

Innovation in Oncology

Prof Jennifer Westrup

Innovations in Oncology

How can we find cancers earlier?

How can we personalise treatment?

How can we expand our treatment arsenal?

What is new at Beacon?

- Cancer Detection with a blood test
- Molecular Testing
- Repurposing and combining therapies

Blood Tests for Cancer

Recommended Screening for 5 Cancers

- Breast, colon, prostate, cervical, lung
- 60% of cancers arise from areas with no screening programs

Diagnoses of Cancer

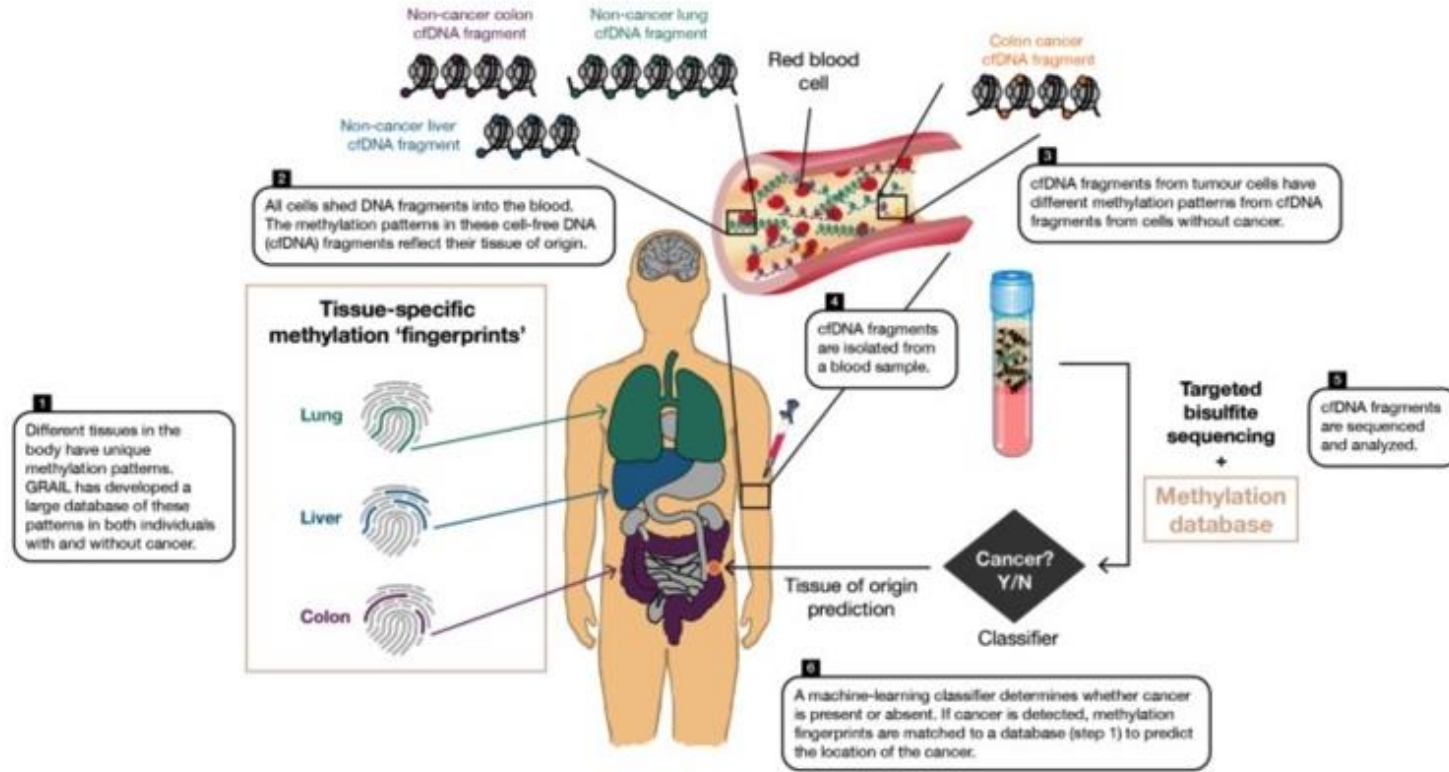
- 5-year survival of localized cancer: 89%
- 5-year survival of metastatic cancer: 21%

