



Lung Cancer-related risk factors and their Impact Assessment

HORIZON-MISS-2021-CANCER-02

LUCIA Workshop – Understanding Lung Cancer

San Sebastian, Sept. 5th, 2023

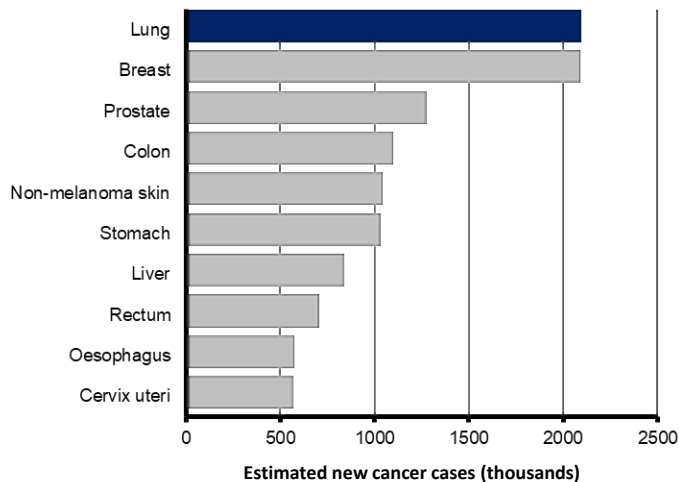
Mónica Saiz Camín, MD
Osakidetza (Basque health Service)



HISTOLOGICAL SUBTYPES AND MOLECULAR ANALYSIS OF LUNG CANCER

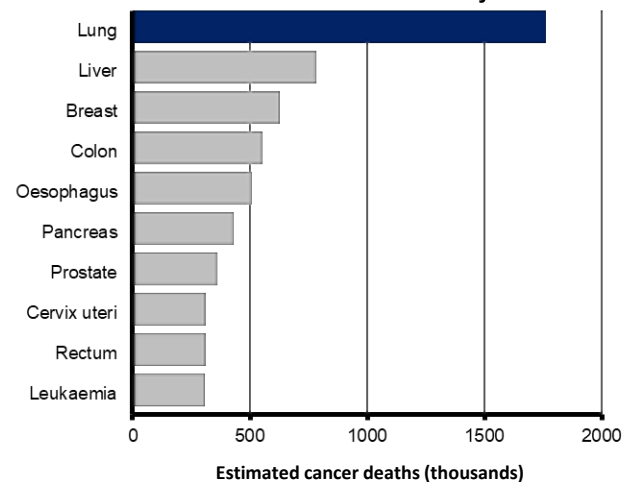
Mónica Saiz Camín, MD
Cruces University Hospital
Osakidetza (Basque Health Service)

Worldwide annual incidence



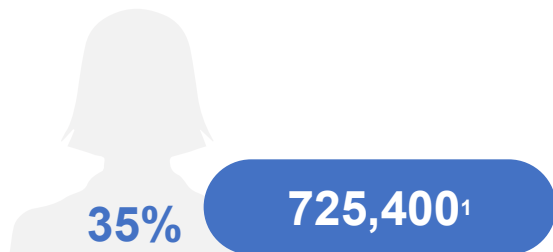
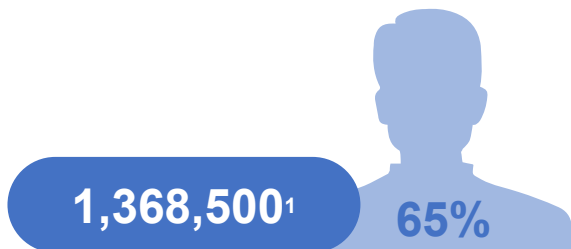
2.1 million
new cases per year

