Year in Review: Nontargeted Approaches for Lung Cancer

A CME/MOC-Accredited Live Webinar

Tuesday, June 24, 2025 5:00 PM – 6:00 PM ET

Faculty Benjamin Levy, MD



Faculty



Benjamin Levy, MD

Associate Professor, Johns Hopkins School of Medicine Clinical Director Medical Director, Thoracic Oncology Program Johns Hopkins Sidney Kimmel Cancer Center at Sibley Memorial Washington, DC



MODERATOR Neil Love, MD Research To Practice Miami, Florida



Commercial Support

This activity is supported by educational grants from AstraZeneca Pharmaceuticals LP and Genmab US Inc.



Dr Love — Disclosures

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Planners, scientific staff and independent reviewers for Research To Practice have no relevant conflicts of interest to disclose.



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Immunotherapy and Nontargeted Approaches for NSCLC — Fourth Annual National General Medical Oncology Summit



DR RAMASWAMY GOVINDAN WASHINGTON UNIVERSITY SCHOOL OF MEDICINE



DR STEPHEN V LIU GEORGETOWN UNIVERSITY HOSPITAL









Dr Ramaswamy Govindan and Dr Step Immunotherapy and Nontargeted Appr

(30)

(15)

Optimizing the Selection of First-Line Therapy for Patients with Multiple Myeloma

A CME/MOC-Accredited Live Webinar

Tuesday, July 1, 2025 5:00 PM – 6:00 PM ET

Faculty Xavier Leleu, MD, PhD Peter Voorhees, MD



Practical Perspectives: Experts Review Actual Cases of Patients with Small Cell Lung Cancer

A CME/MOC-Accredited Live Webinar

Wednesday, July 16, 2025 5:00 PM – 6:00 PM ET

Faculty Stephen V Liu, MD Charles Rudin, MD, PhD



Cancer Q&A: Addressing Common Questions Posed by Patients with Relapsed/Refractory Multiple Myeloma

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Patients

Wednesday, July 23, 2025 6:00 PM – 7:00 PM ET

Clinicians

Thursday, August 7, 2025 5:00 PM – 6:00 PM ET

Faculty

Natalie S Callander, MD Sagar Lonial, MD, FACP



Year in Review: Nontargeted Approaches for Lung Cancer

INTRODUCTION: The Boards

MODULE 1: Immune Checkpoint Inhibition for Localized Non-Small Cell Lung Cancer (NSCLC)

MODULE 2: Immunotherapy for Metastatic NSCLC

MODULE 3: Antibody-Drug Conjugates

MODULE 4: Novel Bispecific Antibodies

MODULE 5: Journal Club with Dr Levy



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Dr Ramaswamy Govindan and Dr Step Immunotherapy and Nontargeted Appr

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Immunotherapy and Other Nontargeted Approaches for Lung Cancer

Benjamin Levy, MD

Associate Professor, Johns Hopkins School of Medicine Clinical Director Medical Director, Thoracic Oncology Program Johns Hopkins Sidney Kimmel Cancer Center at Sibley Memorial Washington, DC



Key Datasets

Benjamin Levy, MD

- Forde PM et al. Overall survival with neoadjuvant nivolumab (NIVO) + chemotherapy (chemo) in patients with resectable NSCLC in CheckMate 816. ASCO 2025; Abstract LBA8000.
- Heymach JV et al. **Perioperative durvalumab** for resectable NSCLC (R-NSCLC): **Updated outcomes** from the Phase 3 **AEGEAN** trial. WCLC 2024;Abstract OA13.03.
- Spicer JD et al. Neoadjuvant pembrolizumab plus chemotherapy followed by adjuvant pembrolizumab compared with neoadjuvant chemotherapy alone in patients with early-stage non-small-cell lung cancer (KEYNOTE-671): A randomised, double-blind, placebo-controlled, phase 3 trial. Lancet 2024;404(10459):1240-52.
- Provencio M et al. Perioperative nivolumab (NIVO) vs placebo (PBO) in patients (pts) with resectable NSCLC:
 Updated survival and biomarker analyses from CheckMate 77T. ASCO 2025; Abstract LBA8010.
- Filippi AR et al. Real-world 5-year survival outcomes with durvalumab (D) after chemoradiotherapy (CRT) in unresectable, stage III NSCLC (urNSCLC): Final data extraction from PACIFIC-R. ELCC 2025; Abstract 190P.
- Reck M et al. Five-year outcomes with first-line nivolumab plus ipilimumab with 2 cycles of chemotherapy versus 4 cycles of chemotherapy alone in patients with metastatic non-small cell lung cancer in the randomized CheckMate 9LA trial. *Eur J Cancer* 2024;211:114296.
- Peters S et al. Durvalumab with or without tremelimumab in combination with chemotherapy in first-line metastatic NSCLC: Five-year overall survival outcomes from the phase 3 POSEIDON trial. J Thorac Oncol 2025;20(1):76-93.

Key Datasets

Benjamin Levy, MD (continued)

- Garassino MC et al. Normalized membrane ratio of TROP2 by quantitative continuous scoring is predictive of clinical outcomes in TROPION-Lung 01. WCLC 2024; Abstract PL02.11.
- Levy BP et al. TROPION-Lung02: Datopotamab deruxtecan (Dato-DXd) plus pembrolizumab (pembro) with or without platinum chemotherapy (Pt-CT) as first-line (1L) therapy for advanced non-small cell lung cancer (aNSCLC). ASCO 2025;Abstract 8501.
- Xiong A et al. Ivonescimab versus pembrolizumab for PD-L1-positive non-small cell lung cancer (HARMONi-2): A randomised, double-blind, phase 3 study in China. *Lancet* 2025;405(10481):839-49.
- Aerts J et al. Acasunlimab (DuoBody-PD-L1x4-1BB) alone or in combination with pembrolizumab (pembro) in patients (pts) with previously treated metastatic non-small cell lung cancer (mNSCLC): Initial results of a randomized, open-label, phase 2 trial. ASCO 2024; Abstract 2533.
- Paz-Ares L et al. ABBIL1TY NSCLC-06: A global, randomized, open-label, phase III trial of acasunlimab in combination with pembrolizumab (pembro) vs docetaxel in checkpoint inhibitor (CPI)-experienced patients with PD-L1+ metastatic non-small cell lung cancer (mNSCLC). ELCC 2025;Abstract 128TiP.
- Mamdani H. **Bispecific antibodies in action**: Engineering immunity to target thoracic malignancies. ASCO 2025 Clinical Science Symposium.