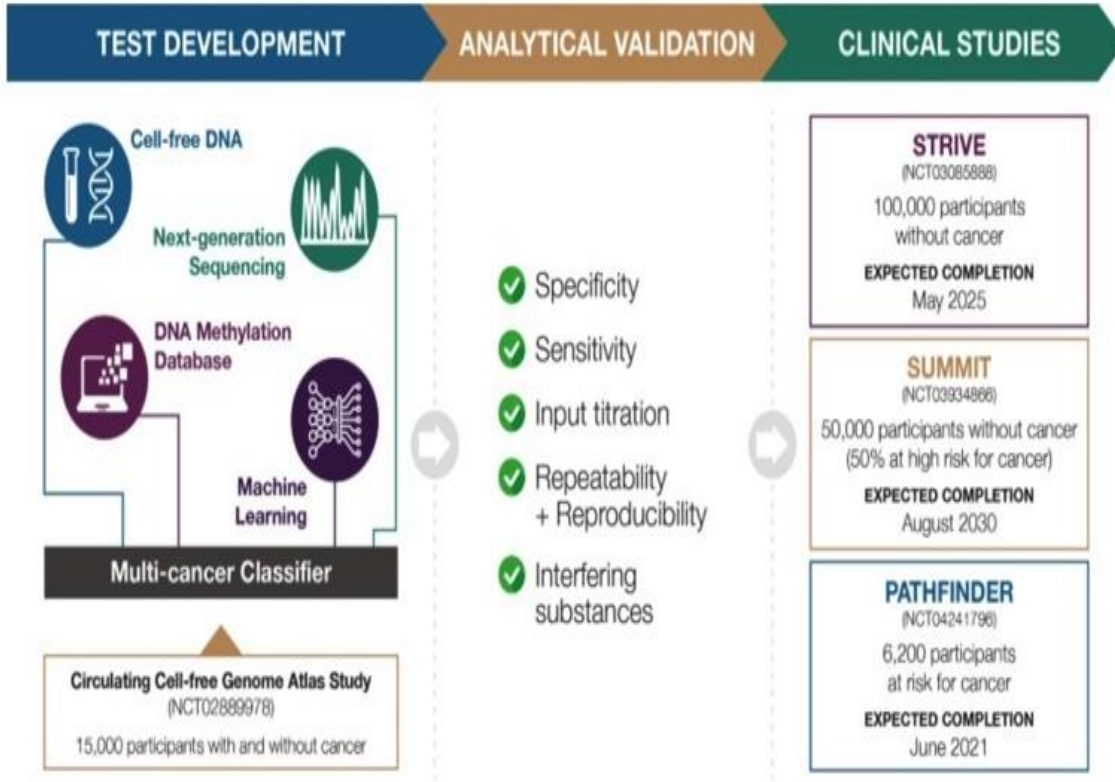
Grail Biotech

- Galleri Blood test, single tube
- Simultaneous test for 50 different cancers
- Tests for tumour DNA in the blood stream
- Available on prescription



Grail: Early Multi-Cancer Detection

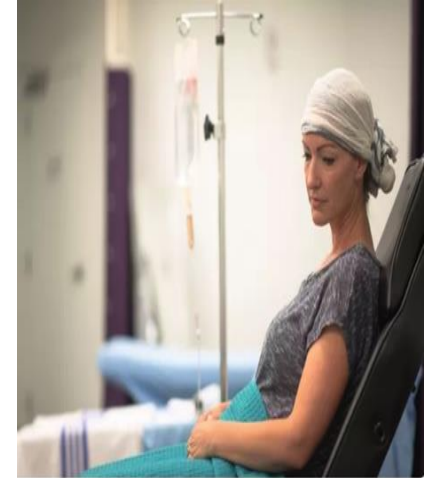
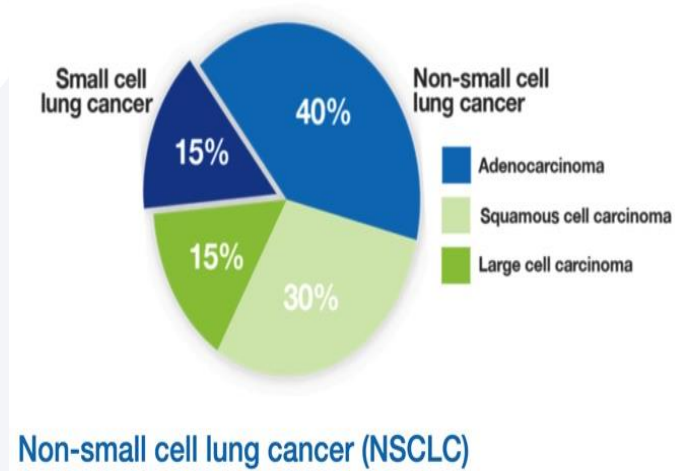




PATHFINDER

- N=6,629
- 29 cancers
- >50% detected Stage I-III
- PPV 44.6%
 - Among those with a positive test the probability of disease is 44.6%