Worldwide annual mortality

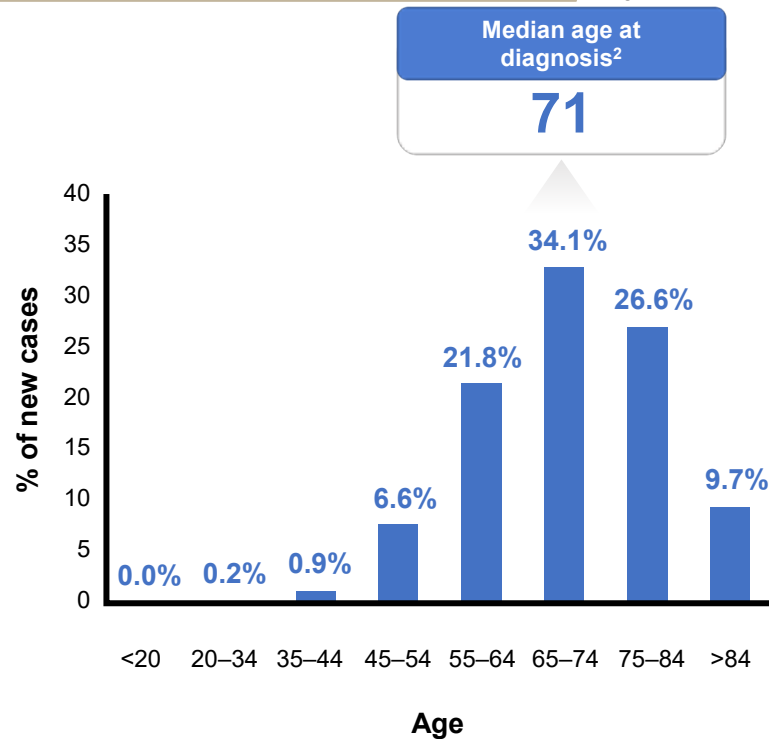


1.8 million
deaths per year

Lung cancer has been the most common cancer in the world for several decades and remains the leading cause of cancer-related deaths

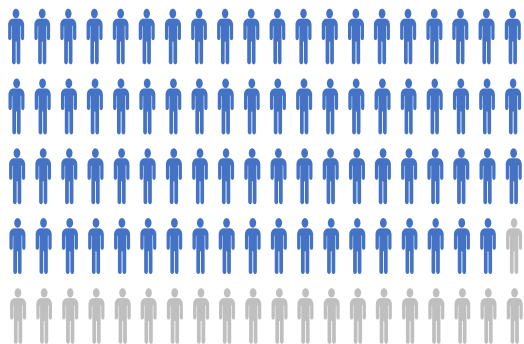


Annual incidence

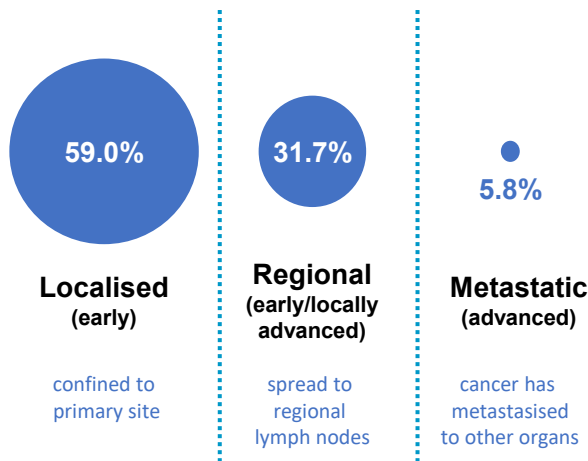


Lung cancer affects more men than women, and incidence increases with age

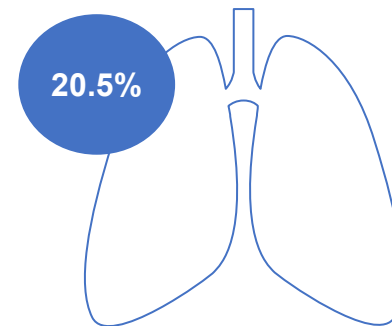
79% patients initially present with regional or metastatic disease