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Superior vena cava syndrome



Metastatic NSCLC with no actionable mutation and a PD-L1 TPS (tumor proportion score) between 1% and 50%


Metastatic NSCLC with an activating EGFR mutation and brain metastases



FDA Grants Accelerated Approval to Datopotamab Deruxtecan-dlnk for EGFR-Mutated NSCLC Press Release: June 23, 2025

"On June 23, 2025, the Food and Drug Administration granted accelerated approval to datopotamab deruxtecan-dlnk for adults with locally advanced or metastatic epidermal growth factor receptor (EGFR)mutated non-small cell lung cancer (NSCLC) who have received prior EGFR-directed therapy and platinumbased chemotherapy.

Efficacy was evaluated in a pooled subgroup of 114 patients with locally advanced or metastatic EGFRmutated NSCLC who had received prior treatment with an EGFR-directed therapy and platinum-based chemotherapy and received datopotamab deruxtecan-dlnk at the recommended dose across two clinical trials: TROPION-Lung05 and TROPION-Lung01. TROPION-Lung05 (NCT04484142) was a multicenter, singlearm trial, while TROPION-Lung01 (NCT04656652) was a multicenter, open-label, randomized controlled trial.

The recommended datopotamab deruxtecan-dlnk dose is 6 mg/kg (up to a maximum of 540 mg for patients ≥ 90 kg), as an intravenous infusion once every 3 weeks, until disease progression or unacceptable toxicity."

https://www.fda.gov/drugs/resources-information-approved-drugs/fda-grants-accelerated-approval-datopotamabderuxtecan-dlnk-egfr-mutated-non-small-cell-lung-cancer



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CheckMate 816 study designa



Database lock: January 23, 2025. From *The New England Journal of Medicine*, Forde PM, et al, Neoadjuvant nivolumab plus chemotherapy in resectable lung cancer, 2022;386:1973-1985. Copyright © 2022 Massachusetts Medical Society. Adapted with permission from Massachusetts Medical Society. aNCT02998528. bDetermined by the PD-L1 IHC 28-8 pharmDx assay (Dako). cIncluded patients with PD-L1 expression status not evaluable and indeterminate. dNonsquamous: pemetrexed + cisplatin or paclitaxel + carboplatin; squamous: gemcitabine + cisplatin or paclitaxel + carboplatin. eVinorelbine + cisplatin, docetaxel + cisplatin, gemcitabine + cisplatin (squamous only), pemetrexed + cisplatin (nonsquamous only), or paclitaxel + carboplatin.

Final analysis: OS with neoadjuvant NIVO + chemo vs chemo



Minimum/median follow-up: 59.9/68.4 months. a·d95% CI: aNR; b47.3-NR; c58-72; d47-62.

Lung cancer-specific survival^a



Minimum/median follow-up: 59.9/68.4 months.

alncluded deaths due to disease per investigator assessment (n = 44 in the NIVO + chemo arm; n = 61 in the chemo arm). b-e95% CI: bNR; c73.7-NR; d68-81; e57-72.

AEGEAN: A phase 3, global, randomized, double-blind, placebo-controlled study



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Endpoints: All efficacy analyses performed on a modified population that excludes patients with documented EGFR/ALK aberrations[¶]

Primary:

- pCR by central lab (per IASLC 2020¹)
- EFS using BICR (per RECIST v1.1)

Key secondary:

- MPR by central lab (per IASLC 2020¹)
- DFS using BICR (per RECIST v1.1)
- OS

*The protocol was amended while enrollment was ongoing to exclude (1) patients with tumors classified as T4 for any reason other than size; (2) patients with planned preumonectomies; and (3) patients with documented *EGFR/ALK* aberrations. †Ventana SP263 immunohistochemistry assay. ‡Choice of CT regimen determined by histology and at the investigator's discretion. For non-squamous: cisplatin + pemetrexed or carboplatin + pemetrexed. For squamous: carboplatin + paclitaxel or cisplatin + gemcitabine (or carboplatin + gemcitabine for patients who have comorbidities or who are unable to tolerate cisplatin per the investigator's judgment). [§]Post-operative radiotherapy (PORT) was permitted where indicated per local guidance. [¶]All efficacy analyses reported in this presentation were performed on the mITT population, which includes all randomized patients who did not have documented *EGFR/ALK* aberrations. AJCC, American Joint Committee on Cancer, BICR, blinded independent central review; DFS, disease-free survival; EFS, event-free survival; mITT, modified intent-to-treat; MPR, major pathologic response; pCR, pathologic complete response.

¹Travis WD, et al. J Thorac Oncol 2020;15:709-40.

AEGEAN: Pathologic response per IASLC 2020 methodology* (mITT) *Final analysis*



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Heymach AACR 2023; Abstract CT005

*Using IASLC recommendations for pathologic assessment of response to therapy, including gross assessment and processing of tumor bed (Travis WD, et al. *J Thorac Oncol* 2020;15:709-40). pCR = a lack of any viable tumor cells after complete evaluation of the resected lung cancer specimen and all sampled regional lymph nodes. MPR = less than or equal to 10% viable tumor cells in lung primary tumor after complete evaluation of the resected lung cancer specimen. To be eligible for pathologic assessment, patients needed tohave received three cycles of necadjuvant study Tx per protocol. Patients who were not evaluable were classified as non-responders. [†]CIs calculated by stratified Miettinen and Nurminen method. [‡]No formal statistical testing was performed at the pCR final analysis (DCO: Nov 10, 2022; n=740 [data shown]). Statistical significance was achieved at the interim pCR analysis (DCO: Jan 14, 2022; n=402; *P*-value for pCR/MPR calculated using a stratified Cochran-Mantel-Haenszel test with a significance boundary = 0.000082 calculated using a Lan-DeMets alpha spending function with O'Brien Fleming boundary).

AEGEAN: Updated Event Free Survival

Updated EFS (second planned interim analysis; mITT)

• EFS benefit favoring the durvalumab arm was maintained and consistent with that reported previously¹



Heymach JV et al. Perioperative Durvalumab for Resectable NSCLC (R-NSCLC): Updated Outcomes from the Phase 3 AEGEAN Trial WCLC 2024; Abstract OA13.03.