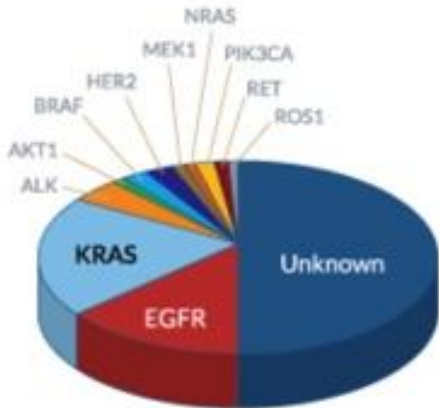
Molecular Profiling



Molecular Profiling



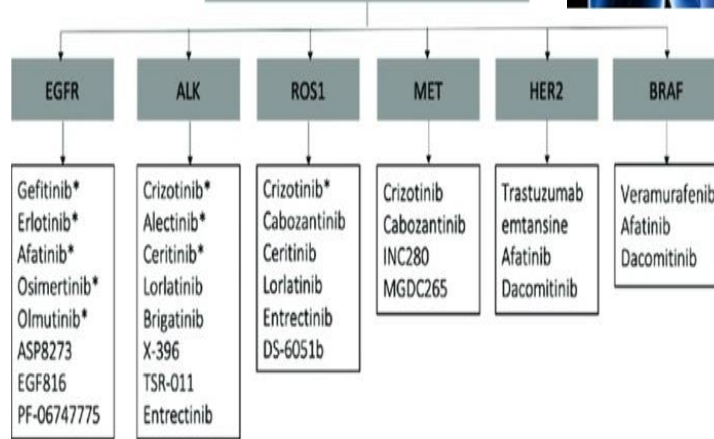
Molecular Subsets of Lung Cancer Defined by Driver Mutations



Frequency of Driver Mutations in NSCLC, %	
AKT1	1
ALK	3-7
BRAF	1-3
EGFR	10-35
HER2	2-4
KRAS	15-25
MEK1	1
NRAS	1
PIK3CA	1-3
RET	1-2
ROS1	1

www.mylungcancer.org

COMMON MUTATIONS IN NSCLC



Available molecular targeted drugs for NSCLC [87]. * FDA-approved drugs for NSCLC.



Molecular Profiling of Tumour Tissue

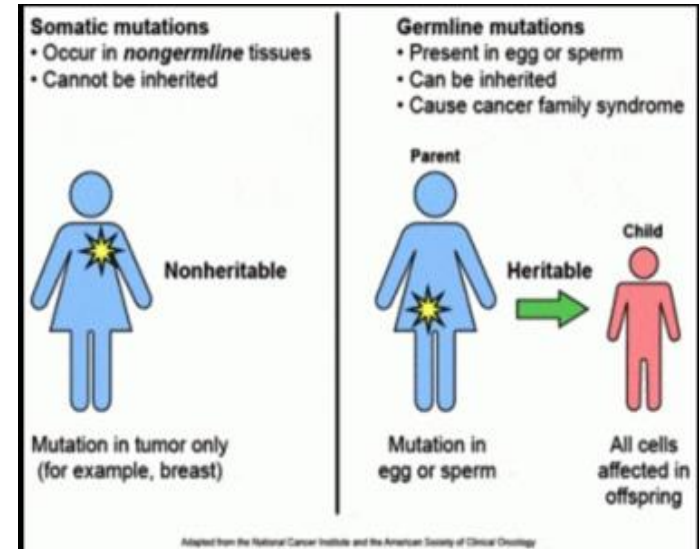
Discovering molecular alterations to identify distinct molecular sub-classifications of disease for diagnostic, prognostic and therapeutic purposes.

Genetics -> Germline or Inherited Mutations

Genomics -> Somatic or Tumour Mutations

Example: Breast and Ovarian Cancer

- Germline BRCA
- Somatic BRCA
- Treatment: PARP-inhibitor



From Organs to Gene Alterations/Biomarkers *Tumor agnostic approval + New histology independent medicines*

The screenshot shows the FDA website's 'Drugs' section. A red box highlights the headline: 'FDA grants accelerated approval to pembrolizumab for first tissue/site agnostic indication'. Below the headline are social media sharing options and a link to a podcast. The article text states that on May 23, 2017, the FDA granted accelerated approval to pembrolizumab (KEYTRUDA) for adult and pediatric patients with unresectable or metastatic, microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR) solid tumors. The URL at the bottom is <https://www.fda.gov/drugs/informationondrugs/approveddrugs/ucm560040.htm> and it is cited as 'Annals of Oncology, Volume 29, Issue suppl_8'.