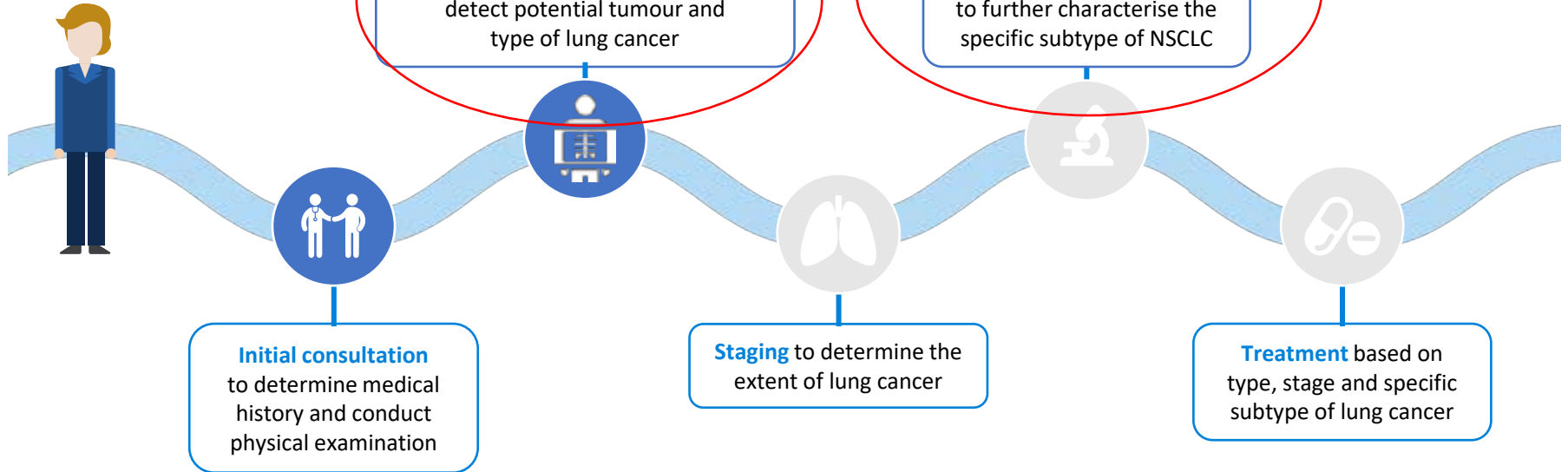
5-year survival by disease type



Overall 5 year survival (all types)



The majority of lung cancer patients initially present with regional or metastatic disease and this significantly and adversely affects their survival outcomes