AEGEAN: Updated Overall Survival

Lung cancer-specific survival (exploratory analysis; mITT)

• Improvement in lung cancer-specific survival also favored the durvalumab arm



John V. Heymach | Perioperative Durvalumab for Resectable NSCLC: Updated Outcomes from the Phase 3 AEGEAN Trial

KEYNOTE-671 Study Design Randomized, Double-Blind, Phase 3 Trial



Key secondary end points: mPR and pCR per blinded, independent pathology review, and safety

^a Assessed at a central laboratory using PD-L1 IHC 22C3 pharmDx. ^b Cisplatin 75 mg/m² IV Q3W + gemcitabine 1000 mg/m² IV on days 1 and 8 Q3W was permitted for squamous histology only. ^c Cisplatin 75 mg/m² IV Q3W + pemetrexed 500 mg/m² IV Q3W was permitted for nonsquamous histology only. ^d Radiotherapy was to be administered to participants with microscopic positive margins, gross residual disease, or extracapsular nodal extension following surgery and to participants who did not undergo planned surgery for any reason other than local progression or metastatic disease. ClinicalTrials.gov identifier: NCT03425643.



Histology (squamous vs nonsquamous)

Geographic region (east Asia vs not east Asia)

PD-L1 TPS^a (<50% vs ≥50%)



KEYNOTE-671

Pathological Response Assessed per Blinded, Independent Pathologist Review



^a Per IASLC criteria, defined as ≤10% viable tumor cells in resected primary tumor and lymph nodes. ^b Per IASLC criteria, defined as absence of residual invasive cancer in resected primary tumor and lymph nodes (ypT0/Tis ypN0). Data cutoff date for IA1: July 29, 2022.





KEYNOTE-671: Updated Overall Survival

Event Free Survival

Overall Survival



Spicer JD et al. Neoadjuvant pembrolizumab plus chemotherapy followed by adjuvant pembrolizumab compared with neoadjuvant chemotherapy alone in patients with early-stage non-small-cell lung cancer (KEYNOTE-671): A randomised, double-blind, placebo-controlled, phase 3 trial. Lancet 2024;404(10459):1240-52

CHECKMATE-77T



OS and lung cancer-specific survival



Median follow-up (range): 41.0 months (31.3-59.8).

67 (29%) patients in the NIVO arm and 101 (44%) patients in the PBO arm received subsequent therapy of any type; 50 (22%) and 87 (38%) patients, respectively, received subsequent systemic therapy. ^aHR (95% CI), 0.85 (0.61-1.18). Significance boundary for OS was not met at this interim analysis. ^{b,c}95% CI: ^b72-83; ^c66-78. ^dExploratory analysis; events were deaths with noted reason of "disease" per investigator assessment. ^{e,f}95% CI: ^e82-91; ^f69-81. **Provencio ASCO 2025;Abstract LBA8010**

Review Article

Perioperative Immunotherapy for Non-Small Cell Lung Cancer: Practical Application of Emerging Data and New Challenges

Angelica D'Aiello,¹ Brendon Stiles,² Nitin Ohri,³ Benjamin Levy,⁴ Perry Cohen,⁵ Balazs Halmos¹

Clin Lung Cancer 2024;25(3):197-214.



Neoadjuvant and Adjuvant Advantages and Disadvantages

Neoadjuvant Chemoimmunotherapy

ADVANTAGES

Eliminate micrometastatic disease
Immune priming
Improved resectability
Early assessment of tumor response
Higher adherence

DISADVANTAGES

Risk of disease progression
Risk of failure to proceed to surgery
Longer time to resection

Adjuvant Chemoimmunotherapy

ADVANTAGES

No delay in proceeding with surgery
Eradicate minimal residual disease
Full pathological information available

DISADVANTAGES

Longer duration of systemic therapy
Lower adherence



D'Aiello A et al. Clin Lung Cancer 2024;25(3):197-214.

Neoadjuvant Biology





D'Aiello A et al. Clin Lung Cancer 2024;25(3):197-214.

Practical Implementation and Patient Navigation for Perioperative Immunotherapy in NSCLC





D'Aiello A et al. Clin Lung Cancer 2024;25(3):197-214.

Epidemiology

RMD Open

Rheumatic & Musculoskeletal Diseases

ORIGINAL RESEARCH

Improved lung cancer clinical outcomes in patients with autoimmune rheumatic diseases

Paola Ghanem,¹ Joseph C Murray,¹ Kristen A Marrone,¹ Susan C Scott,¹ Josephine L Feliciano,¹ Vincent K Lam,¹ Christine L Hann,¹ David S Ettinger,¹ Benjamin P Levy,¹ Patrick M Forde,¹ Ami A Shah,² Christopher Mecoli,² Julie Brahmer,¹ Laura C Cappelli ¹

2023;9(4):e003471.



Flow Diagram of Cohort Selection





Ghanem P et al. RMD Open 2023;9(4):e003471.

Distribution of Autoimmune Diseases





Ghanem P et al. RMD Open 2023;9(4):e003471.

Article

Nature 2024;635(8038):462-71.