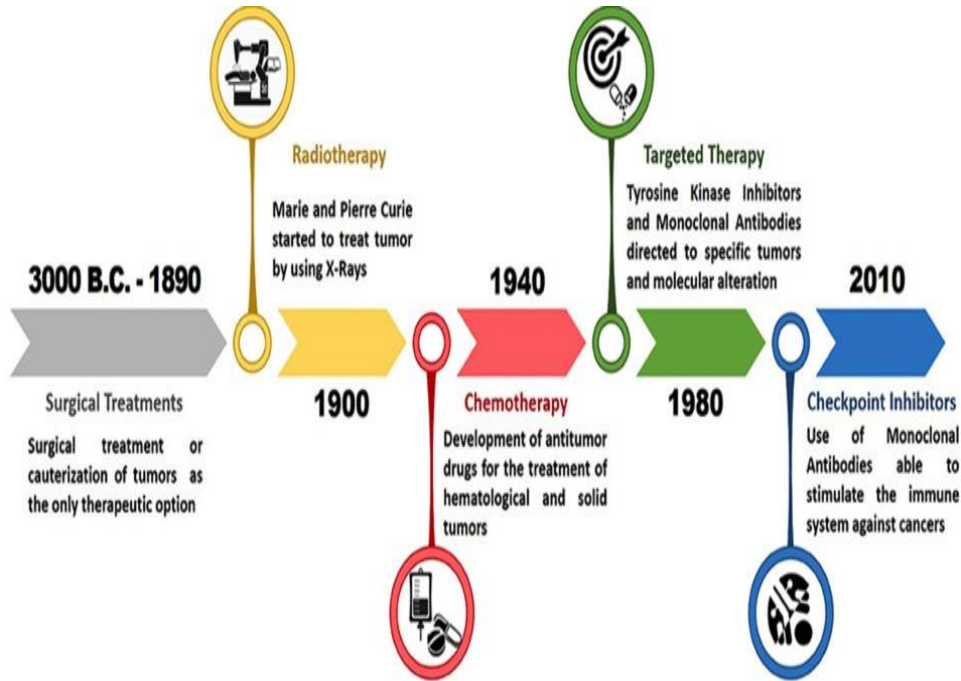
MOLECULAR PROFILING 101






Same diagnosis, different responses to treatment.
Molecular profiling is used to determine the appropriate therapy.



Cancer Treatments



	 Chemotherapy	 Targeted Therapy	 Immunotherapy
How does it work?	Targets rapidly dividing cells (mostly cancer cells)	Targets Proteins required for cancer growth	Uses our immune system against cancer
Side Effects	Hair loss, intestinal damage, nausea	Liver problems, diarrhea, skin rash	Autoimmune effects
Limitations	Cancer cells develop resistance to chemotherapy, not specific	Cancer cells develop resistance	Tailored and expensive

Cancer Treatments

- Chemotherapy
- Antibody Therapy
- Targeted Therapy
- Immunotherapy
- Dual Immunotherapy
- Combined Immunotherapy + Chemotherapy
- Combined Immunotherapy + Targeted Therapy
- mRNA Vaccines
- CAR-T Cells



NCCP Chemotherapy Regimen



Pembrolizumab, PACLitaxel and CARBOplatin (AUC 6) Therapy

INDICATIONS FOR USE:

INDICATION	ICD10	Regimen Code	Reimbursement Status
Pembrolizumab In Combination with CARBOplatin and PACLitaxel for the first-line treatment of patients with metastatic Squamous Non-Small Cell Lung Cancer (NSCLC)	C34	00579a	Pembrolizumab: ODMS 01/02/2021 CARBOplatin: Hospital PACLitaxel: Hospital

TREATMENT:

The starting dose of the drugs detailed below may be adjusted downward by the prescribing clinician, using their independent medical judgement, to consider each patients individual clinical circumstances.

Treatment is administered every 21 days for up to 4 cycles in combination with CARBOplatin and PACLitaxel followed by maintenance therapy of pembrolizumab every 21 days up or until disease progression or unacceptable toxicity develops

Beacon Hospital Cancer Centre



**Keep some room in your heart
for the unimaginable.**

—Mary Oliver,
"Evidence"

MEDICAL ONCOLOGY

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- Dr Rozana Rahman

Radiation Oncology

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- Professor Pierre Thirion
- Dr Siobhra O'Sullivan

Palliative Medicine

- Dr Eoin Tiernan

Haematology

- Dr Patrick Hayden



A large, stylized, light blue 'S' shape is positioned on the left side of the slide, partially overlapping the main text area. The background is a solid, medium blue color.

Thank you