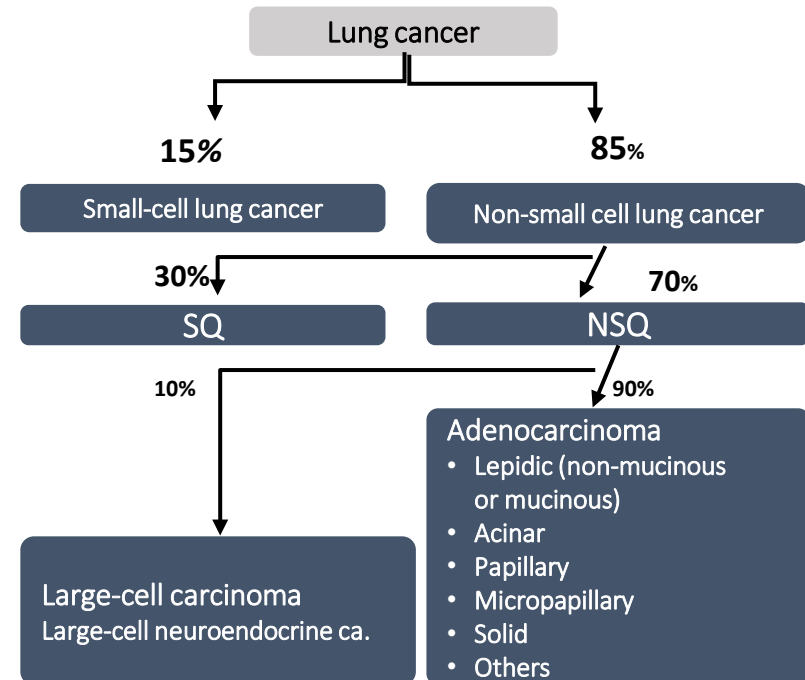


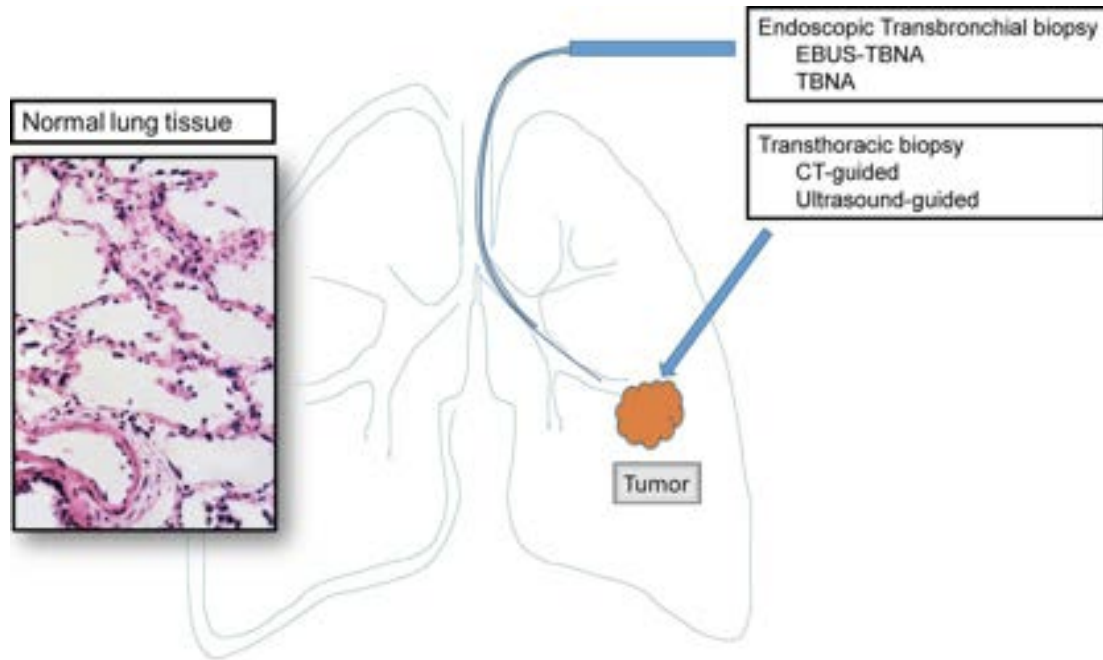
Typical patient journey from diagnosis to treatment

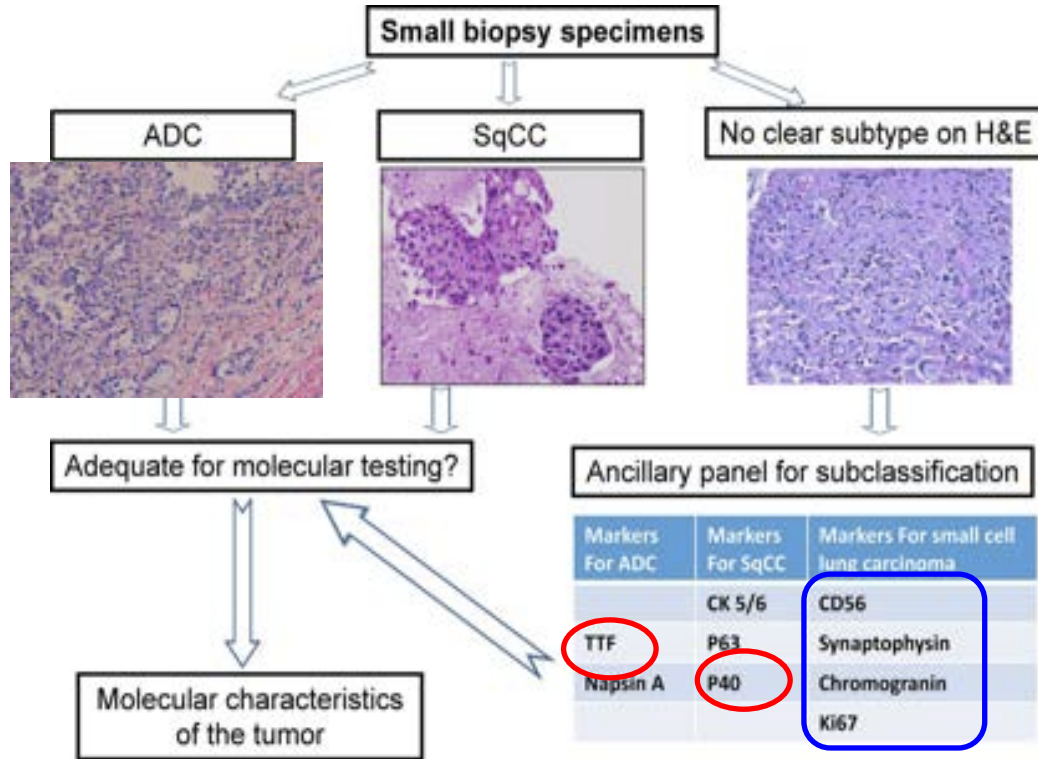
Accurate diagnosis enables the right treatment decision for the patient