CTLA4 blockade abrogates *KEAP1/STK11*related resistance to PD-(L)1 inhibitors

https://doi.org/10.1038/s41586-024-07943-7

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Ferdinandos Skoulidis^{1,53}, Haniel A. Araujo^{1,52}, Minh Truong Do^{1,52}, Yu Qian¹, Xin Sun¹, Ana Galan Cobo¹, John T. Le¹, Meagan Montesion², Rachael Palmer³, Nadine Jahchan³, Joseph M. Juan⁴, Chengvin Min⁵, Yi Yu⁵, Xuewen Pan⁵, Kathryn C. Arbour⁶, Natalie Vokes¹, Stephanie T. Schmidt⁷, David Molkentine¹, Dwight H. Owen⁶, Regan Memmott⁶, Pradnya D. Patil⁹, Melina E. Marmarelis¹⁰, Mark M. Awad¹¹, Joseph C. Murray¹², Jessica A. Hellver¹³, Justin F. Gainor¹⁴, Anastasios Dimou¹⁵, Christine M. Bestvina¹⁶, Catherine A. Shu¹⁷, Jonathan W. Riess¹⁸, Collin M. Blakely¹⁹, Chad V. Pecot²⁰, Laura Mezquita²¹, Fabrizio Tabbó²², Matthias Scheffler²³, Subba Digumarthy²⁴, Meghan J. Mooradian¹⁴, Adrian G. Sacher²⁵, Sally C. M. Lau²⁶, Andreas N. Saltos²⁷, Julia Rotow¹¹, Rocio Perez Johnson²⁶, Corinne Liu²⁸, Tyler Stewart²⁹, Sarah B, Goldberg³⁰, Jonathan Killam³¹, Zenta Walther³², Kurt Schalper³², Kurtis D. Davies³³, Mark G. Woodcock²⁰, Valsamo Anagnostou¹², Kristen A. Marrone¹², Patrick M. Forde¹², Biagio Ricciuti", Deepti Venkatraman", Eliezer M. Van Allen", Amy L. Cummings³⁴, Jonathan W. Goldman³⁴, Hiram Shaish¹⁷, Melanie Kier³⁵, Sharyn Katz¹⁰, Charu Aggarwal¹⁰, Ying Ni⁹, Joseph T. Azok⁹, Jeremy Segal³⁶, Lauren Ritterhouse², Joel W. Neal¹³, Ludovic Lacroix³⁷, Yasir Y. Elamin¹, Marcelo V. Negrao¹, Xiuning Le¹, Vincent K. Lam¹², Whitney E. Lewis¹, Haley N. Kemp¹, Brett Carter³⁰, Jack A. Roth³⁰, Stephen Swisher³⁰, Richard Lee¹, Teng Zhou¹, Alissa Poteete¹, Yifan Kong¹, Tomohiro Takehara¹, Alvaro Guimaraes Paula¹, Edwin R. Parra Cuentas⁴⁰, Carmen Behrens⁴⁰, Ignacio I. Wistuba⁴⁰, Jianjun Zhang¹, George R. Blumenschein¹, Carl Gay¹, Lauren A. Byers¹, Don L. Gibbons¹, Anne Tsao¹, J. Jack Lee⁴¹, Trever G. Bivona¹⁹, D. Ross Camidge⁴², Jhannelle E. Gray²⁷, Natasha B. Leighl²⁵, Benjamin Levy¹², Julie R. Brahmer¹², Marina C. Garassino¹⁶, David R. Gandara¹⁶, Edward B. Garon³⁴, Naiyer A. Rizvi⁴³, Giorgio Vittorio Scagliotti⁴⁴, Jürgen Wolf²³, David Planchard³⁷, Benjamin Besse³⁷, Roy S. Herbst³⁰, Heather A. Wakelee¹³, Nathan A. Pennell⁹, Alice T. Shaw⁴⁵, Pasi A. Jänne¹¹, David P. Carbone⁶, Matthew D. Hellmann⁴⁶, Charles M. Rudin⁶, Lee Albacker², Helen Mann⁴⁷, Zhou Zhu⁴⁷, Zhongwu Lai⁴⁷, Ross Stewart⁴⁷, Solange Peters⁴⁸, Melissa L. Johnson⁴⁹, Kwok K. Wong⁵⁰, Alan Huang⁵, Monte M. Winslow⁴³³, Michael J. Rosen⁴, Ian P. Winters⁴, Vassiliki A. Papadimitrakopoulou⁵¹, Tina Cascone¹, Philip Jewsbury⁴⁷ & John V. Heymach¹⁵³



PACIFIC: 5 YEAR OUTCOMES



Spigel et al. JCO 2022

Poster 190P

Real-world 5-year survival outcomes with durvalumab after chemoradiotherapy in unresectable, stage III NSCLC: final data extraction from PACIFIC-R

Figure 1. PACIFIC-R (NCT03798535), an observational, retrospective chart review study



Table 1. OS, rwPFS, and TTDM in the FAS										
Category		N=1153								
OS	Median (95% CI), months	59.0 (52.7–64.3)								
	5-year rate (95% C I), %	49.2 (46.2–52.2)								
rwPFS	Median (95% CI), months	24.3 (20.3–28.4)								
	5-year rate (95% CI), %	35.2 (32.4–38.1)								
TTDM	Median (95% CI), months	37.2 (33.3–43.0)								
	5-year rate (95% C I), %	40.2 (37.3–43.2)								
		,								

PACIFIC-RW OUTCOMES



QUESTIONS?



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CheckMate 9LA study designa

Key Eligibility Criteria

- Stage IV or recurrent NSCLC
- No prior systemic therapy
- No sensitizing *EGFR* mutations or known *ALK* alterations
- ECOG PS 0-1

Stratified by PD-L1^b (< 1%^c vs ≥ 1%), sex, and histology (SQ vs NSQ)





Interim database lock: October 3, 2019; minimum follow-up: 8.1 months for OS and 6.5 months for all other endpoints. Updated database lock: March 9, 2020; minimum follow-up: 12.7 months for OS and 12.2 months for all other endpoints. aNCT03215706; bDetermined by the PD-L1 IHC 28-8 pharmDx assay (Dako); cPatients unevaluable for PD-L1 were stratified to PD-L1 < 1% and capped to 10% of all randomized patients; dNSQ: pemetrexed + cisplatin or carboplatin; SQ: paclitaxel + carboplatin; eHierarchically statistically tested. Book ASCO 2024; Abc

