Markey Cancer Center

NCI Comprehensive Cancer Center
A Cancer Center Designated by the National Cancer Institute

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Minimal Residual Disease in Solid Tumors

Presenter : Reema Anil Patel, MD

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DISCLOSURES

I have nothing to disclose.

Learning Objectives

Define ctDNA

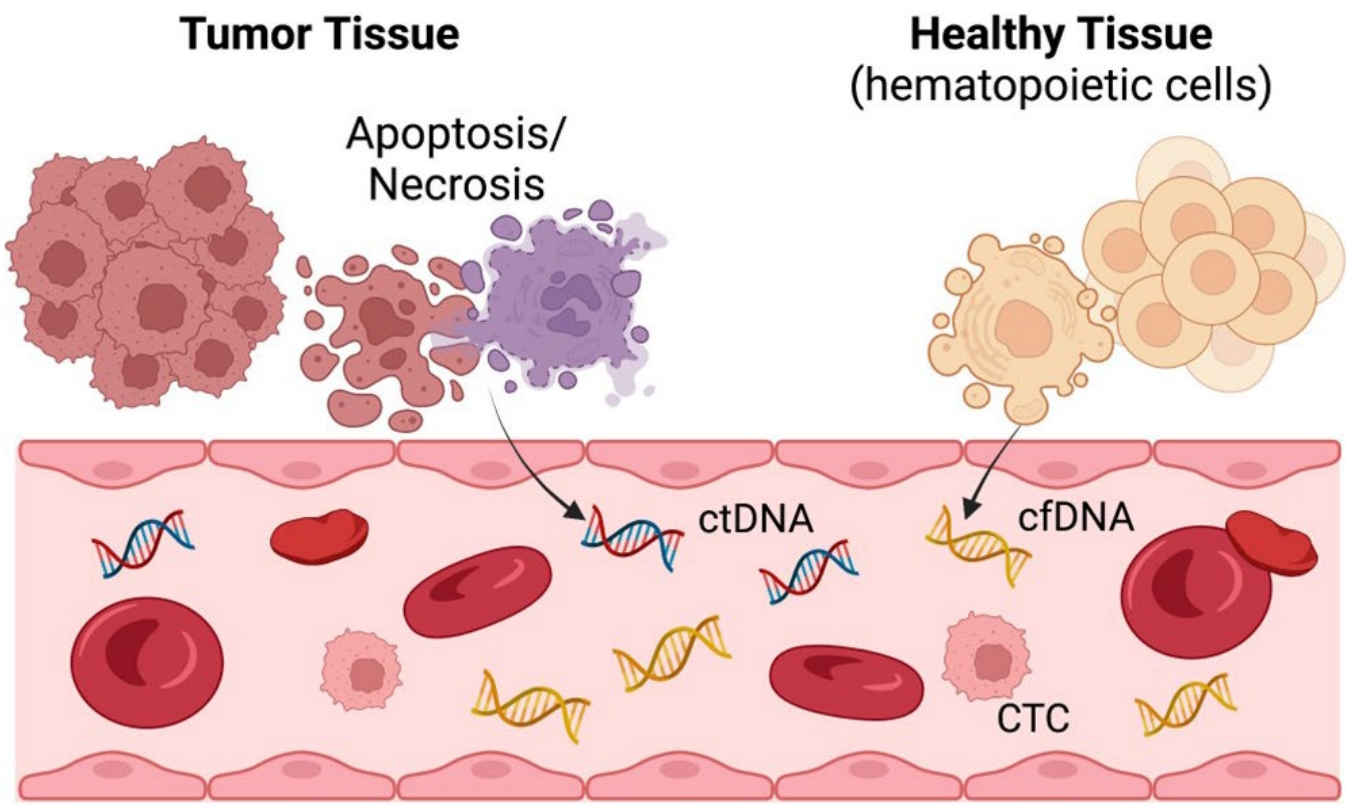
Review current data across multiple solid tumors