Histological subtypes

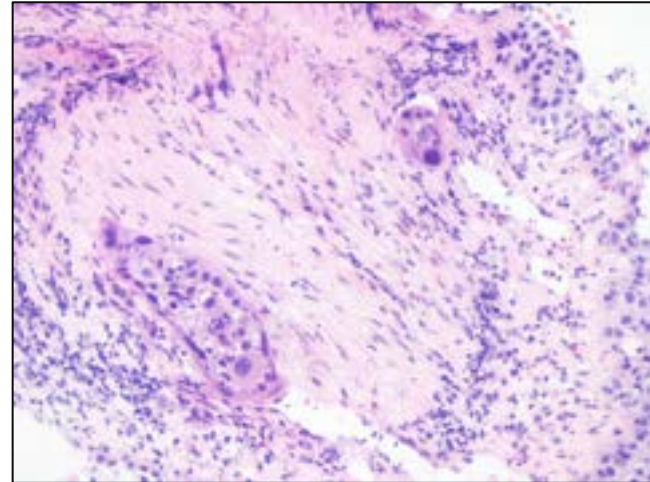
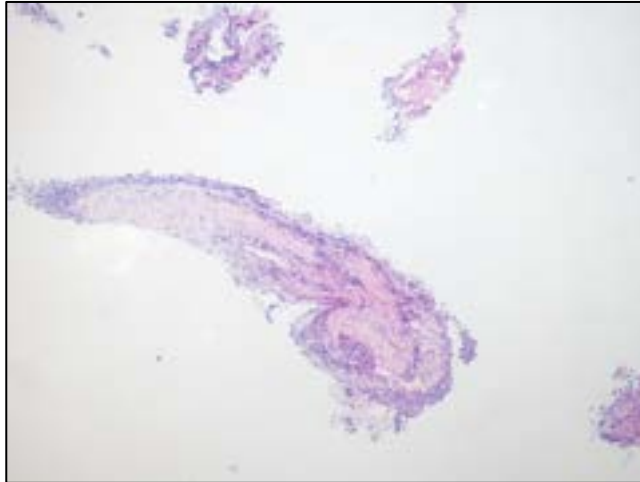
- Small cell lung cancer (SCLC, 15%) and non-small cell lung cancer (NSCLC, 85%)
- NSCLC: heterogeneous disease that can be divided into **four main subtypes**: adenocarcinoma, SQ-cell carcinoma, large-cell carcinoma and others (neuroendocrine, sarcomatoid...)



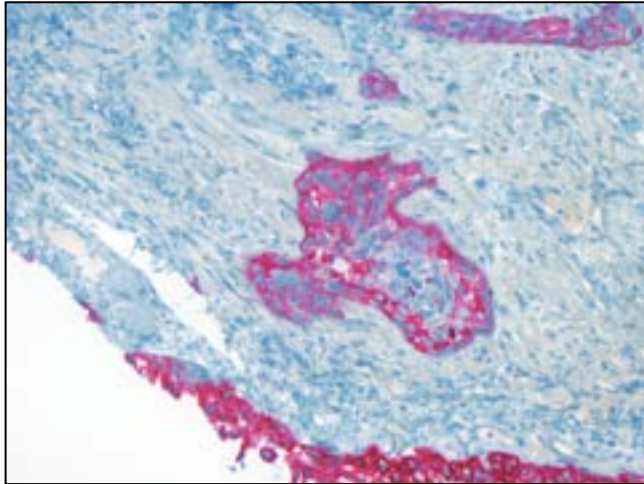




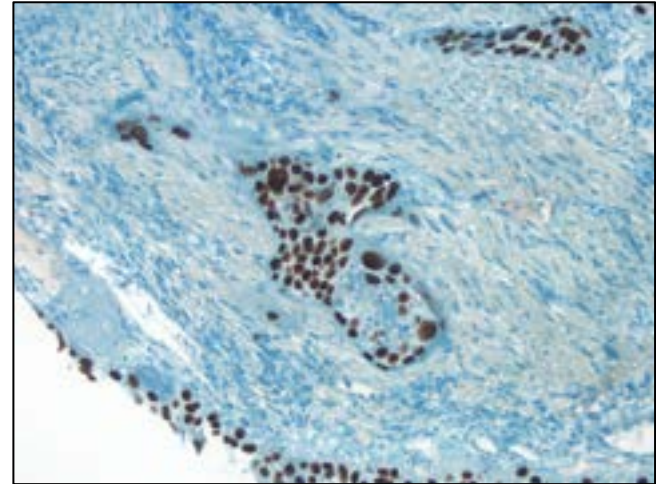
- Small diagnostic sample (bronchoscopy biopsy)



