



ASCO HIGHLIGHTS

31 MAYO - 4 JUNIO 2019



Cómo revertir la resistencia a las terapias dirigidas EGFR, ROS1

Dr. Delvys Rodríguez-Abreu

Día 1

Con la colaboración de:

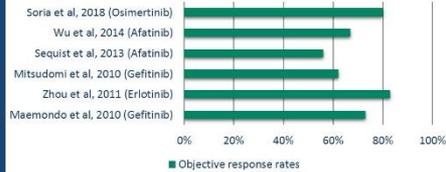


Background: EGFR TKIs

While targeting an oncogenic driver in NSCLC usually leads to robust initial responses, emergence of resistance is inevitable and limits clinical benefit

EGFR mutated NSCLC

OBJECTIVE RESPONSE RATE

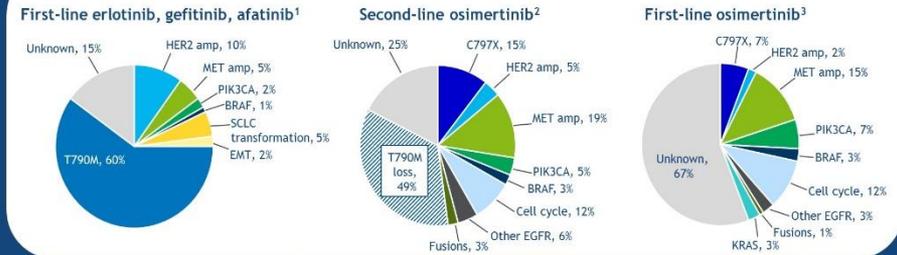


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Targeting HER3 to Address Multiple EGFR TKI Resistance Mechanisms

Mechanisms of resistance to EGFR TKIs in EGFR-mutant NSCLC



- Developing therapies to combat all individual resistance mechanisms is likely impractical
- Resistance mechanisms may overlap in an individual patient
- 57%–67% of EGFR-mutant NSCLCs show some level of HER3 expression^{4,5}

Targeting HER3 with an antibody drug conjugate may be an alternative treatment strategy for advanced NSCLC

1. Wu, et al. Mol Cancer. 2018;17:38. 2. Papadimitrakopoulou, et al. Ann Oncol. 2018;29. 3. Ramalingam, et al. Ann Oncol. 2018;29. 4. Yi, et al. Mod Pathol. 1997;10:142-148. 5. Kawano, et al. J Surg Res. 2008;146:43-46.

EGFR TKI Resistance Creates a Significant Unmet Need in Metastatic EGFR-mutant NSCLC

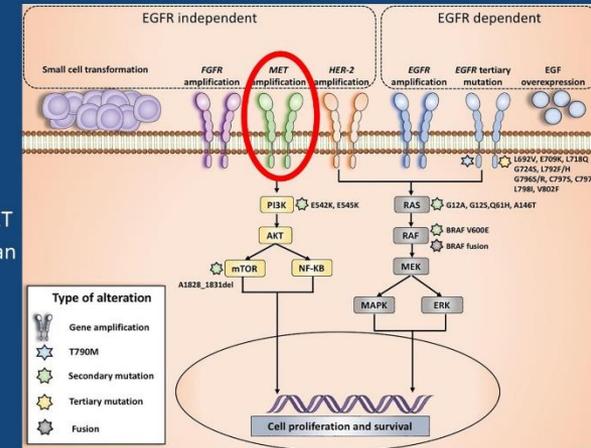


^aEstimates of patients who have progressed on EGFR TKIs and chemotherapy from Tan CS, et al. Mol Cancer. 2018;17:29. References: Planchard D, et al. Ann Oncol. 2018;29:iv192-iv237. Ettinger DS, et al. J Natl Compr Canc Netw. 2017;15:504-535. Jänne PA, et al. Lancet Oncol. 2014;15:1433-1441. EGFR, epidermal growth factor receptor; NSCLC, nonsmall cell lung cancer; TKI, tyrosine kinase inhibitor.

MET amplification

- Post-osimertinib: 15%
- Pre-clinical models show synergy between EGFR and MET inhibition and targeting MET can reverse resistance
- Treatment strategy: dual inhibition

Lim, et al. Cancer Treatment Reviews 2018



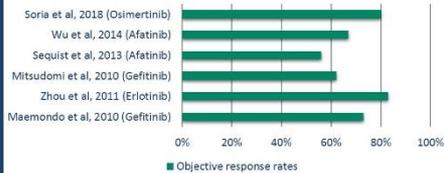
Revertir resistencia a EGFR

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EGFR mutated NSCLC

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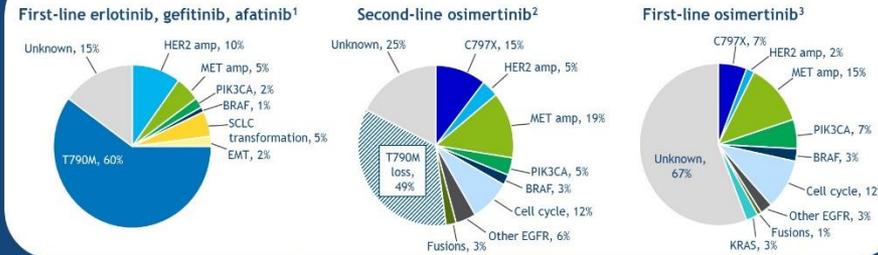