Discuss the future

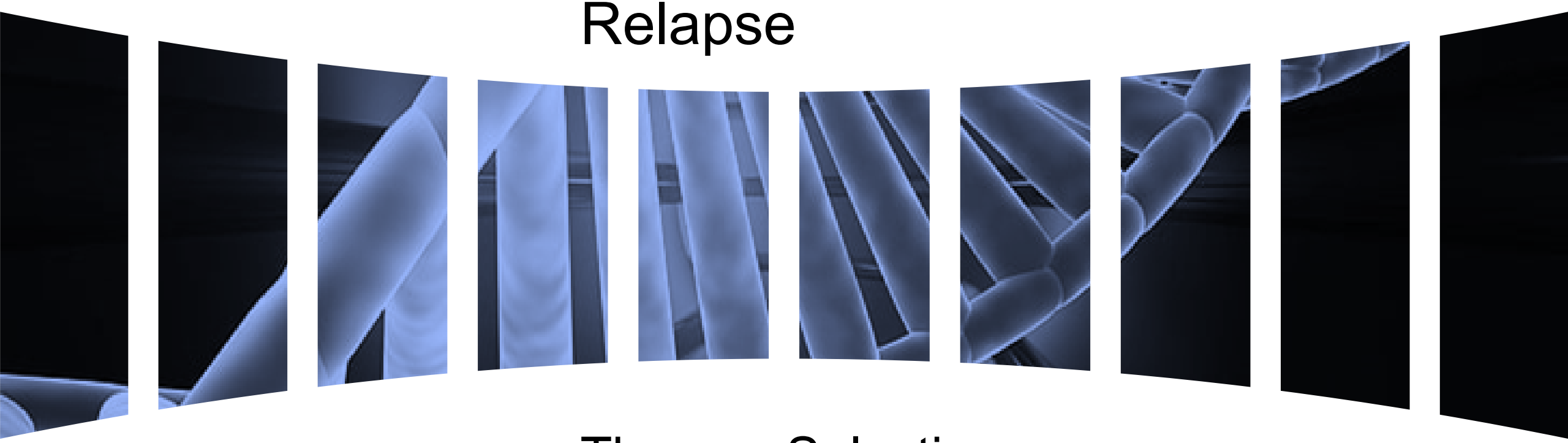
The Basics of ctDNA

Cell free DNA (cfDNA): small DNA fragments in circulation, released via cell death

Circulating tumor DNA (ctDNA): small fragments released from tumors in patients with cancer.
Can detect epi(genomic changes) that are cancer-specific



Early Detection
Diagnosis
Minimal residual disease
Relapse



Therapy Selection
Response to therapy
Resistance

ctDNA as a Key MRD Marker

Early Detection

ctDNA analysis allows for early detection of residual disease, potentially before clinical symptoms develop

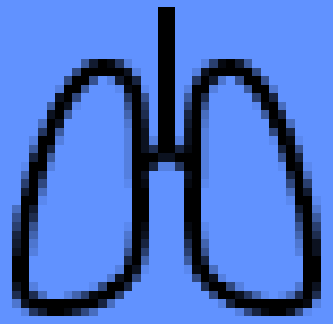
Treatment Response

Monitoring ctDNA levels can help track treatment response and predict potential relapse.

MRD in Solid Tumors

(current data)

Lung

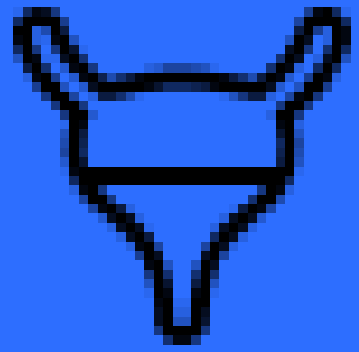


MRD in adjuvant setting is predictive and prognostic

Identifies patients at highest risk of recurrence/relapse and who may benefit most from adjuvant chemotherapy

Sustained MRD prognostic of disease free survival

Bladder



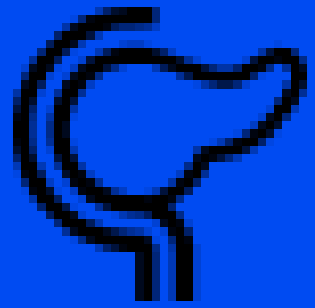
In muscle invasive bladder cancer, detectable ctDNA is prognostic for recurrence

ctDNA dynamics correlated with pathologic downstaging

utDNA clearance predicts pCR, optimize selection of patients who would benefit from bladder preservation surgery

Integration of ctDNA & utDNA for surgery and adjuvant therapy

Pancreas



MRD in resectable, locally advanced or metastatic can be prognostic , specifically clearance of KRAS mutations

Gastric

Detectable ctDNA perioperative prognostic

Role for intensification of adjuvant therapy?

Colon

MRD in adjuvant setting is predictive and prognostic

Identifies patients at highest risk of recurrence/relapse and who may benefit most from adjuvant chemotherapy

Sustained MRD prognostic of disease free survival

Detection of certain mutations can predict drug resistance

Challenges in MRD

1

Sensitivity and Specificity

Achieving high sensitivity and specificity in MRD detection remains a technical challenge.

2

Cost and Accessibility

The high cost & turn around time of MRD testing can limit its availability for all patients.

3

Standardization

Lack of standardization across different platforms and laboratories presents a barrier to consistent results.