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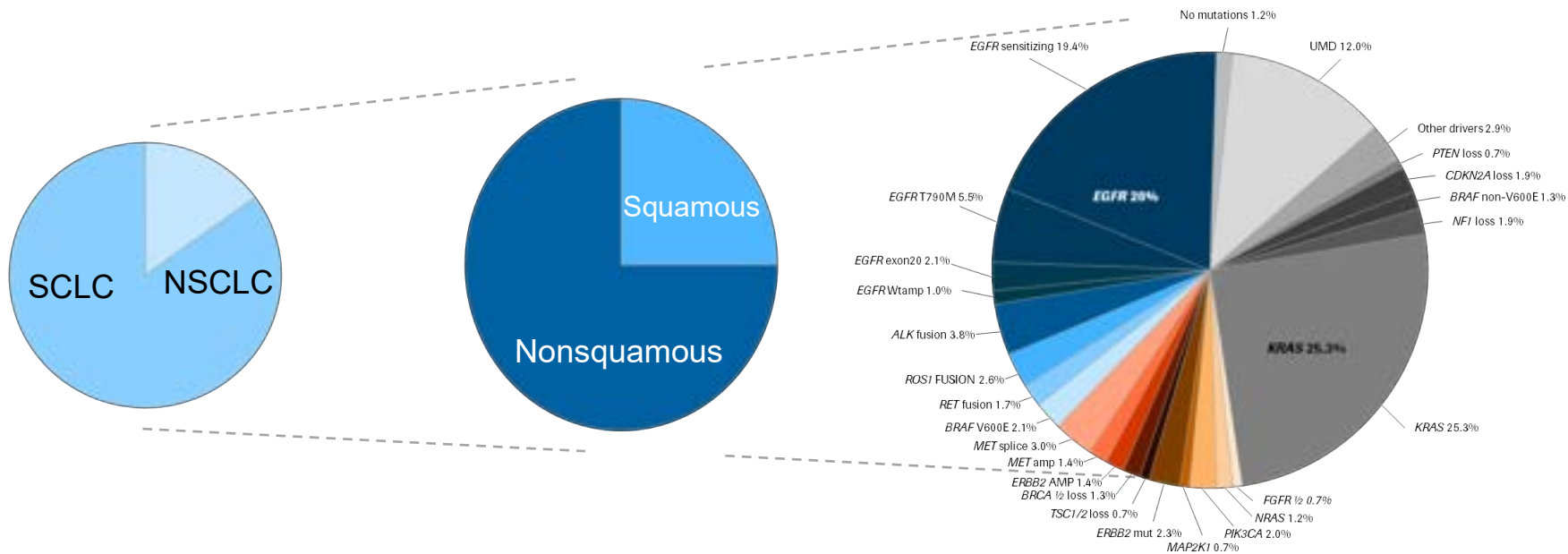


p40-CK5/6



TTF1-CK7

Molecular subgroups and emerging therapies



Spectrum of oncogenic drivers associated to 860 patients with lung adenocarcinoma identified by MSK-Impact.
 SCLC: small cell lung cancer, NSCLC: non-small cell lung cancer; UMD: no actionable mutation.
 1. Bode, A. M., and Dong, Z., (2018) *npj Precision Onc* 2:1; 2. Jordan EJ et al. (2017) *Cancer Discov.* 2017; 7: 596-609.