Reck ASCO 2024; Abstract 8560

CheckMate 9LA: IIT UPDATED OS



CheckMate 9LA: UPDATED OS





Reck Eur J Cancer 2024

POSEIDON STUDY DESIGN



POSEIDON: UPDATED OS

January 2025

Durable mNSCLC OS With T+D+CT After >5 years



Peters J Thorac Oncol 2025

POSEIDON: UPDATED OS

	mour		Te	DACT			D+C			0	-	В	Sauce				Te	DACT			Dect	r				
Nonsquamous			10	7/014			170/0/	20					Squame	lustia	4	(14	2/104			447/40	10		117/1		
Events/pa	atients, n/N		16	7/214			172/20	19		186/2	214		Events/	patien	ts, n/N		11.	2/124			117/12	28		117/1	22	
mOS, mo	nths (95% C	1) 1	7.2 (1	4.9-2	1.8)	14.8	(11.8-	-18.3)	13.	0 (10.	6–15.1)		mOS, n	nonths	(95%)	CI)	10.4 (8	3.4–12	2.7)	11.5	5 (9.4-	-14.0)	10	.5 (8.0	-11.7)	
HR (95%	CI) vs CT	0	.69 (0	.56–0	.85)	0.81	(0.66-	-1.00)		-			HR (95%	% CI) v	s CT		0.85 (0	.65–1	.10)	0.82	(0.64-	-1.07)		-		
Landmar	k OS, % (95%	% CI)											Landma	ark OS	, % (95	5% CI)										
24 mor	nths	4	1.3 (3	4.6-4	7.9)	35.4	(28.9-	-42.0)	26.	5 (20.	6–32.7)		24 m	onths			18.1 (1	1.8-2	5.4)	20.3	(13.8	-27.8)	14	.1 (8.6	–20.9)	
36 mor	36 months			31.2 (25.1-37.6)			25.0 (19.3-31.1)			16.9 (12.1-22.4)			36 months				14.0 (8.5-20.7)			13.6 (8.2-20.2)				7.4 (3.7–13.0)		
48 mor	48 months			25.5 (19.8-31.5)				-24.1)	10.	.2 (6.5	5–14.9)		48 months				13.1 (7.8–19.7)			10.2 (5.6-16.3)				5.8 (2.6-10.9)		
60 mor	60 months		0.5 (1	5.3-2	6.2)	16.4 (11.6-21.8)				9.1 (5.6-13.6)			60 months				7.3 (3	.1)	7.6 (3.8-13.2)				2.9 (0.8-7.3)			
Lopapilith of 0.4 - 0.2 - 0.0 0	6 12	-18	24	- + - 30	44-4-------------	42	+ - - -	54	60	••••••• •••••••	►₩₩ ₩ ₩ 72	Probability of (0.6 - 0.4 - 0.2 - 0.0 - 0.0 - 0	6	12	18	24	- 30	36	42	48		60	66	++ 72	
Time from randomization (months)									No. at	risk			Time from randomization (months)													
T+D+CT 214	169 129	102	86	71	65	57	52	45	40	17	3	Т	+D+CT 124	4 87	54	34	22	17	16	14	14	11	7	4	0	
D+CT 209	152 116	90	72	59	50	41	36	34	31	14	2		D+CT 128	3 95	60	35	24	21	16	14	12	11	9	4	1	
	454 440	70	5.2	37	33	23	10	18	17	8	2		CT 122	0 00	40	32	17	13	9	8	6	3	3	2	0	

Original Study

Clinical and Genomic Characterization of Long-Term Responders Receiving Immune Checkpoint Blockade for Metastatic Non–Small-Cell Lung Cancer

Paola Ghanem,¹ Joseph C. Murray,² Melinda Hsu,³ Matthew Z. Guo,¹ David S. Ettinger,² Josephine Feliciano,² Patrick Forde,² Christine L. Hann,² Vincent K. Lam,² Benjamin Levy,² Valsamo Anagnostou,² Julie R. Brahmer,² Kristen A. Marrone²

Clin Lung Cancer 2024;25(2):109-18.



Determinants of Clinical Benefit with Immune Checkpoint Blockade





Ghanem P et al. *Clin Lung Cancer* 2024;25(2):109-18.
Genomic Features by Cohort





Ghanem P et al. *Clin Lung Cancer* 2024;25(2):109-18.

QUESTIONS?



Year in Review: Nontargeted Approaches for Lung Cancer

INTRODUCTION: The Boards

MODULE 1: Immune Checkpoint Inhibition for Localized Non-Small Cell Lung Cancer (NSCLC)

MODULE 2: Immunotherapy for Metastatic NSCLC

MODULE 3: Antibody-Drug Conjugates

MODULE 4: Novel Bispecific Antibodies

MODULE 5: Journal Club with Dr Levy



Antibody-Drug Conjugates in Advanced Lung Cancer: Is This a New Frontier?

Joshua E. Reuss, MD¹; Samuel Rosner, MD²; and Benjamin P. Levy, MD³

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³Johns Hopkins Sidney Kimmel Cancer Center at Sibley Memorial Hospital, Washington, DC

Clin Adv Hematol Oncol 2024;22(5):217-26.



LUNG CANCER

Antibody-Drug Conjugates for Lung Cancer: Payloads and Progress

Samuel Rosner, MD¹; Augusto Valdivia, MD²; Hui Jing Hoe, MBBS³; Joseph C. Murray, MD¹; Benjamin Levy, MD¹; Enriqueta Felip, MD²; and Benjamin J. Solomon, MBBS, PhD³

Am Soc Clin Oncol Educ Book 2023;43:e389968.



Datopotamab Deruxtecan vs Docetaxel in NSCLC TROPION-Lung01: Study Design



• Histology (actionable genomic alteration)

1 anti–PD-(L)1 mAb

• Anti-PD-(L)1 mAb included in most recent prior therapy, geography

Datopotamab Deruxtecan vs Docetaxel in NSCLC TROPION-Lung01: Primary Endpoints

Dual primary endpoints: PFS endpoint met, but OS endpoint not met

		Dato-DXd (n = 299)	Docetaxel (n = 305)
	No. of events/No. of patients	213/299	218/305
	Median PFS, months	4.4	3.7
100	(95% CI)	(4.2-5.6)	(2.9-4.2)
80 🗕 📐	HR (95% CI)	0.75 (0	.62-0.91)
	P value	0.	004
	Docetaxel Dato-D> 6 8 10 12 14 16 Months	I 8	
		Dato-DXd $(n = 299)$	Docetaxel $(n = 305)$
	No of events/No of patients	215/299	218/305
	Median OS months	12.9	11.8
100	(95% CI)	(11.0-13.9)	(10.0-12.8)
80 -	HR (95% CI)	0.94 (0.7	8-1.14)
₢ 60 -	P value	0.5	30
8 40 - 20 -	Docetaxel	d	
0 2 4 6 8	10 12 14 16 18 20 22 24 26 28 30	32 34	
	Months		

	Datopotamab deruxtecan	Docetaxel
ORR	26.4%	12.8%
mDOR	7.1 mos	5.6 mos
mPFS	4.4 mos	3.7 mos
mOS	12.9 mos	11.8 mos

TROP2 Normalized Membrane Ratio (NMR) Measured by Quantitative Continuous Scoring (QCS)

QCS is a novel, fully-supervised computational pathology approach that precisely quantifies and locates targets like TROP2