Futured of MRD

Liquid Biopsy Advancements

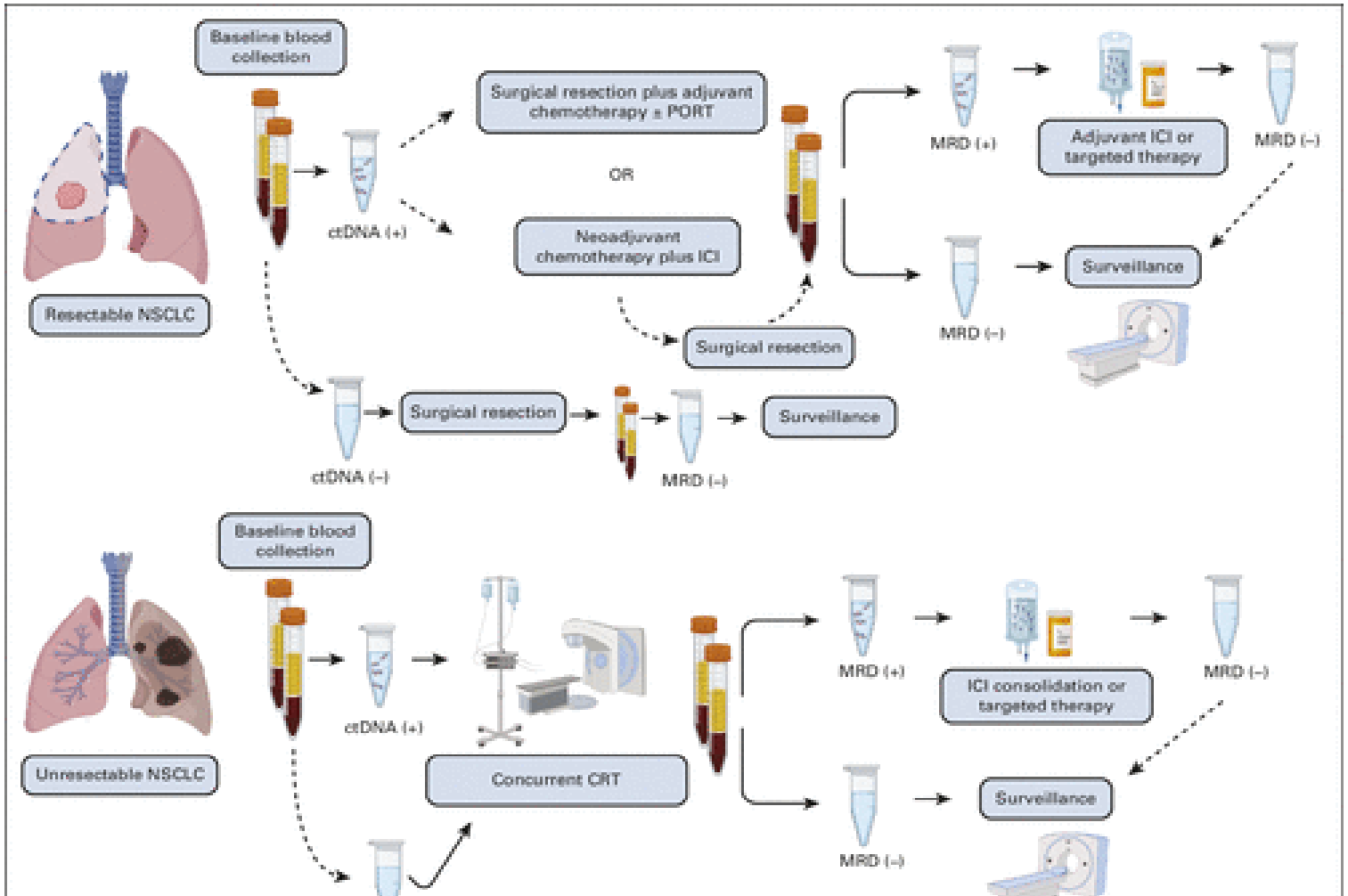
Advances in liquid biopsy technologies promise more sensitive and reliable MRD detection.

Artificial Intelligence (AI)

AI-powered algorithms are being developed to improve the accuracy and speed of MRD analysis.

Personalized Medicine

MRD testing will play a crucial role in driving personalized medicine targeted therapies.


Baseline blood collection
Resectable NSCLC
ctDNA (+)
Surgical resection plus adjuvant chemotherapy ± PORT
OR
Neoadjuvant chemotherapy plus ICI
Surgical resection
MRD (+)
Adjuvant ICI or targeted therapy
MRD (–)
MRD (–)
Surveillance
ctDNA (–)
Surgical resection
MRD (–)
Surveillance
Baseline blood collection
Unresectable NSCLC
ctDNA (+)
Concurrent CRT
MRD (+)
ICI consolidation or targeted therapy
MRD (–)
MRD (–)
Surveillance

“Far and away the best prize that life offers is the chance to work hard at work worth doing.”

Theodore Roosevelt

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THANK YOU

For more information contact

Dr. Reema Patel

reema.patel@uky.edu