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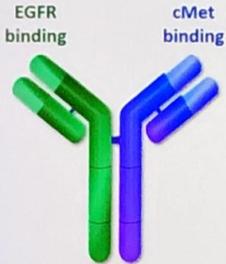
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JNJ-61186372 (JNJ-372), an EGFR-cMet bispecific antibody, in EGFR-driven advanced non-small cell lung cancer (NSCLC)

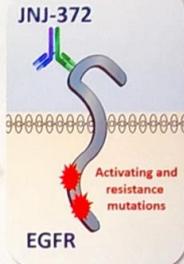
Eric B. Haura,¹ Byoung Chul Cho,² Jong-Seok Lee,³ Ji-Youn Han,⁴ Ki Hyeon Lee,⁵ Rachel E. Sanborn,⁶ Ramaswamy Govindan,⁷ Eun Kyung Cho,⁸ Sang-We Kim,⁹ Karen L. Reckamp,¹⁰ Joshua K. Sabari,¹¹ Catherine A. Shu,¹² Dong-Wan Kim,¹³ Jorge E. Gomez,¹⁴ Aaron S. Mansfield,¹⁵ Alexander Spira,¹⁶ Pasi A. Jänne,¹⁷ Santiago Viteri,¹⁸ Jose Manuel Trigo,¹⁹ Martin Curtis,²⁰ Patricia A. Lorenzini,²⁰ Meena Thayu,²⁰ Amy Roshak,²⁰ Kyoungwha Bae,²⁰ Roland E. Knoblauch,²⁰ Joshua C. Curtin,²⁰ Nahor Haddish-Berhane,²⁰ Matthew V. Lorenzi,²⁰ Keunchil Park,²¹ Joshua M. Baumli²²

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Overview: JNJ-61186372 (JNJ-372)



- Fully humanized, bispecific IgG1 antibody
- Targets EGFR and cMet receptors through unique mechanisms of action
- Potential to provide clinical benefit in EGFR-driven NSCLC, including TKI-resistant populations
- First-in-human study currently evaluating activity in EGFRmut-driven NSCLC



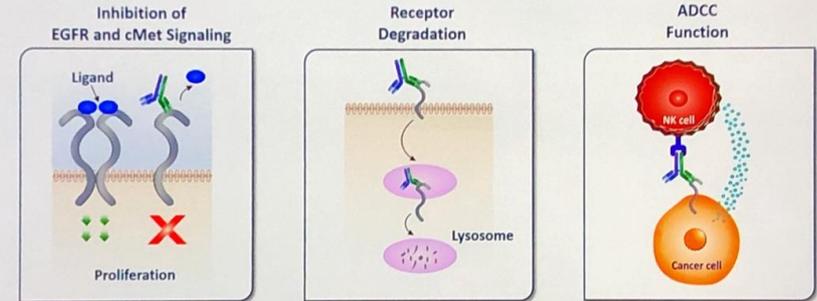
EGFR-epidermal growth factor receptor; EGFRmut-epidermal growth factor receptor mutation; NSCLC-non-small cell lung cancer; TKI-tyrosine kinase inhibitor

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Preclinical Data Consistent With 3 Proposed Mechanisms of Action



JNJ-372 has demonstrated activity in multiple EGFRmut NSCLC models of EGFR- and cMet-mediated TKI resistance

Moore et al. 2016 Cancer Res; 76 (13)

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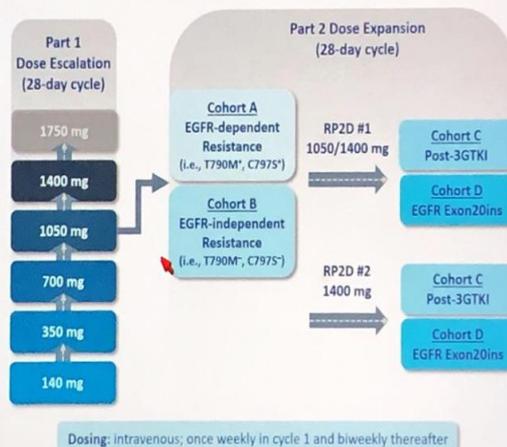
3

Study Design: Objectives and Eligibility

N-142

Dr. Keunchil Park
Samsung Medical Center
Sungkyunkwan University School of Medicine
WCLC 2018
J Thorac Oncol 2018;13:5344-5

Dr. Byoung Chul Cho
Yonsei Cancer Center
Yonsei University College of Medicine
ESMO 2018
Ann Oncol 2018;29:viii493-viii547