- TROP2 tumor membrane expression using conventional IHC and pathology visual scoring does not enrich for response
- TROP2 NMR as measured by QCS reflects the expression of TROP2 in the membrane relative to total TROP2 (membrane and cytoplasm)



Overall BEP: Efficacy by TROP2 QCS-NMR Status

TROP2 QCS-NMR positivity is predictive for longer PFS with Dato-DXd in the biomarker-evaluable population



Dr Marina Chiara Garassino | Normalized Membrane Ratio of TROP2 by Quantitative Continuous Scoring is Predictive of Clinical Outcomes in TROPION-Lung01

Data cutoff: March 29 2023 PFS HR (95% CI) by TROP2 QCS-NMR status (+ vs -) within treatment: Dato-DXd: 0.48 [0.33-0.69]; Docetaxel:0.97 [0.68-1.39]

TROPION-Lung02

• Phase 1b study of Dato-DXd + pembrolizumab ± Pt-CT in a/mNSCLC without actionable genomic alterations^a



Data cutoff: April 29, 2024. Median study duration was 18.7 months (range, 11-33.8) for doublet and 24.6 months (range, 15.4-32.4) for triplet combinations.

^aPatients with known actionable genomic alterations in *EGFR*, *ALK*, *ROS1*, *NTRK*, *BRAF*, *RET*, or *MET*, or with alterations in other actionable oncogenic driver kinases were not eligible for this study. ^bThe first 3 to 6 patients in each cohort were enrolled to confirm acceptable safety/DLT rate; the remaining patients are considered part of dose expansion. ^cPrior therapy requirements are for treatment in the a/m setting. ^dEnrollment after June 30, 2022.

1L, first line; a/m, advanced or metastatic; CT, chemotherapy; DLT, dose-limiting toxicity; IV, intravenous; NSCLC, non-small cell lung cancer; Pt-CT, platinum-based chemotherapy; Q3W, every 3 weeks.



#ASCO25 PRESENTED BY: Benjamin P. Levy, MD, FASCO



TROPION-Lung02: Efficacy, 1L Doublet



Data cutoff: April 29, 2024. *1 CR, 22 PR. Pooled data including patients who received Dato-DXd 4mg/kg (5%) and Dato-DXd 6 mg/kg (doublet: 95%) 1L, first line; BOR, best overall response; CI, confidence interval; CR, complete response; DCR, disease control rate; DOR, duration of response; NE, not evaluable; ORR, objective response rate; PR, partial response; TTR, time to response.



#ASCO25



TROPION-Lung02: Efficacy, 1L Triplet



Data cutoff: April 29, 2024. *2 CR, 28 PR. Pooled data including patients who received Dato-DXd 4mg/kg (41%) and Dato-DXd 6 mg/kg (59%)

1L, first line; BOR, best overall response; CI, confidence interval; CR, complete response; DCR, disease control rate; DOR, duration of response; NE, not evaluable; ORR, objective response rate; PR, partial response; TTR, time to response.



#ASCO25



TROPION-Lung02

Efficacy by TROP2 NMR, 1L Biomarker Evaluable Population





Data cutoff: April 29, 2024. Pooled data including patients who received Dato-DXd 4mg/kg and 6 mg/kg BEP, biomarker evaluable population;CI, confidence interval; HR, hazard ratio; mo, months; NE, not evaluable; OS, overall survival; PFS, progression-free survival; TROP2 NMR, TROP2 normalized membrane ratio.



PRESENTED BY: Benjamin P. Levy, MD, FASCO

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QUESTIONS?



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MODULE 5: Journal Club with Dr Levy



The science





Mamdani ASCO 2025; Clinical Science Symposium

KNOWLEDGE CONQUERS CANCER

HARMONI-2 STUDY

Ivonescimab vs Pembrolizumab for PD-L1 positive NSCLC

HARMONi-2 (AK112-303): Study Design



Randomized, double-blind, phase 3 study conducted in China^a (NCT05499390)



Ivonescimab is an investigational therapy not presently approved by any regulatory authority other than China's National Medical Products Administration (NMPA)

HARMONi-2 (AK112-303): Efficacy Data



Primary Endpoint—PFS per IRRC



	Ivonescimab (n = 198)	Pembrolizumab (n = 200)	
Number of Events/Patients	72/198	112/200	
mPFS, mos (95% CI)	11.1 (7.3, NE)	5.8 (5.0, 8.2)	
Stratified HR (95% CI)	0.51 (0.38, 0.69)		
<i>P</i> -value	<0.0001		

Median Duration of Follow-up: 8.7 months (IQR: 7.1, 10.3) Data cut off: January 29, 2024. Interim analysis for PFS was conducted after 184 IRRC-assessed PFS events were observed

Ivonescimab demonstrated a statistically significant improvement in PFS vs. pembrolizumab with HR = 0.51, and a 5.3 months improvement in mPFS

Ivonescimab is an investigational therapy not presently approved by any regulatory authority other than China's National Medical Products Administration (NMPA) Xiong Lancet 2025

HARMONi-2 Safety Summary

TRAEs

Safety Summary, n (%)	Ivonescimab (n = 197ª)	Pembrolizumab (n = 199ª)	
TRAEs (all grades)	177 (89.8)	163 (81.9)	
Grade≥3	58 (29.4)	31 (15.6)	
Serious TRAEs	41 (20.8)	32 (16.1)	
Leading to discontinuation	3 (1.5)	6 (3.0)	
Leading to death	1 (0.5)	2 (1.0)	

Ivonescimab showed a manageable safety profile, which was consistent with previous studies.

TRAEs in SQ Subgroup

Safety Summary, n (%)	Ivonescimab (n = 90ª)	Pembrolizumab (n = 91ª)
TRAEs (all grades)	77 (85.6)	73 (80.2)
Grade≥3	20 (22.2)	17 (18.7)
Serious TRAEs	17 (18.9)	17 (18.7)
Leading to discontinuation	2 (2.2)	3 (3.3)
Leading to death	0	1 (1.1)

Ivonescimab also demonstrated a tolerable safety profile in SQ patients.

The Most Common TRAEs (incidence ≥10%)



The differences in AEs were predominantly proteinuria, hypertension, and laboratory abnormalities.