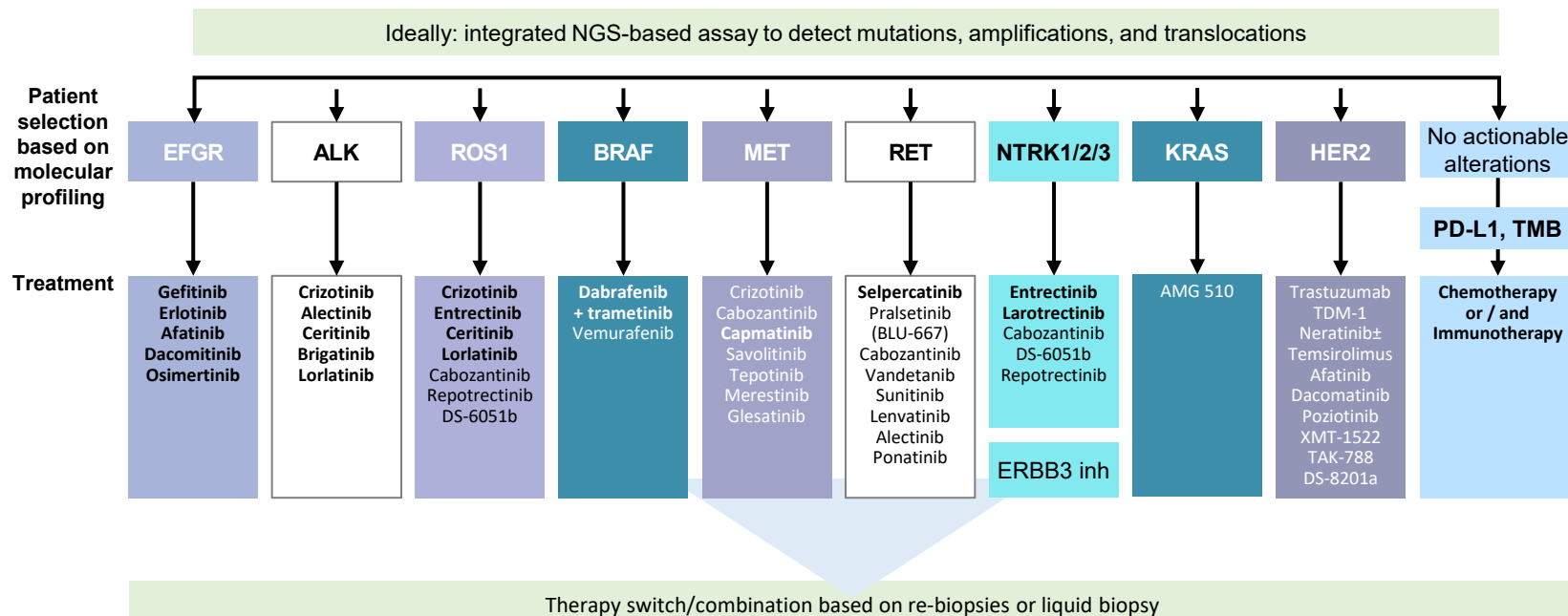
Time, January 15, 2001 | Vol. 157 No. 2

Personalized Medicine

The ability to offer

- The Right Drug
- To The Right Patient
- For The Right Disease
- At The Right Time
- With The Right Dosage





- ***Bold text = approved FDA and/or EU as of May 2020**
- Rosell and Karachaliou. Lancet 2016




Clinical and Translational Oncology

<https://doi.org/10.1007/s12094-022-03046-9>

SPECIAL ARTICLE



New update to the guidelines on testing predictive biomarkers in non-small-cell lung cancer: a National Consensus of the Spanish Society of Pathology and the Spanish Society of Medical Oncology

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Non-small cell lung cancer (NSCLC) is a group of tumours with the greatest number of identified therapeutic targets, some of which have clinical utility [from the earliest stages](#)