Dosing: intravenous; once weekly in cycle 1 and biweekly thereafter

3GTKI-3rd generation tyrosine kinase inhibitor; ECOG PS-Performance Cooperation Oncology Group performance status; Exon20ins-exon 20 insertion; PG-pharmacokinetics; RP2D-recommended phase 2 dose; SOC-standard of care

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Demographic and Baseline Disease Characteristics

	Total (N=142)	Total (N=142)	
Median age, years (range)	63 (33-82)	EGFR mutation subtype, n (%) ^a	
Male/Female, n (%)	52/90 (37/63)	wtEGFR	11 (8)
Race, n (%)		Primary EGFR mutation ^b	131 (92)
Asian	100 (70)	Exon 19 deletion	60 (46)
Black	4 (3)	Exon 21 L858R	34 (26)
White	33 (23)	Exon 20 insertion	33 (25)
Not reported	5 (4)	Exon 18 G719A	3 (2)
ECOG PS, n (%)		Exon 20 S768I	1 (1)
0	37 (26)	Exon 20 T790M	1 (1)
1	104 (73)	V769L	1 (1)
2	1 (1)	TKI resistance mutation ^{b,c}	
Median prior lines of treatment, n (range)	3 (0-10)	T790M	49 (37)
Median prior lines of EGFR TKI, n (range)	2 (0-6)	C797S	28 (21)
NSCLC subtype, n (%)		cMet amplification (≥6 copies) ^d	10 (8)
Adenocarcinoma	139 (98)		
Squamous cell carcinoma	3 (2)		

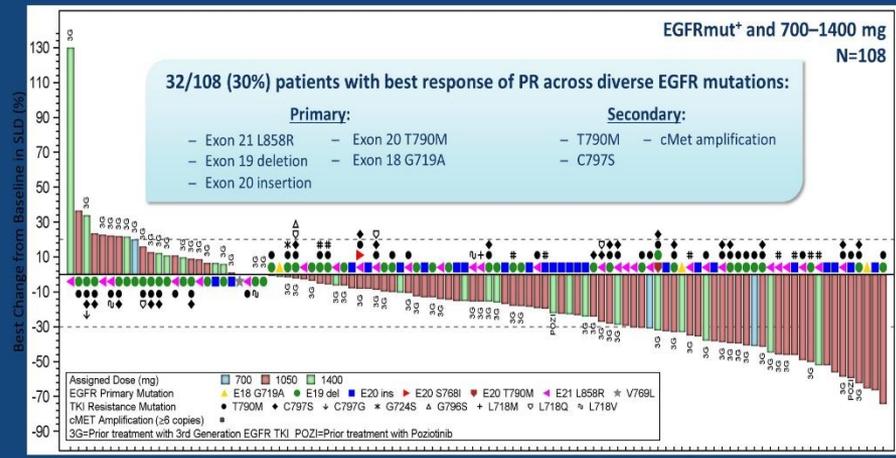
^aPatients could be counted in more than one category; ^bFor each mutation, percentages are calculated with number of patients with primary EGFR mutation as denominator (n=131); ^cTKI resistance based on historical or central testing; ^dcMet amplification defined

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Results – highlights



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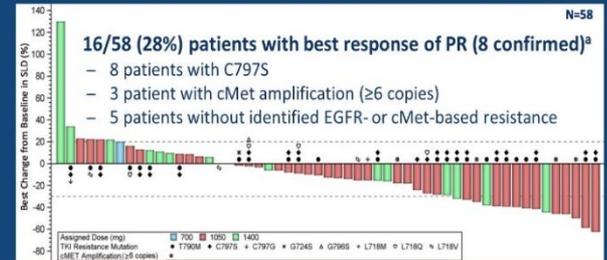
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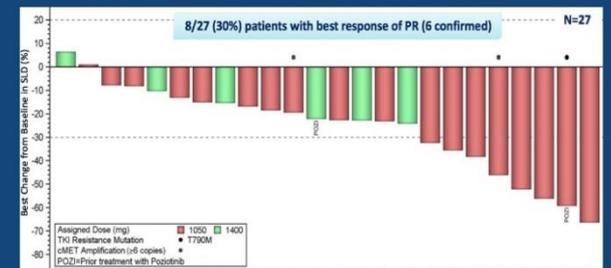
6 patients had best overall response of PD and non-evaluable target lesion measurements or new lesions in the first postbaseline assessment and are not included in the plot but are included in the N; SLD-sum of target lesion diameters

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Post 3GTKI:
RR 28%



exon20ins:
RR 30%



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Clinical trials - EGFR + cMET inhibitors ... the world of TKIs

Population	Drugs	Met-selected?	Result
EGFR-mutant, TKI resistant NSCLC	Erlotinib + tivantinib ¹	no	ORR 6.7% (3/45 patients) 3 responders: + Met IHC, + HGF
	Gefitinib + savolitinib ²	no	ORR 18% - (2/11) neither with MET amplification
	Gefitinib + capmatinib ³	Yes	ORR 29% ORR 47% in highest MET GCN
	Gefitinib + tepotinib ⁴	Yes	ORR 33%
	Osimertinib + savolitinib ⁵	Yes	Prior 1 st /2 nd gen: ORR – 52% Prior 3 rd gen: ORR 25%