Mechanisms of action



Dual CPI



Cheng et al., J Hemat Oncol 2024

Other co-targets:

- TIGIT
- LAG3
- TIM3



In Thoracic Malignancies:

Target	Agent		
PD-1 x CTLA-4	Volrustomig		
	Cadonilimab		
	Vudalimab		
	Lorigerlimab		
	Danvilostomig		
	Erfonrilimab		
PD-1 x TIGIT	Rilvegostomig		



Volrustomig

2025 ASCO

ANNUAL MEETING

Volrustomig + chemotherapy as 1L treatment of mNSCLC (Phase Ib)



#ASCO25



Spigel et al., WCLC 2024



PRE SENTED BY: Hirva Mamdani, MD

Volrustomig: Toxicity

Volrustomig + chemotherapy as 1L treatment of mNSCLC (Phase Ib)

	All (N=140)		NSQ Cohort 1A (n=66)		NSQ Cohort 1B (n=54)		SQ Cohort 2 (n=20)	
Median volrustomig exposure (range), months	4.8 (0.3–28.3)		4.8 (0.3–28.3)		4.4 (0.3–18.6)		6.8 (0.7–18.6)	
Any TEAE, n (%)	<mark>139 (</mark>	99.3)	66 (1	00.0)	53 (9	98.1)	20 (1	00.0)
Any TRAE, n (%)	136 (97.1)	65 (9	98.5)	51 (9	94.4)	20 (1	00.0)
Grade 3/4 TRAE	106 (75.7)	50 (7	75.8)	38 (7	70. <u>4</u>)	18 (9	90.0)
TRAE leading to volrustomig discontinuation	42 (3	30.0)	19 (2	28.8)	16 (2	29.6)	7 (3	5.0)
TRAE leading to death*	7 (5	5.0)	6 (9	9.1)	()	1 (5.0)
Select TRAEs (preferred term), n (%)	Any grade	Grade 3/4	Any grade	Grade 3/4	Any grade	Grade 3/4	Any grade	Grade 3/4
Rash	38 (27.1)	4 (2.9)	21 (31.8)	2 (3.0)	10 (18.5)	0	7 (35.0)	2 (10.0)
ALT increased	33 (23.6)	9 (6.4)	13 (19.7)	4 (6.1)	18 (33.3)	5 (9.3)	2 (10.0)	0
AST increased	32 (22.9)	6 (4.3)	13 (19.7)	2 (3.0)	17 (31.5)	4 (7.4)	2 (10.0)	0
Hyperthyroidism	18 (12.9)	0	10 (15.2)	0	6 (11.1)	0	2 (10.0)	0
Pneumonitis	10 (7.1)	4 (2.9)	2 (3.0)	0	4 (7.4)	3 (5.6)	4 (20.0)	1 (5.0)
Diarrhea	15 (10.7)	2 (1.4)	8 (12.1)	1 (1.5)	3 (5.6)	1 (1.9)	4 (20.0)	0

Spigel et al., WCLC 2024





Volrustomig: Ongoing Trials

Trial	Phase	Treatment Line	Regimen
eVOLVE-LUNG02	III	1L	Volrustomig + chemo vs pembrolizumab + chemo; PD-L1 <50%
eVOLVE-MESO	III	1L	Volrustomig + chemo vs investigator's choice SOC (nivo/ipi or chemo)





Rilvegostomig



Rilvegostomig in advanced NSCLC with PD-L1 ≥1%; CPI naïve (Phase II)





Hiltermann et al., WCLC 2024





Rilvegostomig: Toxicity



Hiltermann et al., WCLC 2024



PRE SENTED BY: HIRVA Mamdani, MD



Rilvegostomig: Ongoing Trials

Trial	Phase	Treatment Line	Regimen
ARTEMIDE-Lung02	III	1L	Rilvegostomig vs Pembrolizumab plus Chemotherapy for mNSCLC (squamous)
ARTEMIDE-Lung03	III	1L	Rilvegostomig vs Pembrolizumab plus Chemotherapy for mNSCLC (non-squamous)
ARTEMIDE-Lung 04	III	1L	Rilvegostomig vs Pembrolizumab monotherapy for PD-L1-high mNSCLC
TROPION-Lung 12	III	Adjuvant, Stage I	Dato-DXd + Rilvegostomig or Rilvegostomig monotherapy vs standard of care, following R0 resection in stage I adenocarcinoma of the lung (ctDNA-positive or high-risk pathologic features)
TROPION-Lung 10	III	1L	Dato-DXd + Rilvegostomig or Rilvegostomig monotherapy vs pembrolizumab for mNSCLC (non- squamous) with high PD-L1 expression



#ASCO25



Phase II Study of Acasunlimab with or without Pembrolizumab for Previously Treated Metastatic NSCLC





NCT05117242.

Enrollment was discontinued in the acasunlimab monotherapy group in October 2023 and in the acasunlimab + pembro Q3W group in February 2024; enrollment is ongoing in acasunlimab + pembro Q6W group. ^aPrior to cycle 1 day 1 with PD-L1 expression in ≥1% of tumor cells by a sponsordesignated central laboratory using the Dako PD-L1 IHC 22C3 pharmDx assay or by local assessment. ^bIncluding safety run-in for combination regimen cohorts, up to 40 centrally confirmed PD-L1* patients per arm. ^cRandomization stratified by PD-L1 expression (1–49% vs ≥50% PD-L1* tumor cells) and histology (squamous vs nonsquamous).



Aerts J et al. ASCO 2024; Abstract 2533.

Acasunlimab with or without Pembrolizumab: Efficacy by PD-L1 Status

	Acasunlimab Monotherapy (n=16)	Acasunlimab + Pembro Q3W (n=22)ª	Acasunlimab + Pembro Q6W (n=24) ^b
Unconfirmed ORR, % (95% Cl)	31.3 (11.0–58.7)	20.8 (7.1–42.2)	29.6 (13.8–50.2)
Confirmed ORR, % (95% Cl)	12.5 (1.6–38.3)	18.2 (5.2-40.3)	16.7 (4.7–37.4)
Confirmed DCR, % (95% Cl)	50.0 (24.7–75.3)	59.1 (36.4–79.3)	75.0 (53.3–90.2)
Median DOR, mo (95% CI)	2.0 (1.6-NR)	5.2 (3.5–NR)	NR (NR–NR)
6-month PFS rate, % (95% CI)	0 (NA)	14 (3–31)	34 (13–56)
12-month OS rate, % (95% CI)	30 (9–54)	26 (6–52)	69 (43–85)

Data cutoff: March 22, 2024. Centrally confirmed PD-L1* patients are shown.

an=24 for unconfirmed ORR. bn=27 for unconfirmed ORR.