Table 1 Essential biomarkers in NSCLC patients

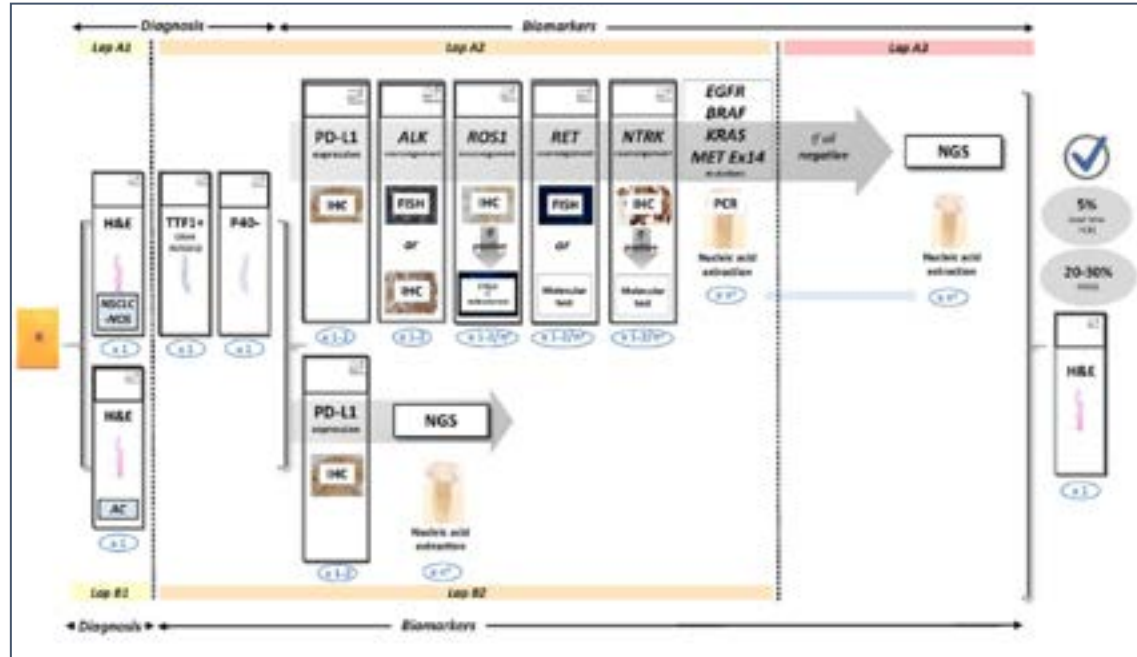
Gene/protein	Predictive alteration	Methodology
<i>EGFR</i>	Mutation	PCR: Sanger sequencing, real-time PCR and NGS
<i>ALK</i>	Rearrangement	IHC, FISH, real-time PCR and NGS
<i>ROS1</i>	Rearrangement	IHC (screening), FISH, real-time PCR and NGS
<i>BRAF V600</i>	Mutation	Real-time PCR and NGS
PD-L1	Overexpression	IHC
<i>NTRK</i>	Rearrangement	IHC (screening), real-time PCR and NGS
<i>RET</i>	Rearrangement	FISH, real-time PCR and NGS
<i>KRAS</i>	Mutation	PCR: Sanger sequencing, real-time PCR and NGS
<i>MET</i>	Mutation	NGS
	Amplification	FISH, real-time PCR and NGS

ALK anaplastic lymphoma kinase, *BRAF* B-Raf proto-oncogene, *EGFR* epidermal growth factor receptor, *FISH* fluorescence in situ hybridisation, *IHC* immunohistochemistry, *KRAS* Kirsten rat sarcoma virus, *MET* mesenchymal epithelial transition factor, *NGS* next-generation sequencing, *NSCLC* non-small cell lung cancer, *NTRK* neurotrophic tyrosine receptor kinase, *PCR* polymerase chain reaction, *PD-L1* programmed death ligand-1, *RET* rearranged during transfection, *ROS1* c-ros oncogene 1

Table 2 Other biomarkers of interest in NSCLC patients

Gene/protein	Predictive alteration	Methodology
<i>HER2</i>	Mutation	NGS
	Amplification	FISH, real-time PCR, NGS
TMB	Mutations	NGS
<i>STK11</i>	Mutation	NGS
<i>KEAP1</i>	Mutation	NGS
MSI	Pattern of hypermutation	IHC, PCR, NGS

FISH fluorescence in situ hybridisation, *HER2* human epidermal growth factor receptor 2, *IHC* immunohistochemistry, *KEAP1* Kelch-like ECH-associated protein 1, *MSI* microsatellite instability-high, *NGS* next-generation sequencing, *NSCLC* non-small cell lung cancer, *PCR* polymerase chain reaction, *STK11* serine/threonine kinase 11, *TMB* tumour mutation burden



Salamat
Спасибо
谢谢
Eskerrik asko
Dзякуй
Gracias
Asante
Merci
Kiitos
ارک ش
Thank
You
Dankie
brigade
Grazie
ขอบคุณคุณ
dziękuje
הדוּת
ありがとう
köszönöm
Tak