1. Azuma et al ESMO Open 2018. 2. Yang et al ASCO Meet Abstr 2016. 3. Wu et al JCO 2019. 4. Wu et al ASCO Meet Abstr. 2016. 5. Sequist et al AACR 2019

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Conclusions

- JNJ-372 activity observed across diverse EGFR-mutated NSCLC, including those with unmet need
 - Patients with EGFR C797S-mediated resistance to 3GTKI (osimertinib)
 - Patients with cMet-mediated resistance to 3GTKI (osimertinib)
 - Patients with TKI-naïve Exon20ins disease
- JNJ-372 has a manageable safety profile consistent with EGFR inhibition
 - Low ≥Grade 3 toxicity rate (9%)
 - Frequent IRR, but primarily limited to first dose (C1D1)
- 1050 mg and 1400 mg currently being explored as RP2D
- Enrollment of patients with high unmet need is ongoing (NCT02609776)

Safety and preliminary antitumor activity of U3-1402, a HER3-targeted antibody drug conjugate, in EGFR TKI-resistant, EGFRm NSCLC

Pasi A. Jänne¹, Helena Alexandra Yu², Melissa Lynne Johnson³, Conor Ernst Steuer⁴, Michele Vigliotti⁵, Corinne Iacobucci⁵, Shuquan Chen⁵, Channing Yu⁵, Dalila Sellami⁵

¹Dana-Farber Cancer Institute, Boston, MA; ²Memorial Sloan Kettering Cancer Center, New York, NY; ³Sarah Cannon Research Institute, Nashville, TN; ⁴Winship Cancer Institute of Emory University, Atlanta, GA; ⁵Daiichi Sankyo Inc., Basking Ridge, NJ

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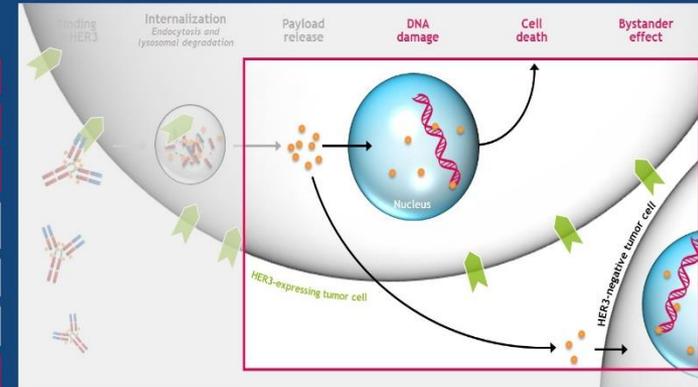
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U3-1402, a Novel Antibody Drug Conjugate Designed to Target HER3 Expression in EGFR-mutant NSCLC

U3-1402 Design Features

- Payload MOA: Topo I Inhibitor
- High potency of payload
- High drug-to-antibody ratio (~8:1)
- Payload with short systemic half-life
- Stable linker-payload
- Tumor-selective cleavable linker
- Bystander effect



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U3-1402 Phase 1 Dose Escalation and Expansion Study

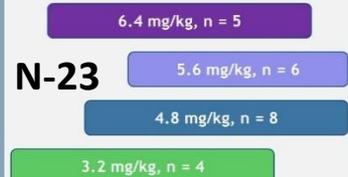
Eligibility

- Metastatic/unresectable EGFR-mutant NSCLC and:
- T790M-negative after progression on erlotinib, gefitinib, or afatinib; OR
- Progressed on osimertinib

Stable brain metastases allowed
Pretreatment tumor tissue (after progression on TKI) required for retrospective analysis of HER3 expression

Dose Escalation^a

Received ≥1 dose of U3-1402 IV Q3W: N = 23



Ongoing n = 16

Discontinued^b n = 7

Dose Expansion

Will enroll additional patients at the recommended dose for expansion

Study Objectives

Primary: Safety and tolerability of U3-1402

Secondary: Antitumor activity of U3-1402

Exploratory: Biomarkers of U3-1402 antitumor activity

Data cutoff of February 25, 2019. ^aDose escalation was guided by the modified continuous reassessment method with escalation with overdose control. Additional doses may be added. ^bReasons for discontinuation included progressive disease per RECIST v1.1, n = 5; clinical progression (definitive clinical signs of disease progression, but did not meet RECIST criteria), n = 1; and adverse event, n = 1. clinicaltrials.gov NCT03260491.