Anti-Tumor Activity by Treatment Group and Best Overall Response



Kaplan-Meier Plot of OS in Patients With PD-L1⁺ mNSCLC



ORR = objective response rate; DCR = disease control rate; DOR = duration of response; PFS = progression-free survival; OS = overall survival; TPS = tumor proportion score



Aerts J et al. ASCO 2024; Abstract 2533.

Acasunlimab with or without Pembrolizumab: Safety



Data cutoff: March 22, 2024. One grade 5 TRAE (immune-mediated hepatitis) was observed in the acasunlimab + pembro Q3W arm. alncludes alanine aminotransferase increased, aspartate aminotransferase increased, gamma-glutamyltransferase increased, hypertransaminasemia, hepatitis, and immune-mediated hepatitis.

TRAEs = treatment-related adverse events

RTPYear_{in} Review 507

Aerts J et al. ASCO 2024; Abstract 2533.

Ongoing Phase III ABBIL1TY NSCLC-06 Trial Schema



Proposed Mechanism of Action of Acasunlimab in Combination With Anti–PD-1 Immunotherapy



Evaluate acasunlimab in combination with pembro vs docetaxel in patients with PD-L1+ mNSCLC after progression on PD-(L)1-inhibitor and platinum-based chemotherapy





QUESTIONS?



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nature medicine



Article

https://doi.org/10.1038/s41591-023-02598-9

ctDNA response after pembrolizumab in non-small cell lung cancer: phase 2 adaptive trial results

Received: 14 March 2023	Valsamo Anagnostou Q ^{1,2} 🖂, Cheryl Ho ³ , Garth Nicholas ⁴ ,
Accepted: 19 September 2023	— Rosalyn Anne Juergens ^o , Adrian Sacher ^o , Andrea S. Fung ^r , Paul Wheatley-Price [*] , Scott A. Laurie ⁴ , Benjamin Levy ¹ , Julie R. Brahmer ^{1,2} , Archana Balan ¹ ,
Published on line: 9 October 2023	Noushin Niknafs ¹ , Egor Avrutin ⁸ , Liting Zhu ⁸ , Mark Sausen Q ⁹ ,
	Kevue Ding ⁸ & Janet Dancev ⁸

2023;29(10):2559-69.



BR36 Trial Schema



JC JOURNAL CLUB RTPYear in Keyiew

First stage

Anagnostou V et al. Nat Med 2023;29(10):2559-69.

BR36 Consort Flow Diagram





Anagnostou V et al. *Nat Med* 2023;29(10):2559-69.
Overview of Plasma Variants Detected by Next-Generation Sequencing



ctDNA = circulating tumor DNA

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Representative ctDNA Kinetics Patterns





Radiographic Response Assessment, Molecular Response and OS



JOURNAL CLUB RTPYear in Review 8

PFS and OS for Patients with ctDNA Molecular Responses





Depth of ctDNA Response in Association with RECIST Radiographic Response



maxMAF = maximal mutant allele fraction; CR = complete response; PR = partial response; SD = stable disease; PD = progressive disease



CLINICAL CANCER RESEARCH | PRECISION MEDICINE AND IMAGING

Elucidating the Heterogeneity of Immunotherapy Response and Immune-Related Toxicities by Longitudinal ctDNA and Immune Cell Compartment Tracking in Lung Cancer

Joseph C. Murray^{1,2,3}, Lavanya Sivapalan¹, Karlijn Hummelink⁴, Archana Balan¹, James R. White¹, Noushin Niknafs¹, Lamia Rhymee¹, Gavin Pereira¹, Nisha Rao¹, Benny Weksler⁵, Nathan Bahary⁵, Jillian Phallen¹, Alessandro Leal¹, David L. Bartlett⁵, Kristen A. Marrone^{1,3}, Jarushka Naidoo^{1,6}, Akul Goel⁷, Benjamin Levy¹, Samuel Rosner¹, Christine L. Hann¹, Susan C. Scott¹, Josephine Feliciano¹, Vincent K. Lam¹, David S. Ettinger¹, Qing Kay Li^{1,8}, Peter B. Illei^{1,8}, Kim Monkhorst⁴, Robert B. Scharpf¹, Julie R. Brahmer^{1,2,3}, Victor E. Velculescu¹, Ali H. Zaidi⁵, Patrick M. Forde^{1,2}, and Valsamo Anagnostou^{1,2,3}

2024;30(2):389-403.



Overview of Study Methodology



NGS = next-generation sequencing



Course of Disease for Each Patient





Landscape of Variants Detected in Plasma





Longitudinal Cell-Free Tumor Load Dynamics and Molecular Response Classifications



BOR = best overall radiographic response



Association Between ctDNA Maximum Mutant Allele Fraction (max MAF) Dynamics and Molecular Response





Association Between ctDNA Molecular Responses and Radiographic Response Assessments



DCB = durable clinical benefit; NDB = nondurable clinical benefit; mPD = molecular progressive disease; mR = molecular response; mR f/b REC/EM = mR followed by recrudescence/emergence



Association Between Cell-Free Tumor Load (cfTL) Clearance and PFS and OS





Survival Outcomes in the Cohort of Patients with Radiographically Stable Disease





cfTL Clearance and Tumor Responses



SLD = sum of tumor longest diameter; TT = time to



T-Cell Receptor Clonal Dynamics and Clinical Benefit and Development of Immune-Related Adverse Events (irAEs)



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JOURNAL CLUB

T-Cell Receptor (TCR) Clonal Dynamics and Immunotherapy-Related Pneumonitis





Examples of TCR Cluster Dynamics in Patients with Immune-Related Adverse Events





Optimizing the Selection of First-Line Therapy for Patients with Multiple Myeloma

A CME/MOC-Accredited Live Webinar

Tuesday, July 1, 2025 5:00 PM – 6:00 PM ET

Faculty Xavier Leleu, MD, PhD Peter Voorhees, MD

> Moderator Neil Love, MD



Thank you for joining us!

Please take a moment to complete the survey currently up on Zoom. Your feedback is very important to us. The survey will remain open for 5 minutes after the meeting ends.

Information on how to obtain CME, ABIM MOC and ABS credit is provided in the Zoom chat room. Attendees will also receive an email in 1 to 3 business days with these instructions.

