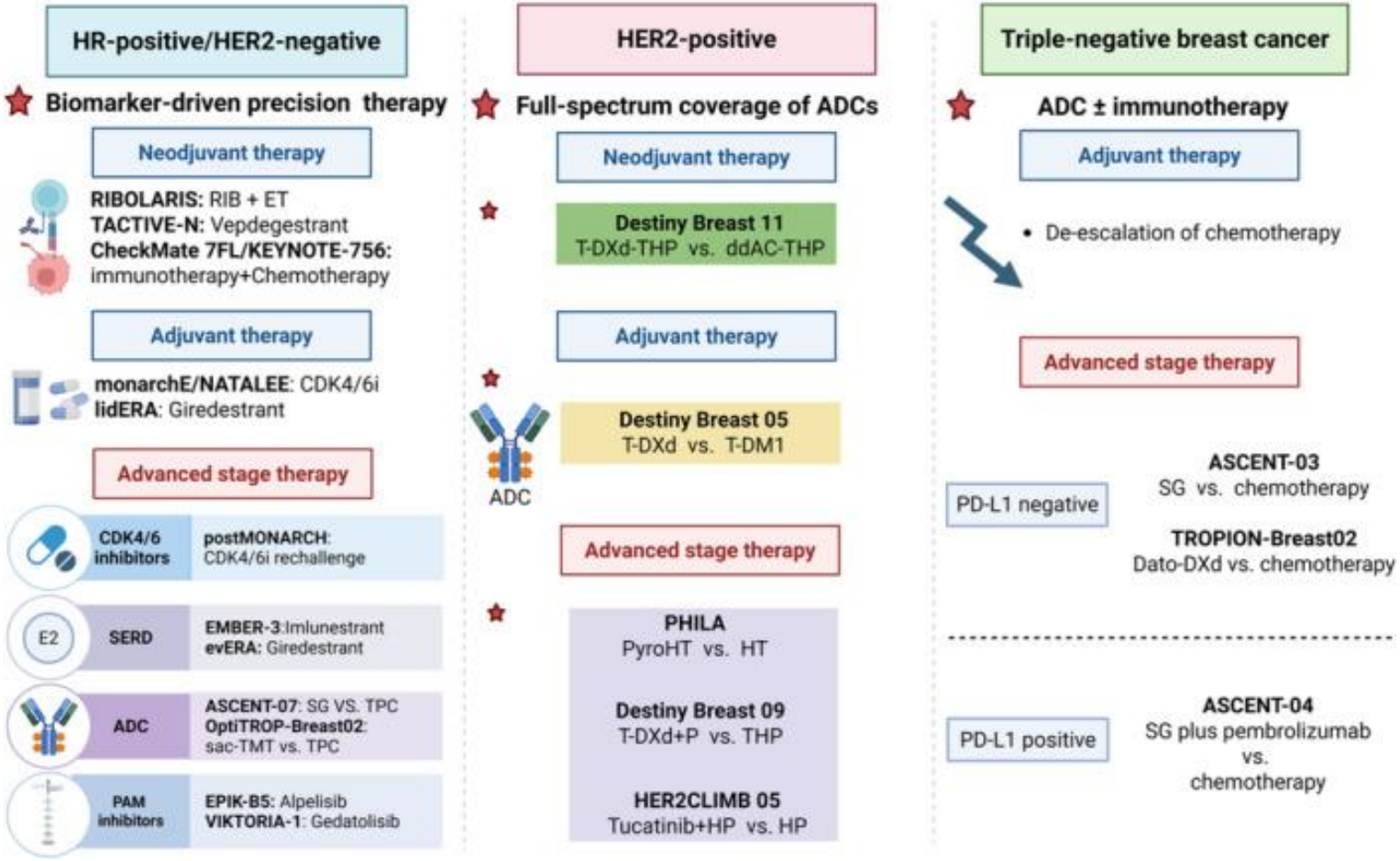
Minimal residual disease

survivor

- Early relapse detection
- Treatment escalation

Clinical Advances in Breast Cancer

Comprehensive Overview of Full-Course Disease Management



Peng X et al. Clinical Advances in Breast Cancer: A Comprehensive Overview of Full-Course Disease Management. Cancer Innov. 2026 Aug. PMID: 42621907.

Access to Precision Medicine

- Access to genomic and biomarker testing
- Access to precision medicine for people with breast cancer
- Current challenges, opportunities, and available resources

Steps to Biomarker-Driven Targeted Cancer Therapy to Improve Patient Outcomes

Challenge: Knowledge and Health Literacy Gaps



Patient recieves a targeted therapy



Test is performed, interpreted, and identifies a therapeutic selection biomarker



Patient's insurance provides test coverage

Challenge: Funding



Provider orders appropriate test and the clinical facility is equipped with testing infrastructure

Challenge: Disparities and Geography



Patient is diagnosed with cancer and a biopsy is performed

Challenge: Timing & Coordination Gaps



Development of reliable, valid, and relevant biomarker tests

American Cancer Society Cancer Action Network. Improving Access to Biomarker Testing Report

Available Resources and Advocacy



Patient Advocacy and Educational Toolkits



Specialized Research Centers & Programs



Patient Navigators

The Future of Breast Cancer Care is Yours