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Baseline Characteristics of Patients Treated with U3-1402

Baseline clinical characteristics	Dose escalation (N = 23) ^a	Baseline disease characteristics	Dose escalation (N = 23) ^a
Age, median (range), years	63.0 (51.0–80.0)	Sites of metastases, n (%)	
Sex, n (%)		CNS ^c	14 (60.9)
Female	14 (60.9)	Liver	9 (39.1)
Male	9 (39.1)	Lung	4 (17.4)
Race, n (%)		Tumor stage, n (%)	IV 23 (100.0)
White	13 (56.5)	Sum of diameters of target lesions, median (range), mm	69 (20–143)
Asian	7 (30.4)		
Black or African American	1 (4.3)		
Other	2 (8.7)		
ECOG performance status, n (%)		Baseline molecular characteristics	Dose escalation (N = 23) ^a
0	9 (39.1)	HER3 expression ^d	
1	14 (60.9)	Evaluable patients ^e	n/n (%) 19/19 (100.0)
Prior therapies, n (%)		Membrane H-score ^f median (range)	193 (150–290)
Any EGFR TKI	23 (100.0)	EGFR mutation ^g , n (%)	
Osimertinib ^b	21 (91.3)	Ex19del	13 (56.5)
Chemotherapy	10 (43.5)	L858R	9 (39.1)
		L861Q	1 (4.3)

Data cutoff date of February 25, 2019. ^aSafety analysis set included all patients who received ≥1 dose of U3-1402. ^bAdditional subject with prior osimertinib reported after snapshot date, not shown. ^cIncludes brain and spinal metastases as reported by investigators. ^dBased on central analysis of tumor tissue collected prior to first dose of U3-1402. ^eIncludes patients with tumor samples that have completed retrospective analysis. ^fMembrane H-score is a composite of percentage of positively staining cells and intensity of individual cell staining. For patients with multiple H-scores, the highest number was used. ^gAs reported locally by the investigator.

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Results – highlights

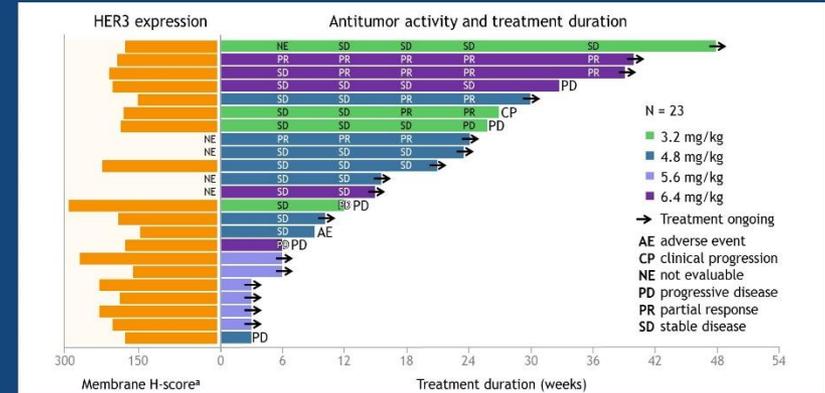


Data cutoff date of February 25, 2019. Dotted lines denote 20% increase and 30% decrease in tumor size. Sixteen patients received ≥1 dose of U3-1402 and had pre- and post-treatment evaluable tumor assessments. ^aLocal testing as reported by the investigator. ^bPerformed centrally using OncoPrint Comprehensive assay v3 from formalin-fixed, paraffin-embedded tumor tissue.

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U3-1402 Treatment Duration



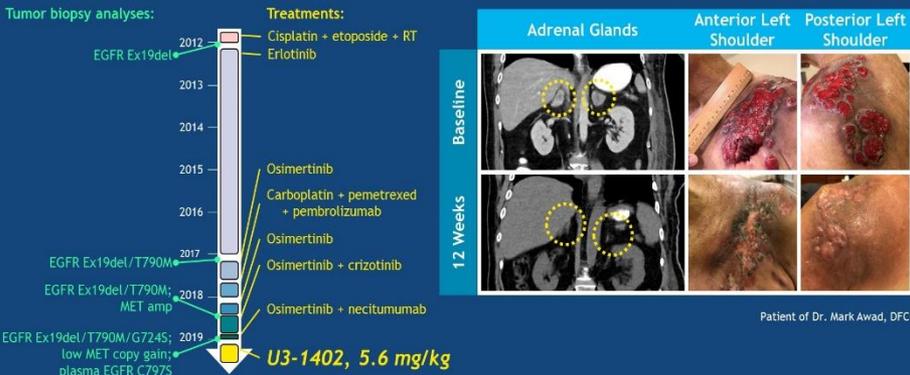
Data cutoff date of February 25, 2019. Safety analysis set included all patients who received ≥1 dose of U3-1402. ^aMembrane H-score is a composite of percentage of positively staining cells and intensity of individual cell staining. Scores range from 0-300. For patients with multiple H-scores, the highest number was used.

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U3-1402 Patient Case

65-year-old male NSCLC patient



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Conclusions

- U3-1402, a HER3 ADC, displayed a manageable safety profile in this phase 1 study
 - The majority of TEAEs were grade 1 or 2 events
 - The majority of discontinuations were due to progressive disease (n = 5); only 1 patient discontinued due to an AE, and there were no TEAEs leading to death
 - DLTs were grade 4 platelet count decreased (n = 4) and grade 3 febrile neutropenia (n = 1)
- Antitumor activity with U3-1402 was observed in patients with EGFR-mutant TKI-resistant NSCLC, with a median follow-up of 4.2 months
- The 5.6 mg/kg dose cohort is ongoing, and a dose expansion is planned for Q3 of 2019

Targeting HER3 with U3-1402 may be a practical approach to treat EGFR-mutant NSCLC with diverse mechanisms of resistance to EGFR TKIs

Data cutoff February 25, 2019.

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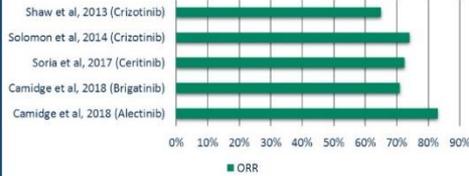
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Revertir resistencia a ALK y ROS1

Background: ALK TKIs

NSCLC with ALK rearrangement

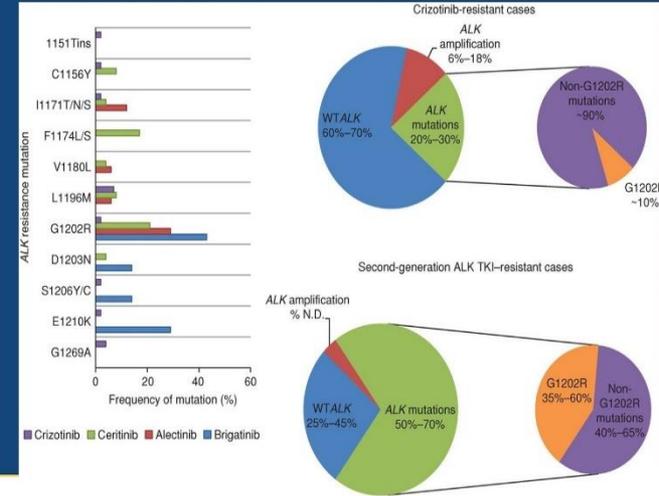
OBJECTIVE RESPONSE RATE



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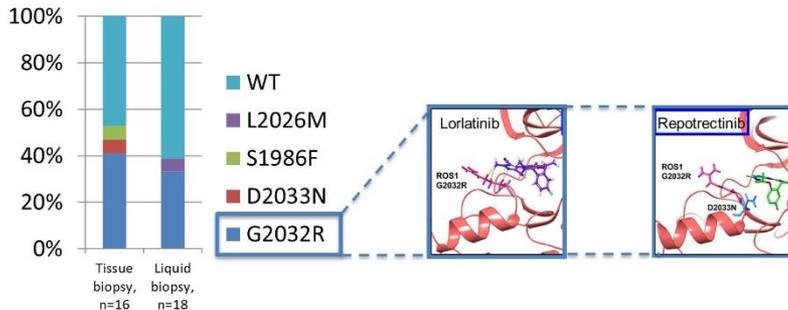


Acquired resistance to ALK inhibitors



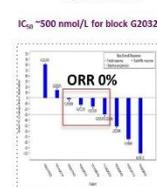
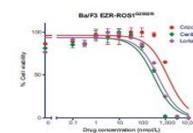
Secondary mutations in ROS1

ROS1, ~50% 2nd mutations



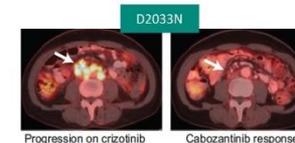
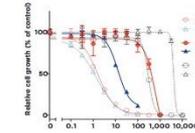
ROS1 TKI against G2032R

Lorlatinib



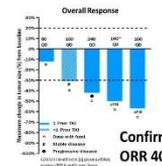
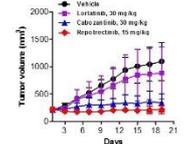
Adapted from J.Remon

Cabozantinib



NCT01639508 ph II ongoing in RET / ROS1 / NTRK fusions

Repotrectinib



Safety and Preliminary Clinical Activity of Repotrectinib in Patients with Advanced ROS1 Fusion-Positive Non-Small Cell Lung Cancer (TRIDENT-1 STUDY)

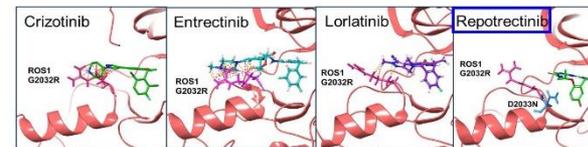
Young Chul Cho,¹ Alexander Drilon,² Robert C. Doebele,³ Dong-Wan Kim,⁴ Jessica J. Lin,⁸ Jeeyun Lee,⁵ Myung-Ju Ahn,⁵ Viola W. Zhu,⁶ Samuel Ejadi,⁶ D. Ross Camidge,³ Y. Juliet Liu,⁷ Shanna Stopatschinskaja,⁷ J. Jean Cui,⁷ David M. Hyman,² Sai-Hong Ignatius Ou,⁶ Alice T. Shaw⁸

¹Yonsei Cancer Center, Severance Hospital, Yonsei University College of Medicine, Seoul, Republic of Korea; ²Memorial Sloan Kettering Cancer Center, Weill Cornell Medical College, New York, NY, USA; ³University of Colorado Denver, Anschutz Medical Campus, Aurora, CO, USA; ⁴Seoul National University Hospital, Seoul, Republic of Korea; ⁵Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Republic of Korea; ⁶Chao Family Comprehensive Cancer Center, University of California Irvine School of Medicine, Orange, CA; ⁷Turning Point Therapeutics Inc, San Diego, CA, USA; ⁸Massachusetts General Hospital, Harvard Medical School, Boston, MA, USA

Targeting ROS1 Fusion Positive Non-Small Cell Lung Cancer

- ROS1 rearrangement is an oncogenic driver in 1-2% of NSCLC
- Crizotinib is the only approved targeted therapy for patients with advanced ROS1+ NSCLC
- G2032R is the most common ROS1 resistance mutation after crizotinib treatment¹
- **Repotrectinib is a next-generation ROS1/TRKA-C/ALK inhibitor, designed to overcome TKI resistance mutations, especially solvent front ROS1 G2032R²**

Repotrectinib is a Small, Rigid Macrocycle Designed to Overcome the ROS1 G2032R Solvent Front Mutation



CD74-ROS1 Ba/F3 Cell Proliferation IC₅₀ (nM)*

ROS1	Crizotinib	Ceritinib	Cabozantinib	Entrectinib	Lorlatinib	Repotrectinib
WT	14.6	42.8	0.5	10.5	0.2	<0.2
G2032R	266.2	1391	11.3	1813	160.7	3.3

*Data based on evaluation of comparable proxy chemical reagents purchased from commercial sources except repotrectinib

¹Sainor JF et al., JCO Precis Oncol 2017
²Drilon A et al., Cancer Discov 2018

N-33

TRIDENT-1 Design

Study Design/Eligibility (Phase 1)

- Advanced solid tumors harboring ROS1/NTRK1-3/ALK fusions
- No limit on prior lines of therapy
- Asymptomatic CNS metastases allowed

Phase 1 Primary Objective

- Determine the MTD and RP2D

Phase 1 Secondary Objectives

- Safety and tolerability
- Preliminary objective response rate and clinical benefit rate

	Number of patients per dose cohort									Total
	40 mg QD	80 mg QD	160 mg QD	240 mg QD	160 mg BID	200 mg BID ¹	120 mg QD w/ Food	160 mg QD w/ Food	160 mg QD/BID w/Food ²	
Safety population (ROS1+, NTRK1-3+, ALK+ solid tumors)	13	12	23	10	12	2	3	5	3	83**
Efficacy population (ROS1+ NSCLC)	5	5	10	2	6	0	2	3	0*	33

¹ 2 ALK patients enrolled

² 160 mg QD for one week followed by 160 mg BID

* Not yet evaluable for efficacy by BICR

** N=83 patients: 31 were ALK+, 9 were NTRK+, and 43 were ROS1+ (of which 33 ROS1+ NSCLC were evaluable for efficacy by BICR)

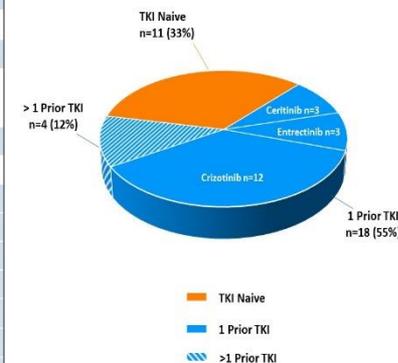
BICR: Blinded Independent Central Review

TRIDENT-1: ROS1+ NSCLC Patient Demographics

Characteristics	N=33
Age, median (range)	57 (30, 79)
Sex, female n (%)	23 (70)
Race, Asian n (%)	20 (61)
Median lines of prior systemic therapy (range)	2 (1, 8)
Prior chemotherapy, n (%)	28 (85)
CNS metastases at baseline n (%)*	18 (55)
Median # of prior ROS1 TKIs (range)	1 (0, 3)
TKI Naive, n (%)	11 (33)
TKI Pretreated, n (%)	22 (67)
1 prior TKI	18 (55)
Crizotinib only	12 (67)
Ceritinib or entrectinib	6 (33)
>1 prior TKI	4 (12)

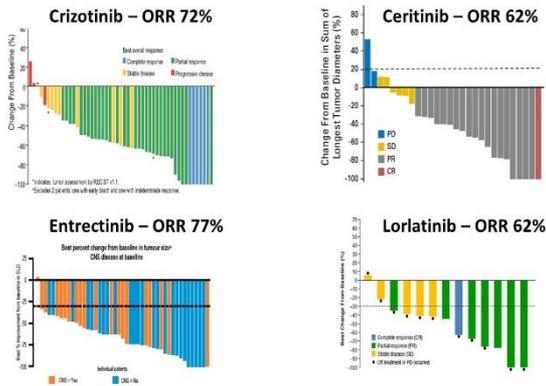
*Assessed by Investigator

Distribution of Prior ROS1 TKIs



Repotrectinib (TRIDENT) Fase 1

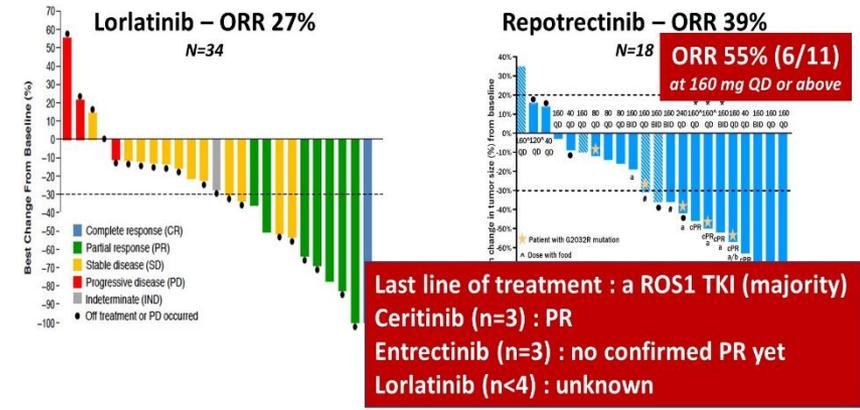
ROS1 inhibitors in TKI naive patients



Repotrectinib – ORR 82%

- ✓ High ORR but small n
- ✓ Dose doesn't impact ORR
- ✓ PFS not available
- ✓ Efficacy vs. ROS1 fusion partner unknown

ROS1 inhibitors in TKI pretreated patients



Besse – ESMO 2017 *Ou – WCLC 2018 * Solomon – ESMO 2018

Lim JCO 2017, Barlesi ELCC 2019
Shaw ELCC 2019, Cho ASCO 2019

2019 ASCO ANNUAL MEETING #ASCO19
PRESENTED BY: Benjamin Besse, Besse ESMO 2017, Ou WCLC 2018, Solomon ESMO 2018, Cho ASCO 2019

Safety Summary: Treatment-Emergent and Treatment-Related AEs

Adverse Event	All Treated Patients (N=83)				
	TEAEs (≥10% of patients)		TRAEs		
	All Grades n(%)	Grade 3 n(%)	Grade 4* n(%)	Grade 3 n(%)	Grade 4 n(%)
Dizziness	47(56.6)	2(2.4)	---	2(2.4)	---
Dyspnea	25(30.1)	5(6.0)	1(1.3)	1(1.2)	---
Fatigue	25(30.1)	2(2.4)	---	---	---
Constipation	24(28.9)	---	---	---	---
Paresthesia	24(28.9)	---	---	---	---
Anemia	23(27.7)	10(12.0)	---	3(3.6)	---
Nausea	19(22.9)	2(2.4)	---	---	---
Cough	17(20.5)	---	---	---	---
Pyrexia	16(19.3)	---	---	---	---
Headache	14(16.9)	1(1.2)	---	---	---
Vomiting	13(15.7)	---	---	---	---
Upper respiratory tract infection	11(13.3)	---	---	---	---
Ataxia	10(12.0)	---	---	---	---
Pain in extremity	10(12.0)	1(1.2)	---	---	---
Abdominal pain	9(10.8)	---	---	---	---
Muscular weakness	9(10.8)	1(1.2)	---	---	---

- ✓ TRK inhibition? Lack of taste
- ✓ Marginal weight gain (6% all grade)
- ✓ Four DLT events:
 - ✓ Grade 2 or 3 dizziness
 - ✓ 160 mg BID (n=2)
 - ✓ 240 mg QD (n=1)
 - ✓ Grade 3 dyspnea and hypoxia
 - ✓ 160 mg BID (n=1)
- ✓ Recommended dose UNKNOWN yet

*Add'l Grade 4 TEAEs: cerebrovascular accident, dyspnea, influenza, hyperkalemia, bacterial pneumonia (n=1 each), respiratory failure (n=2); None were determined to be related to treatment
 *Grade 5 TEAEs: respiratory failure (n=2), sepsis, sudden death (n=1 each); Only the case of sudden death was determined to be possibly related to treatment

Conclusions

- TRIDENT-1 Phase 1 data support repotrectinib as a potential best-in-class ROS1 agent in advanced NSCLC
- Preliminary clinical activity demonstrated across 7 dose cohorts in ROS1+ NSCLC patients
 - TKI-naive:
 - cORR 82% (9/11); median DOR not yet reached
 - TKI-pretreated:
 - 1 prior TKI: cORR 39% (7/18)
 - cORR 57% (4/7) in crizotinib-pretreated patients at 160 mg QD and above
 - CNS activity observed in both TKI-naive and TKI-pretreated patients
- Repotrectinib is a next-generation ROS1/TRKA-C/ALK inhibitor designed to overcome TKI resistant mutations
 - All 5 ROS1+ NSCLC patients with the G2032R SFM experienced tumor regressions with a cORR of 40%
- Repotrectinib was well tolerated with a manageable safety profile
 - Dizziness is an on-target AE associated with TRK inhibition and manageable
 - Most AEs managed without dose modification and rarely led to discontinuation
- Pivotal Phase 2 portion of TRIDENT-1 planned to initiate in 2H 2019